

**Bangor University**

## **DOCTOR OF PHILOSOPHY**

### **The effects of integrating reading strategy training into the university English foundation course in Thailand**

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*Award date:*  
2007

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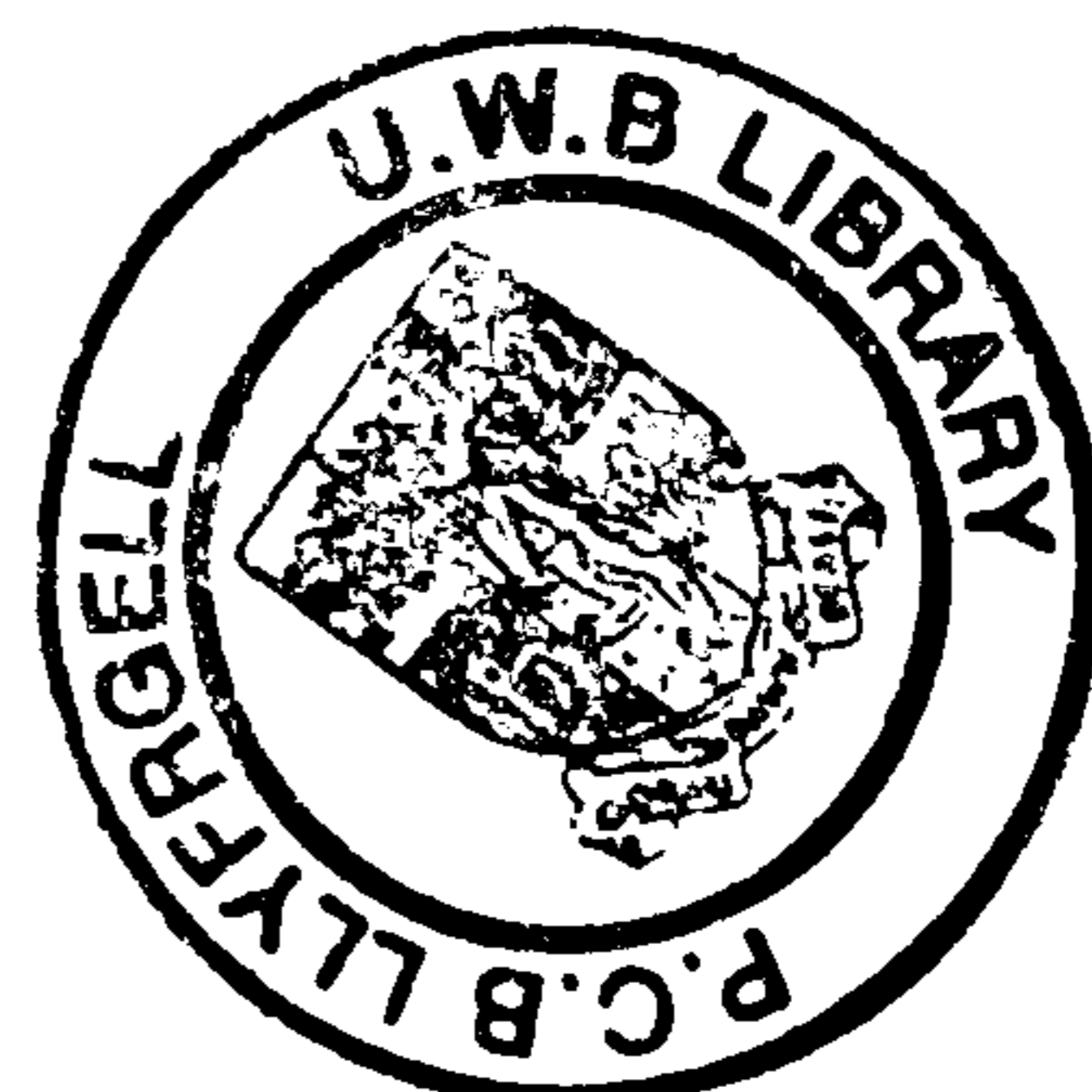
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**THE EFFECTS OF INTEGRATING READING  
STRATEGY TRAINING INTO THE UNIVERSITY  
ENGLISH FOUNDATION COURSE IN THAILAND**

**PATTAMA SAPPAPAN**

**A thesis submitted in candidature for the degree of  
Doctor of Philosophy  
University of Wales, Bangor**

**June, 2007**



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## ACKNOWLEDGEMENTS

Conducting a study is one of the most worthwhile experiences I have had and it would have been impossible without the support and help from particular institutions as well as a number of people who have helped me with this long and slow process.

First of all, I would like to express my sincere gratitude to the Royal Thai Government who has generously sponsored me throughout the period of my study.

As a first-time researcher, things have never seemed easy as I moved along through the different stages of the research procedure. I would like to express my sincere gratitude to my supervisor, Dr. Eddie Williams, for the academic and moral support he kindly provided all along the continuum. He was always there to give me guidance and useful pieces of advice. His helpful comments and constructive suggestions have made it possible for me to continue and finish this thesis.

I would also like to thank Assoc. Prof. Dr. Pratin Pimsarn, the Director of the Language Institute, Thammasat University, who was generous in permitting my study leave which might have put a heavy teaching load on other staff at the Language Institute. Special thanks to all my colleagues whose names I cannot list in full for the overload they might have endured during the period of my absence. This study would not have been accomplished without the contribution of the first-year students who were engaged in both my pre-pilot, pilot phases and the research itself.

I am also grateful to the staff at the English Language Intensive Course for Overseas Students (ELICOS) at the University of Wales, Bangor, in a number of ways. First, I would like to express my gratitude and appreciation to Ms Debbie J. Garlick for her kind assistance in proofreading all of my thesis chapters. Second, I would like to thank Ms Penny J. Drower and Mr Desmond Burton who assisted me in my early stages while I was developing my research tools.



Friendship plays an important role in giving me a balance between academic and social aspects during my study in Bangor. I wish to thank a very good friend of mine, Ms Margaret Griffiths, who also considers herself as an ‘international’ British person living in Wales. Without her generosity, I would not have been able to see so much of Wales and understand so much more about the British way of life.

Also special thanks to Mr Preecha Ongprasert, who broadened my perspectives of what the world outside this ‘city of learning’ looks like as well as influencing me to improve my culinary skills in many ways. Thanks to those friends who helped turn those long and hard times into cheerful and memorable ones. Thanks to you all: Nayla, Maria, Dan, Joe, Maggie, Lot, Celso, Dylan and Sha.

Last but not least, I would like to thank my family members and friends in Thailand for their moral support and encouragement during the times I needed it most through those ups and downs. I would especially like to thank my two sisters, brother, sister-in-law, and my little niece who constantly motivated me to work hard so that I could be reunited with them as quickly as possible.

## ABSTRACT

This study investigates the effects of integrating reading strategy training into the English Foundation Course in Thammasat University, Thailand. The study aims to explore if reading strategy training has effects on students' reading proficiency. Sixty first-year students were split up equally into an experimental and a control group in which two different teaching approaches: firstly, strategy training and secondly, text-based training were applied during eight reading sessions throughout one academic term. Results of pre- and post-tests were used to compare the effects of both types of teaching approaches. In addition, strategy questionnaires, think-aloud verbal reports and reading logs were collected before and after the instruction periods in order to compare the use of reading strategies between the experimental and control groups as well as two groups of high- and low-scoring readers.

Results of post-tests and questionnaires suggested that the experimental group made significant improvements. After data from think-aloud protocols and reading logs were analysed, categorisations of reading strategies were proposed. Data based on think-aloud verbal reports and reading logs also indicated that the students in the experimental group used reading strategies at a higher rate in comparison with the control group. However, after differences in mean score over time between the two groups were compared, data showed a marginal decline in the frequency of strategy use in the experimental group. This may suggest that the students in the experimental group were more selective in choosing more appropriate reading strategies to be used and, therefore, this group needed to utilise fewer strategies in their reading. Distinctive patterns of strategy use between high- and low-scoring readers could be seen.

Implications drawn from these findings suggest that reading strategy training can be successfully integrated into a real classroom setting and yield positive results in improving students' reading capacity in ESL/EFL contexts.



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# Chapter 1

## Introduction to the Study

### 1.1 Introduction

English is generally considered to be the global language and is widely used as a language of communication in many countries throughout the world (Crystal, 2003). In the era of globalization, it has been regarded as the international language of the present time (Baker, 2003) as well as “the dominant language of world communication” (Crystal, 2002, p. 7).

In Thailand, the role of English is significant in both academic and social contexts (Wiriyachitra, 2002). This is in line with Wongsothorn, Sukamolsun, Chinthammit, Ratanothayanonth, and Noparumpa (1996) who point out that among foreign languages, English is the most widely taught foreign language in Thai schools and universities. According to O’Sullivan and Tajaroensuk (1997), English is the most significant foreign language which is taught in schools starting straight away from the first year. For those students who wish to pursue higher education, the English proficiency test is one of the core requirements in their university entrance examination apart from Thai.

English is also regarded as the “language to be used for international communication” and has its place in various contexts including business, tourism and mass media (Wongsothorn et al., 1996, p. 89). A sound knowledge of English is also required for high-ranking positions in private firms (Foley, 2005; Smyth, 2001).

As can be seen, English has an eminent status in Thailand and proficiency in English provides not only opportunities but also access to the latest technology and communication. Moreover, sound knowledge in English is viewed as the key factor leading to professional advancement (Foley, 2005; Wongsothorn et al., 1996). As Smyth (2001, p. 343) explains, “Thais have a very positive attitude towards learning English. Competence in the language is seen as both a mark of sophistication and a passport to a more prosperous life”.



Among the four language skills which are of listening, speaking, reading and writing, reading is considered to be the most important (Carrell, 1990b). This is supported by Paris, Lipson, and Wixson (1998, p. 803) who state, “Learning to read is a sign of literacy and a gateway to education.” As revealed by Cyrstal (2003, p. 106), “Most of the scientific, technological, and academic information in the world is expressed in English, and over 80 per cent of all the information stored in electronic retrieval systems is in English”. Regarding second language reading, Anderson (1999, p. 1) strongly believes that, “With strengthened reading skills, ESL/EFL readers will make greater progress and attain greater development in all academic areas.”

At the tertiary level, the students are required to read extensive academic materials for their assignments. Reading teachers are, therefore, left with the question of what can they do to help their students to improve their academic reading skills and to develop their vocabulary skills as well as maximize their comprehension rate so that they become more proficient readers (Jamtawee, 2000).

There are no easy or absolute answers to the question raised above. A number of teaching approaches have been proposed and a great deal of reading research has been carried out. Research on successful language learners has revealed that language learners use a number of strategies to help them when having difficulties with their language learning. These special techniques or strategies can be isolated and taught to less successful students (Rubin, 1975; Stern, 1975; O’Malley & Chamot, 1990). Applied to teaching and learning practice, teaching second language readers to use strategies is beneficial and helpful for them.

To quote from Wenden (2002, p. 36), “Therefore, teachers are encouraged to help students learn to use learning strategies – to attend to incoming information to be learned, comprehend it, and to store and retrieve what is learned.”

Language learning strategies are believed to play a significant role in differential success among second language learners (Ehrman, Leaver & Oxford, 2003; Larsen-Freeman & Long, 1991; Cook, 1991; Mitchell & Myles, 1988). Although age, aptitude, intelligence, learning style, cognitive styles as well as affective variables have been claimed to contribute to success in learning to a certain degree, many of these factors cannot be manipulated by the teacher (Cook, 1991).



It has been agreed that the use of learning strategies helps to facilitate the process of language learning and improve learners' proficiency (Chamot & O'Malley, 1994; Cohen, 1998; Ehrman et al., 2003). Effective learners know how to make use of learning strategies more often and in an orchestrated manner. This is supported by Chamot and O'Malley (1994, pp. 386-387),

Another general conclusion is that high school and university-level ESL and foreign language learners can, with appropriate support, integrate learning strategies instruction into their classrooms, and that students who report higher levels of learning strategy use also indicate a higher level of confidence in their ability to successfully complete a language learning task.

## **1.2 Background Information of the Study**

As the study was carried out in a Thai academic setting involving Thai first-year university students, background information relating to the study regarding Thailand as well as English Language Teaching (ELT) in Thailand is relevant to establish the context of the study.

In order to give an overview of the Thai educational system from general to more specific, some facts and figures about Thailand are provided in Section 1.2.1, which is then followed by a brief overview of the education system in Thailand in Section 1.2.2. The issues concerning the teaching of English in Thailand and more specifically in the Language Institute, Thammasat University where the researcher is currently working, are to be discussed in Section 1.2.3 and Section 1.2.4 respectively.

### **1.2.1 General Information on Thailand**

Thailand is situated in South-East Asia, occupying an approximate land area of 513,119.5 square kilometres. It is bordered by the Union of Myanmar (Burma) in the north and west, Laos People's Democratic Republic in the north and north-east, Cambodia in the east, and Malaysia in the south (National Statistical Office, 2002).



Thailand is divided into 4 geographical regions, namely, Northern Thailand, Northeastern Thailand, Central Thailand, and Southern Thailand and consists of 76 provinces, with Bangkok as its capital. Thailand is governed under a constitutional monarchy in which King Bhumibol Adulyadej (Rama IX) is the head of state.

According to the National Statistical Office (2006), the total population of Thailand is 65.38 million. Although the majority of the population is Thai, the country consists of other nationalities including Chinese, Myanmars, Loatians, Khmers as well as Muslims who are concentrated largely in provinces in the southern part of Thailand. Moreover, in a large city like Bangkok, communities of Hindus and Sikhs can also be found (Office of the National Educational Commission, 1997).

Although most of the Thai citizens are Buddhists (94.2 per cent), other practicing religious groups include Islamists (4.6 per cent) and Christians (0.8 per cent), with the rest being Confucious or Hindus (National Statistical Office, 2002, p. 25).

There is only one official language in Thailand which is Standard or Central Thai (McKay, 1992). However, distinct dialects are spoken in different regions of Thailand, namely the north, the northeast, and the south. Other languages widely spoken in certain parts in the country include Chinese, Malay, Lao and Khmer. Across the country, Central Thai is also used as the medium language of instruction in schools and universities. The literacy rate in the 15 year old and over bracket is high at approximately 92.6 per cent, while the male literacy rate is higher, at 94.9 per cent, with females slightly lower at 91.4 per cent (National Statistical Office, 2002, p. 25).

In spite of the fact that there is no official second language in Thailand, English has a high status and is considered to be “the most important foreign language” as the language for international communication (Wongsothorn et al. (1996, p. 89) and it is the only language that is taught as a compulsory subject in schools (Foley, 2005).

Thailand is currently undergoing the Ninth National Economic and Social Development Plan (2002-2006) which is a series of strategic and economic plans to be used as a framework as well as guidelines for national development. According to the National Economic and Social Development Board (2001, p. i),



In the Ninth Plan, major emphasis is placed on balanced development of human, social, economic, and environmental resources. A priority goal is pursuance of good governance at all levels of Thai society in order to achieve real sustainable people-centered development.

The significance of English in the development plan will be discussed in the next section.

### **1.2.2 The Education System in Thailand**

The current framework of Thai education has been influenced by the 1997 Constitution and the 1999 National Education Act regarding guidelines and directions in educational development. The 1977 Constitution helped to raise Thai people's awareness over the issues of their rights and contributions in politics, while new concepts regarding educational reform feature in the 1999 Act. According to Office of the Education Council (2004, pp. 15-16), some of the major provisions in the 1997 Constitution can be found in Section 81 and Section 43 which state that "the state will improve education to be in harmony with economic and social change" and that "all Thai people will have an equal right to receive basic education for at least 12 years, of quality and free of charge." Based on the latter provision, all Thai citizens now benefit from a 12-year free basic education.

Initiated by the 1999 National Education Act, Thailand has been in the process of transformation to cope with rapidly growing economic development in the 21<sup>st</sup> century. In accordance with the 1999 Act and the 2002 Bureaucratic Reform Bill, Thai educational administration and management has undergone some bureaucratic changes following the merger of the three agencies of Ministry of Education, the Ministry of University Affairs, and the Office of the National Education Commission into one Ministry, the Ministry of Education (MOE). The MOE is currently responsible for all levels and types of education in Thailand (Office of the Education Council, 2004, pp. 37-39).

Under its administration and management at central level, the MOE consists of five main bodies which can be briefly listed together with their responsibilities as follows:



1. The Office of the Permanent Secretary is responsible for managing general administrative works; coordinating activities within the Ministry, performing other official functions mandated by law.
2. The Office of the Education (OEC) is responsible for proposing the National Education Plan which integrates religion, art, culture, and sports into all levels of education.
3. The Office of the Basic Education Commission (OBEC) is responsible for proposing policies, development plans, standards, and core curricula for basic education.
4. The Office of the Higher Education Commission (OHEC) is responsible for proposing policies, development plan, and standard for higher education.
5. The Office of the Vocational Education Commission (OVEC) is the main organization responsible for technical and vocational education and training in Thailand.

(Office of the Education Council, 2004, pp. 38-39)

With the aim of promoting education and turning Thailand into a learning society in which people at all ages and levels can continue their lifelong learning, the education system is divided into three main categories of: firstly, formal education, secondly, non-formal education, and finally, informal education (Office of the Education Council, 2004). In the following discussion, the emphasis will be placed on the first category of formal education as the most relevant to the current study.

Formal education including both public and private sectors covers all services provided in schools and is divided into two main broad categories: basic education and higher education. With some modification based on the Office of the Education Council report (2004, p.22), the level of education, students' approximate age and equivalent grade in levels of pre-primary to higher education can be summed up as follows:

**Table 1.1      Organization of the Thai Grading System**

<b>Level of education</b>	<b>Approximate age</b>	<b>Grade equivalency</b>
Pre-primary education	3-6	-
Primary education	6-12	1-6
Lower secondary education	13-15	7-9
Upper secondary education	15-18	10-12
Higher education	19-24	13-18



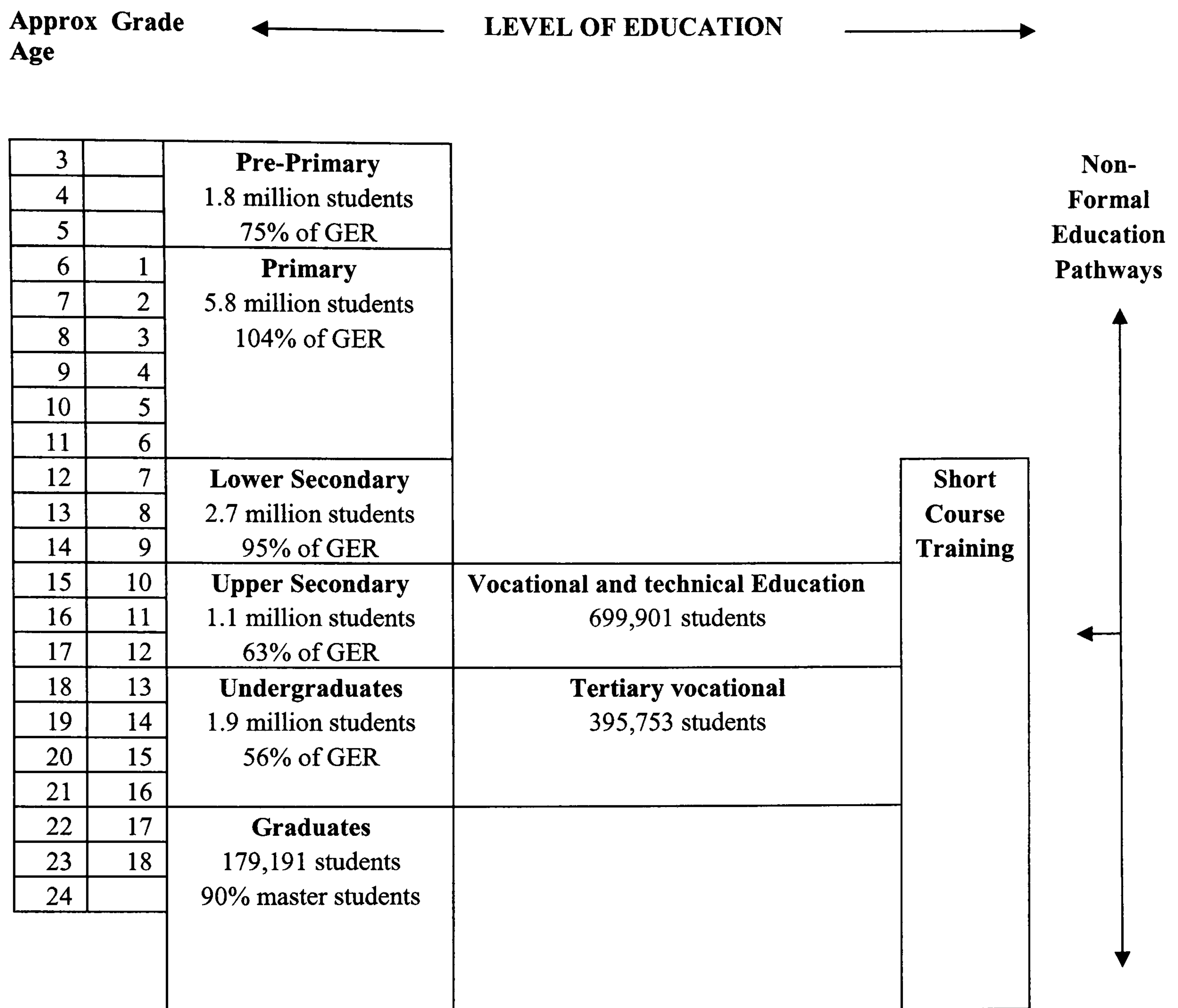
With reference to Table 1.1, basic education covers 3 years of pre-primary education, 6 years of primary education, 3 years of lower secondary education, 3 years of upper secondary education, and 4-6 years of higher education before a bachelor's degree can be obtained. Previously, compulsory education covered 6 years of primary education (Grades 1-6). However, as stipulated in the 1999 National Education Act, compulsory education now covers a period of 9 years including 6 years of primary education and another 3 years of lower secondary education (Grades 7-9).

As for higher education, it is divided into two levels of associate degree or diploma levels and degree levels. Higher learning is generally provided in universities, colleges or institutions. In general, it takes two years to complete at the level of associate degree or diploma level. At this level, the courses generally involve vocational or teacher education and apart from being offered in colleges and institutions, some can be found in dramatic art and fine art colleges as well as colleges of physical education (Office of the Education Council, 2004, p. 21). However, it is also possible to continue at graduate level after completing the diploma courses by continuing with study for another two years.

It generally takes 4-6 years of study for students who finish grade 12 and want to pursue degree courses before they obtain the first professional qualification or a bachelor's degree. This depends largely on student's individual field of study. For example, five years of study are required for those students in the fields of architecture, graphic arts or pharmacy, while those in the fields of medicine, dentistry or veterinary science require six years to complete their study (Office of the Education Council, 2004, p. 23). As revealed by the Ministry of Education (2006), there was a sharp rise in the number of students who enrolled in the 2005 academic year to 14.4 million students aged from 3-21 years old, representing an 82 per cent Gross Enrollment Rate (GER), compared to that of 75 per cent in 2001.

With reference to the Ministry of Education figures (2006), an overview of how the Thai education system is organized in combination with the 2005 figures is presented in Figure 1.1.



**Figure 1.1 The Thai Education System**

*Note:* Gross Enrolment Rate (GER) is measured by the percentage of students in the age group in education

According to Figure 1.1, there were approximately 1.8 million students of the age between 3 to 5 years who attended pre-primary education resulting in a total of 75 per cent of GER, while the GERs for primary education reached 104 per cent and 95 per cent for lower secondary education with respectively high numbers of 5.8 and 2.7 million students in the year 2003. The higher figures of 5.8 and 2.7 million students in primary and lower secondary levels, when compared to the total number of 1.1 million students in upper secondary level, are due to the new extension of compulsory education to 12 years (Ministry of Education, 2006).



The numbers of students in upper education (1.7 million students) are divided into 1 million students who stayed on at the upper secondary level and around 700,000 students who moved into vocational education. There were approximately 2.2 million students in higher education with a significant rise to 40 per cent of application rates when compared to those of 26 per cent in previous years. The rising figures are in accordance with the vast increase in the number of public universities and private higher education institutions (Ministry of Education, 2006). The total number of students in higher education, which reached over 2 million, was divided into 1.9 million undergraduates, 400,000 students who were studying in tertiary vocational education and around 200,000 postgraduates, 90 per cent of whom were master students.

Thailand is now engaged in a 15-year National Education Plan (2002-2016) which was prepared by the Office of the Education Council (OEC). The plan has a major role to play as a key framework for further development regarding all aspects of basic education, vocational education, higher education, art and culture. Its ultimate aim in transforming Thailand into a learning society is reflected through three main objectives which propose to: firstly, lead to a knowledge-based economy and society; secondly, promote continuous learning; and thirdly, involve all segments of society in designing and decision-making concerning public activities (Office of the Education Council, 2004, p. 19).

### **1.2.3 English Language Teaching in Thailand**

Demands for the study of foreign languages have resulted from the economic boom which has taken place since the 1980's bringing more contact with foreign firms and the need for individuals to improve their language communication skills. Since then, English has become not only "a tool to gain access to modern technology" but also "the key to professional advancement" (Wongsothorn et al., 1996, p. 95).

Apart from English, some of the other foreign languages that are also offered in the Thai Education system include French, German, Spanish, Chinese, Japanese, Pali and Sanskrit. However, English has gained most popularity among foreign languages. McKay (1992, p. 35) notes about the role of English in Thailand that, "English has no particular status in the country; officially it is considered to have equal status with other foreign languages. In reality, however, it has a very special



role”. This view is supported by Wongsothorn et al. (1996) who point out that, “Only English is taught in most language classes at all class levels (p. 95).

Foley (2005, p. 224) states that the teaching of English in Thailand can be traced back to King Rama III who reigned during the period from 1824 to 1851 although it was limited to higher court officials and administrators. However, its significance was not realised in Thai education until 1921, when English became a compulsory subject for students after Grade 4. English gained further popularity with an increasing focus on international communication although the teaching method emphasised rote learning and grammar translation to the extent that the introduction of an audio-lingual method at a later stage was not well received. In later years, between 1977 and 1980, new concepts in language teaching as well as the new ‘communicative approach’ brought many changes to the national curriculum (Foley, 2005).

The significance of English has been realised in bureaucratic policies and plans, such as the National Economic and Social Development Plans, the National Education Acts and Plans. Thananart (1996, p. 68) notes that, “Since the teaching of English was first introduced, English has never dropped in its importance within Thai society.” In accordance with the Eighth National Economic and Social Development Plan (1997-2001) and the 1996 English curriculum, English has been made compulsory from grade 1 onwards. The purpose of the 1996 curriculum is to “provide Thai students with the opportunity to continue their English learning without interruption from primary to secondary education” (Wongsothorn et al., 1996, p. 95).

The teaching of English at schools is divided into four levels. As pointed out by Foley (2005), Level 1 in primary education serves as a Preparatory Level (grades 1-3), while Level 2 marks the Beginning Level (grades 4-6). Level 3 is considered to be the Expansion Level (grades 7-9) with the period in Level 4 classified as the Progressive Level (grades 10-12).

Various attempts have been made to push the teaching and learning of foreign languages, especially English, in a more “communicative” direction through a number of schemes, such as, the English Programme (EP) and mini-EP programmes. They are carried out with the main aim of integrating the use of English as a full or partial Thai national curriculum subject (Ministry of Education, 2006).



According to Foley (2005, p. 225), the new English curriculum is based on the four concepts of culture, also known as the 4Cs which are Culture, Communication, Connection and Communities. The new curriculum has set out approximately 800-1000 sessions (20-30 minutes each) for students at primary level, while a higher number of 1200 sessions (50 minutes each) is required for those at secondary level. Foley (2005) points out that the national curriculum basically provides standards, guidelines, and formal assessments for all subjects except English where English teachers have the freedom to choose their own course materials in addition to teaching methods. However, the teaching is expected to reflect real-life situations from students' own communities as much as possible.

Another dramatic change has also taken place at the higher education level in both public and private universities. Under the new curriculum, undergraduates who choose to take English as their language subject are required to earn 12 credits in English courses with six credits in Foundation English courses 1 and 2 and others in English for Academic Purposes (EAP) or English for Specific Purposes (ESP) courses as specified by a particular major subject (Wiriyachitra, 2002). At this higher level of study, more emphasis is also placed on independent work, autonomous learning, and self-access learning (Foley, 2005). This is in line with Wiriyachitra (2002) who believes that in addition to the use of Information Technology (IT) and the Internet, self-access learning centres have a crucial role to play in English language teaching and learning at the university.

Regarding core or elective English courses, Wiriyachitra (2002) points out they revolve around the three objectives of "knowledge, skill, and a positive attitude towards English"; details of these objectives are described as follows:

Knowledge involves how to use English language in communication, learning and understanding the culture of native speakers, knowing the differences between Thai and the English language, being able to use English to gain information in other subjects, being able to use English to do lifelong learning, to find pleasure and to use it in their work. Skill involves communication strategies, thinking skills, critical and creative thinking, self-evaluation, learning skills, knowledge seeking skills, technology skills and how to work with others. A positive attitude includes appreciating the English language and its culture.

Wiriyachitra (2002, p. 6)



Teacher development is one of the important aspects that needs to be monitored as part of educational reform. Through several projects, English teachers should have an opportunity to attend some form of training every two years in order to be updated regarding their professional development in addition to current teaching methodologies (Wiriyachitra, 2002). Some of regional and international bodies that provide training include SEAMEO Regional Language Centre in Singapore, the British Council, USIS, and ThaiTESOL.

#### **1.2.4 English Language Teaching at the Language Institute, Thammasat University (LITU)**

Thammasat University was founded in 1933, and was originally known as the University of Moral and Political Sciences. Its main objective was to teach the principles and application of democracy to the public especially those who were political leaders or civil servants. This resulted from the 1932 Revolution which brought about a change to constitutional monarchy and the adoption of the parliamentary democracy (Ministry of University Affairs, 1992). This makes Thammasat University the second oldest university in Thailand. Since its foundation in 1933, it has expanded into fifteen faculties as well as a graduate school of wide-ranging strands of arts, humanities and sciences.

Undergraduate courses which are offered at Thammasat University include Commerce and Accountancy, Dentistry, Economics, Engineering, Journalism and Mass Communication, Law, Liberal Arts, and Medicine (Thammasat University, 1999). Graduate programs offered at master's level include Accounting, Business Administration, Marketing, Economics, Law, History, Library Science, Mass Communication, Political Science, Social Work, Sociology, Anthropology, Thai, Linguistics, Industrial and Organizational Psychology, Applied Statistics, Community Development, and English Language and Literature. Some of the graduate programmes are offered in both Thai and English, e.g., master degrees in Economics, while a doctoral programme in Business Administration was initiated in 1993 as a joint venture programme between Thammasat University, Chulalongkorn University and the National Institute of Development Administration (Thammasat University, 2001).



Thammasat University consists of four main centres; two of which are the original campus, Tha Prachan which is based in Bangkok, and the other campus in Rangsit, Pathumthani Province. This study was conducted mainly on Rangsit Campus, where the researcher is currently working. The Language Institute of Thammasat University (LITU) was established in 1985. Its status is practically equivalent to a department or faculty. Its main responsibilities are to provide English training courses for general and academic purposes at both undergraduate and graduate levels. The courses and services offered by LITU include:

1. Foundation English courses at remedial, intermediate and advanced levels
2. English for Specific Purposes courses for 2<sup>nd</sup> - 4<sup>th</sup> year undergraduates (including: English for the Airline Business, English for Work, English for Banking and Finance, English for Lawyers I & II, and English for Science and Technology I & II.)
3. Remedial English courses for graduate students
4. Graduate programmes in: English for careers and Teaching English as a Foreign Language
5. English refresher courses for Thammasat University personnel as well as participants from other government and private agencies.
6. English courses for the general public
7. Testing services including the Thammasat University Graduate English Test (TU-GET) which is required for those who seek admission to any of the graduate programmes offered at Thammasat University.

(Thammasat University, 1996, pp. 13-14)

Based on the LITU annual report in 2002, there were 42 Thai full-time lecturers and 22 Thai and foreign part-time lecturers (Language Institute, Thammasat University, 2003). Most of the Thai staff holds master's or doctoral degrees in the fields of Linguistics or Teaching English as a Foreign Language, and the majority have either studied or attended some training courses abroad (Somphong, 2001).

Each Thai academic term generally consists of a 16-week period. The first term lasts from June to September, whereas the second term continues from October to February. Moreover, it is also possible for students to enrol in some courses which are available during the summer term from March to May.

After being admitted into Thammasat University under a central university admissions system, first-year students are generally required to take 12 credits (4 courses) in language courses together with other general courses. Generally, most students enrol in Thai and English courses (3 credits each) in two consecutive terms in their first year. However, there are some exceptions for students in some faculties.



For example, students in the Faculty of Engineering are only required to complete 6 credits in their English Foundation Courses (Somphong, 2001).

The Language Institute offers 3 English Foundation Courses at three levels: lower, pre-intermediate and intermediate. The formal course titles are Remedial English Foundation Course (EL 070), English Foundation Course I (EL 171) and English Foundation Course II (EL 172) respectively. The time allocation for each course is 2 periods of 90 minutes a week.

Moreover, some of the English courses run by LITU are in the area of English for Specific Purposes (ESP). These courses are compulsory for particular students in their second to fourth years. The contents of these courses are, however, in accordance with their fields of studies. For example, the students in the Faculty of Economists require to enrol in both English for Economics I and II and the same applies to the students in the Faculty of Political Science as they need to enrol in English for Political Scientists I and II.

However, students in some faculties are required to enrol in the first part of the course, while the second half is left as an elective. This applies to the students in the Faculty of Science and Technology and the Faculty of Journalism and Mass Communication as it is compulsory for them to enrol in English for Science and Technology I and English for Mass Communication I respectively, while English for Science and Technology II and English for Mass Communication II are elective courses (Somphong, 2001).

All English Foundation courses for first-year students are carried out at Rangsit Campus. Due to the great demand for English Foundation Courses, the Language Institute requires an adequate number of instructors, teaching materials as well as other facilities. According to the 2002 LITU annual report, there were 3,766 students who were enrolled in 3 Foundation Courses (EL 070, EL 171 and EL 172) and divided into 113 individual classes (Language Institute, 2003).

However, the level of the English Foundation Course each student is required to take depends on their English Entrance Examination (EEE) scores regarding their English proficiency. Students with low scores have to begin from the Remedial Course and work their way up to through English Foundation Courses I and II, while some with higher scores are only required to do English Foundation Course II. With some modification the criterion scores based on Somphong (2001, p. 27) can be interpreted into a table format as follows:



**Table 1.2 Criterion in Placing Students in the English Foundation Course**

<b>Range of score based on English Entrance Examination</b>	<b>Classified English level of proficiency</b>	<b>Course title</b>
Below 30	Low	EL 070
31-52	Pre-intermediate	EL 171
53-69	Intermediate	EL 172
Above 70	Advanced	-

Based on Table 1.2, it can be seen that only those students who are in the first three categories (low, pre-intermediate, and intermediate) are required to enrol on Foundation Courses, while those whose scores are above 70 are considered to be an advanced group, and are, therefore, exempt from taking an English Foundation Course.

Both English Foundation Courses I and II aim to improve students' competence in the use of English so that they can develop their proficiency in social and academic use. The two main goals are to enable students to use English, firstly, to communicate in social settings both inside and outside classroom contexts and secondly, to achieve their personal and academic goals as well as to promote life-long learning. Also relevant is the fact that the use of learning strategies have been recognized and included in aims under both goals. For example, a statement under the first aim mentions, "Students will use appropriate learning strategies to extend their communicative competence", whereas "Students will use appropriate learning strategies to acquire, construct, and apply academic knowledge and to develop critical thinking skills" is specified as one of the statements under the second goal.

The textbooks to be used in the English Foundation Courses are mainly developed by the staff at the Language Institute. Although their contents may vary in accordance with the targeted levels of the students, each unit covers basic language skills in reading, writing, listening, and speaking and is generally based on the following format. The theme of each chapter is generally introduced through a main reading excerpt, which is then followed by a reading skill exercise and related vocabulary in focus. A specific grammar point in each unit is then highlighted which also lends itself to a writing task. Each unit generally finishes off with thematic-based listening and speaking activities.



Among the four integrated skills, reading has the most important part to play in actual teaching. This is in line with a study by Thananart (1996, p. 69) who reveals that reading has been considered by the majority of instructors in the study as “the most important skill in learning English” and that the materials to be used in English courses should reflect this view.

To promote extensive reading, the students in Foundation Courses are assigned to read two short novels each term. They are considered to be part of the assessment as students have to answer questions about the stories they read in their mid-term and final exams. These novels have been carefully selected by the staff to match the students’ level of proficiency as well as their areas of interest. Some of the novels chosen for the students in the academic year of 2003/2004 included: *Dangerous Game*, *Falling Leaves*, *1984*, and *The Talented Mr. Ripley*. Although they are simplified versions, these novels can serve as tools to motivate students to read for pleasure and form good reading habits outside the classroom.

To facilitate learner independence, a Self Access Learning Centre (SALC) was established at Rangsit Campus in 1997 specifically to serve the needs of those students enrolling in Fundamental English Courses in their first year. Some of the SALC general objectives are “to facilitate learning flexibility according to individual differences and to provide learners with a variety of self-access learning materials” (Suriyatham, 2004, p. 6). The objectives share some similarities with those suggested by Wiriyachitra (2002) in that the use of SALC should help to provide students with opportunities to further practice their language skills outside the classroom context in response to their own needs, abilities, and interests, as well as to promote students’ autonomous language-learning skills so that they can contribute to their life-long learning processes in their future studies as well as careers.

The learning activities at SALC are provided in four different rooms: SALC 1, SALC 2, SALC 3, and SALC 4. The learning activities in SALC 1 aim to build students’ skills in reading through the use of the materials both developed by the staff at LITU and commercially produced, e.g., SRA/McGraw-Hill reading materials. Moreover, there are also exercises to help develop writing skills in English graded according to levels of difficulty. Some other reading materials include a selection of English magazines and newspapers for the students to choose from.



The learning activities in SALC 2 mainly focus on language learning through the use of computers. Students can practice their English skills through using language CD-ROMs or surfing the Internet.

To incorporate entertainment, SALC 3 provides a number of choices for students. They can practice their listening skills through watching a wide range of movies or language learning videos based on some commercial materials including: *Follow Me*, *Family Album U.S.A.*, *Hello America*, and *Look Ahead*. Moreover, some space has been set aside so that they can play English-based games such as Scrabble, Rich Game, Crossword, Speller Game, 20 Questions, the Australian Game, as well as the Oxford Game or they can have a choice of practising their speaking in pairs or groups.

Finally in SALC 4, students can improve their pronunciation through commercial audio cassette tapes, develop their listening skills through listening to English songs or watching cable TV programmes.

In each semester, the students enrolling on English Foundation Courses are required to make use of these facilities in their own time. They can choose to work on the skills that need to be improved most. After that, they need to submit a portfolio which consists of writings reflecting their learning at the end of the term.

To sum up, the staff at the Language Institute, Thammasat University, has responsibilities to provide English training in a number of courses in a variety of schemes ranging from English Foundation Courses, English for Academic Purposes (EAP) to English for Specific Purposes (ESP). In all courses, the staff is encouraged to base their teaching on the communicative approach. Moreover, with more focus on a learner-centred orientation, instructors are encouraged to use a variety of teaching materials as well as learning activities, such as, songs and games, to maximize learning potential while maintaining students' interest at the same time (Somphong, 2001). The surveys of students' opinions regarding learning and teaching practice conducted at the end of each academic term usually yield highly satisfactory results.



However, a crucial point raised by Wiriyachitra (2002) is that there is more that needs to be done to make teaching English in Thai universities meet the specific needs for English used in the workplace. As suggested by Foley (2005), in order to cope with rapid change, teaching materials, methods and focus of teaching need to be constantly updated. With the era of IT technology, more modes of learning can be undertaken through web-based English lessons and with computer-based resources; whereas the knowledge of grammar can be presented in contexts closer to real use.

### **1.3 Rationale of the Study**

At Thammasat University, the researcher's current main responsibility is to teach on English foundation courses for undergraduate students during their first year. Although as previously mentioned, the English Foundation Programme is aimed at three different levels of students' English proficiency: low-, pre-, and intermediate, the current study was conducted at the intermediate level or EL 172.

In a typical classroom, each class consists of 35 to 40 students who come from a variety of fields. Although they are grouped according to their English proficiency based on the entrance examination, their reading skills vary within the same class. The foundation course tends to be intensive and the teachers cannot provide a great deal of practice during the reading hours due to time constraints. As they are at tertiary level, the students will be required to read extensively using English texts, articles, or journals in their own field, such as, accounting, economics, social sciences, science or engineering on their undergraduate courses.

Some of the problems during reading lessons are that the students' ability to read and understand English texts is rather low and they also have different abilities regarding reading speed and proficiency. In spite of a number of reading skills being taught throughout the course, the students' scores in reading comprehension do not show much improvement.

However, the majority of students are generally highly motivated to improve in their overall language skills. In response to one of the open-ended questions in a reading questionnaire which asked, "Do you think learning how to read effectively will be useful to you in your future studies? Why?", the majority of the students agreed that reading is one of the most important skills, as reflected by some of their answers:



- Reading is basically a crucial skill to learn, as important as listening. This is because both skills help you to become educated, broaden your vision, and enrich you with useful experiences.
- Knowing how to read efficiently leads to a complete acquisition of knowledge.
- Reading is an opening door leading to the learning of other language skills.
- Reading makes me become more knowledgeable.

In spite of their awareness of the significance of reading, what worries the researcher most is that after finishing the foundation course, these students are less likely to receive further training to improve their English proficiency. The researcher's main concern is that these students are not well prepared for the upcoming tasks even after they complete the foundation courses. Without good background in reading proficiency, students might not be able to perform at the levels they must achieve in order to succeed (Carrell, 1990b) so they need to be provided with learning tools which they can make use of by themselves even when they are not attending English classes. Although the students' low performance in reading may derive from different sources, such as lack of vocabulary, poor reading habits in their first language, or ineffective use of reading skills, none of these problems can be solved within a short period of time.

It is possible that one of the solutions to this problem is to give these students reading strategy training so that they can receive training in their individual learning contexts. By developing some appropriate conscious awareness of how reading strategies can help them to read more effectively, they will gradually adopt the strategies and turn them into effective tools for their lifelong learning.

To quote Anderson (1999, p. 43): "What makes the reader a good reader is that he/she has developed the strategies and skills through intensive reading that are then transferred to extensive reading contexts."

The main focus of this study is therefore, to explore how strategy-orientated approaches for reading instruction can improve students' reading comprehension. This type of actual classroom training has received little attention from prior research on strategy training. The results of this study will lead to some practical suggestions on how reading strategies can be incorporated into English Foundation Programme in the Thai university context.



## **1.4 Overview of the Study**

In order to give an overview of the study, its aims, objectives, hypotheses and research questions are given in detail as follows.

### **1.4.1 Aims and Objectives**

This study aims to explore an alternative teaching approach to reading comprehension at higher education level. The study will, first, investigate current types and frequencies of reading strategies used by the students in the study. Secondly, it will integrate reading strategy training into the experimental group, while regular teaching of reading will be carried out in the control group.

After that, the effect of the strategy instruction on the students' reading proficiency based on their reading comprehension scores will be compared between the two groups. Finally, the types and frequencies of reading strategies used over time by the students in both groups will be examined and compared.

The findings based on the current research should help to shed some light on reading strategies employed by second language readers as well as the effects of reading strategy instruction on students' reading proficiency.

### **1.4.2 Research Questions**

The current research aims to answer the following research questions:

1. What are the reading strategies the students in the experimental and the control groups use when reading English texts?
2. Is there any relationship between the students' level of reading proficiency and the types and frequencies of reading strategies reported?
3. What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?
4. Does strategy training help the students in the experimental group to improve their reading proficiency significantly?
5. Do the students in the control group benefit from the usual approach to teaching reading in improving their reading proficiency?
6. To what extent do the students at different levels in both groups benefit from the two different teaching approaches?



### **1.4.3 Significance of the Study**

The study is carried out in a natural EFL classroom setting in order to explore the effects of strategy instruction among Thai undergraduates enrolling in the English Foundation Course II (EL 172) at Thammasat University, Thailand. The students in both experimental and control groups are originally placed according to the level of their proficiency based on a set of scores they obtained from the central English Entrance Examination scores.

As revealed by Wiriyachitra (2002), in the future, all Thai universities will adopt the same criteria on placing first-year students to English Foundation Courses 1 and 2, this suggests that students' groupings will not vary across universities making cross reference among different levels of proficiency more valid. As the students in the study are representatives of Thai students at intermediate level, the findings based on these groups can also be applicable to those students in the same level of English proficiency across universities.

It is hoped that the study will reveal how reading strategy training can be integrated into English Foundation Courses and what benefits it may have in enhancing reading comprehension on the students' part. The findings based on a reading strategy questionnaire and think-aloud verbal reports should help to reflect the nature of reading strategies of Thai university students and contribute to knowledge not only for EFL reading teachers in Thailand but also for the understanding of second language reading in a wider context.

### **1.4.4 Scope and Limitations of the Study**

It should be noted that the subjects in this study involve Thai undergraduate students enrolling in their English Foundation Course II (EL 172) at the Language Institute, Thammasat University. At the intermediate level, the students come from different disciplines including Law, Commerce and Accountancy, Economics, Engineering, Journalism and Mass Communication, Law, and Liberal Arts.



The period in which the research was carried out and data were collected was in the second academic term between November 2004 and February 2005. The experimental study was conducted using the time frame and the content of the reading classes with the experimental and control groups and was based on the two sets of teaching methods as developed and specified in the study.

The findings on reading strategies are mainly based on a reading strategy questionnaire, whereas think-aloud verbal reports are based on the texts provided by the researcher. The reading strategies are drawn from reading logs derived from the students' own choice of selected texts.

As research findings can be interpreted differently in different contexts, details provided about the characteristics of the students who took part in the study as well as the research tools involved should help to reveal the scope of the study and the extent of the implications.

## **1.5 Conclusion**

This chapter provided some general and specific background related to the study from a number of aspects. First, it highlighted the significant role English plays in Thai social and educational contexts. Second, it discussed some general information regarding Thailand as well as providing an overview of the Thai education system, followed by a brief introduction to English language teaching in Thailand, and specifically to English language teaching carried out at the Language Institute, Thammasat University, where the current study took place. The requirements to carry out the current study were then discussed. Finally, relevant information regarding aims and objectives, research questions, the significance of the study, and the scope and limitations of the study were presented.

Chapter 2 provides a literature review, while Chapter 3 discusses the methodology and the research tools used in the study. The main findings from quantitative and qualitative aspects are presented in Chapter 4 and Chapter 5 respectively, followed by a discussion of the main findings in Chapter 6.



## **Chapter 2**

### **Literature Review and Related Studies**

This chapter outlines key concepts in reading literature and related studies that form the major part of the study. First, it begins by discussing reading models, their implications for the teaching of reading as well as relevant research. Second, the framework of language learning strategies and language learning strategy training are introduced. Next, it discusses how both concepts can be applied within the pedagogies of reading strategies and reading strategy training and this investigation forms the main foundation of the current study. Finally, the framework of think-aloud verbal reports is outlined together with their strengths and limitations, followed by related research.

#### **2.1 Key Concepts in Reading Comprehension Processes**

Meanings of reading have been defined by many reading experts over decades. As defined by Mitchell (1982), reading is “the ability to make sense of written or printed symbols. The reader uses the symbols to guide the recovery of information from his or her memory and subsequently uses this information to construct a plausible interpretation of the writer’s message” (p. 1), whereas Rayner and Pollatsek (1989, p. 23) point out that, “Reading is the ability to extract visual information from the page and comprehend the meaning of the text.” Both definitions suggest that reading is a complex process involving subcomponents during the reading process initiated by the reader so that the information of what is being read gets interpreted and understood.

Reading can be viewed as cognitive activity as it takes place in the mind involving physical activities, such as eye movements and subvocalisation and has been a subject of interest for cognitive psychologists since the 1960s (Urquhart & Weir, 1998). Some of the reading models proposed by cognitive psychologists include the bottom-up and top-down models with the most recent being the interactive model.



As this study focuses mainly on the teaching of reading, it is necessary to understand how the different models of the reading process have been developed together with their related research. Rayner & Pollatsek (1989) consider bottom-up, top-down and interactive models to be “characteristic not only of the reading process but of the descriptions of most of the tasks and phenomena that cognitive psychologists typically investigate” (p. 25). These models have also been classified under the umbrella term of “process models” in which descriptions involved in the reading process are provided in detail (Urquhart & Weir, 1998, p. 39).

In order to understand the key principles of reading models as well as their implications for the teaching of reading, each of the reading models mentioned above will be discussed in the following sub-sections. Moreover, as the notion of the readers’ background knowledge plays an important role during the reading process, the discussion of the schema theory is also included.

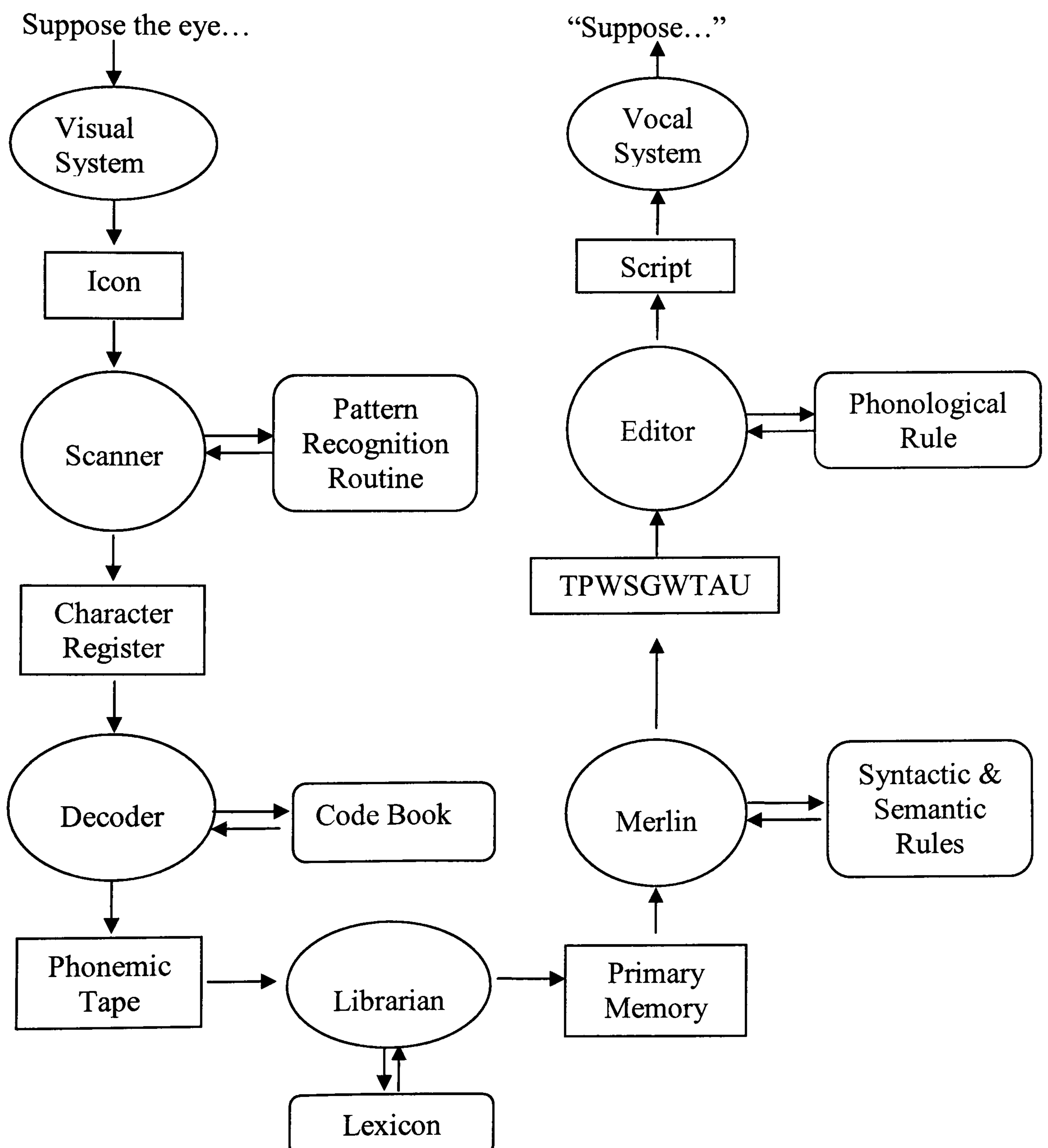
### **2.1.1 The Bottom-Up Models**

In bottom-up processing models, the emphasis is placed on text-based features at word and sentence level (Wallace, 2001). Readers have to work their way up from decoding the smallest text unit, represented by letters, other letter features and words to form meaning (Anderson, 1999; Hedge, 2000; Urquhart & Weir, 1998). Bottom-up models are also referred to as “data-driven models” (Anderson, 1999, p. 2). Nuttal (2000, p. 17) describes the readers’ role as building up “a meaning from the black marks on the page: recognizing letters and words, working out sentence structure.” The way the meaning is built up from letter features to letters to words to meaning is considered to be lower-level processing (Anderson, 1999).

Rayner and Pollatsek (1989) point out that, in general, the processing in bottom-up models is quick and goes through strict sequential stages in such a way that the chance of it being influenced by other sources, such as contextual information or readers’ general world knowledge are minimal. According to Rayner and Pollatsek (1989), the model proposed by Gough (1972) which follows has been considered to be the most comprehensive and influential.

According to Gough (1972), reading is a complex process and involves a number of stages. Most of the information flows passively in a series of stages within the information processing system. In Gough's model, the cycle of the reading process first begins with an eye fixation in which the information is taken in. After that, a reader's eyes remain fixed for a certain period of time, and then sweep to the right and this is when a new eye fixation takes place again. Gough (1972, p. 345) describes the sequential events of the reading process during the first second of reading and represents the flow of information in a detailed diagram as follows.

**Figure 2.1 Gough's Reading Model**





In Gough's model, the input or graphemic information goes through different devices in a sequential order. In brief, the information which consists of letters first enters the visual system and moves along an icon. After being recognised by a scanner, these letters are operated on by a pattern-recognition routine. They are then converted from character-level representation into phonemic representation through a decoder. The phonemic strings are matched up and transformed into a string of systematic phonemes before they are fed into primary memory. With the help of syntactic and semantic representation, the input is processed and forwarded to store in TPWSGWTAU which is short for "The Place Where Sentences Go When They Are Understood" (Gough, 1972, p. 340).

Gough's model in processing input is viewed as totally "bottom-up" by Rumelhart (1998) and Urquhart & Weir (1998) due to the fact that readers have to convert lower-sensory information (letters and words) into higher-level encodings (sentences). Rumelhart (1998, p. 867) comments that, "The processing at any level can directly affect only the immediately higher level." In addition, there is no room for interaction within the system during the reading process. This is supported by Rayner and Pollatsek (1989, p. 25) who state that the information in Gough's model flows in a passive manner as the "knowledge we have stored in memory has little impact on how the processing takes place." Urquhart & Weir (1998) and Mitchell (1982) perceive Gough's model to be a model of the reading aloud process.

Although Gough's model has stimulated a number of studies on reading, many of its weaknesses have also been revealed by this research. Some of the limitations raised by Rayner and Pollatsek (1989) include the facts that Gough's model has no provision for dealing with letters that are processed on more than one fixation and that not all letters are processed in a serial left-to-right fashion. Moreover, the model does not give much information on how eye movements are controlled in reading nor does it cater for other aspects of processing through eye movements. Most importantly, the model lacks flexibility and leaves readers with no freedom to choose appropriate operations to deal with different types of reading tasks (Mitchell, 1982).



Another information processing model has been developed by LaBerge and Samuels (1974). In this model, visual information is transformed through three different stages of memory systems; visual, phonological and semantic. Each operates different functions. The visual memory system holds representations of letters and words, while phonological representations of spelling groups, words, and word groups are held in the phonological memory system. The semantic representation of the words, word groups, and sentences are dealt with by the semantic memory system.

Mitchell (1982) points out that the key aspect of the LaBerge-Samuels model is that the processing of letters and words is not automatic for beginner readers who are required to focus their attention according to the different kinds of reading task which is demanded of them. According to LaBerge and Samuels (1974), “The processing which occurs at each stage is assumed to be learned and the degree of this learning is evaluated with respect to two criteria: accuracy and automaticity” (p. 293). At the accuracy level, attention is required for processing, but once the automaticity level is reached, attention is no longer required. Therefore, certain operations can be carried out by fluent readers without much attention due to considerable practice.

The LaBerge-Samuels model has been reviewed by Rumelhart (1998, p. 868), as “a strictly bottom-up process” as reading is processed in a series of stages from lower to a higher level. The basic sequence starts from “features to letters, to spelling patterns, to visual word representations to phonological word representations to word meanings to word-group meanings”. Moreover, the LaBerge-Samuels model does not say much about comprehension, whilst the issue of the control of the eye movements is neglected (Mitchell, 1982)

Neither the Gough model nor the LaBerge-Samuels model is comprehensive enough to describe the whole reading process (Rayner & Pollatsek, 1989; Rumelhart, 1998) although Gough’s model has been given credit as “it made clear predictions, predictions that could be tested – and have been” (Rayner & Pollatsek, 1989, p. 467).



### 2.1.2 The Top-Down Models

In top-down processing, the contribution of readers' knowledge and experience plays an integral part in enabling them to derive the meaning of the text (Hedge, 2000). Contrary to bottom-up models in which a reader works their way up from the bottom level, the meaning of the text in top-down processing is constructed from the "top" level where the flow of information is controlled (Rayner & Pollatsek, 1989, p. 461). Nuttal (2000, p. 17) describes a reader's way of processing the text as adopting "an eagle's eye view of the text" while taking into account his or her own knowledge and experience".

This type of knowledge is known as a "schema" which allows readers to relate new knowledge to existing world knowledge they already have (Anderson, 1999; Wallace, 2001). Urquhart and Weir (1998, p. 42) see the reader's role as "crucial, even dominant" and describe these models as "reader-driven". This results from the belief that the reader brings hypotheses with him or her and based on the information of the text, the reader's hypotheses are confirmed or denied. It is also known as a "hypothesis-testing" model (Rayner & Pollatsek, 1989, p. 26).

The two best-known top-down models are the ones proposed by Goodman (1967) and Smith (1971). Goodman (1990) is opposed to the bottom-up view of the reading process in which readers are assumed to go through sequential stages of recoding graphic input as aural input and then decoding and states that it does not reflect proficient reading.

Goodman (1990) views reading as a receptive language process which involves an interaction between language and thought. According to Goodman, "The writer encodes thought as language and the reader decodes language to thought" (p. 12). This explains why he describes reading as a "psycholinguistic process" (Goodman, 1973, p. 22) in which the reader tries to reconstruct the message encoded by a writer during the reading process. The reader does so by making use of his or her experience, language competence as well as the information gleaned from the text to help with the understanding of the text. Using this view, Goodman (1998, p. 1114) points out, "Readers use the least amount of available text information necessary in relation to existing linguistic and conceptual schemata to get to meaning". Goodman also summarises the key characteristics of reading using the



psycholinguistic view as, “meaning seeking, tentative, selective, and constructive” (p. 1114).

The Goodman model was first developed from his experience in dealing with beginner L1 readers and later applied to the way proficient adults read. In his proposed model, the reader makes use of three different cue systems which are applied simultaneously during the process of reading.

Goodman’s cue systems are termed as: graphophonic, syntactic, and semantic (Goodman, 1973, p. 25). While the graphophonic cue system helps the reader with the knowledge of the visual and phonetic features of English, the syntactic knowledge which comes from the deep structure of written language can be inferred to help the reader arrive at meaning. The third cue system derives from the reader’s semantic input to predict and guess the meaning of words by the help of schematic knowledge. Both syntactic and semantic cues are very powerful and can be used very effectively by skilled readers while relying less on graphophonic knowledge (Wallace, 1992). Goodman claims that these three cue sources help the reader in dealing with unknown words or meaning while facilitating comprehension processes (Pearson & Stephens, 1998).

Smith (1971, 1973, 2004) is another key proponent who holds a psycholinguistic view of reading. According to Smith (1973), psycholinguistics helps to explain the reading process as well as present some guidelines of how reading should be taught in classroom. He feels strongly opposed to the view that reading is a straightforward process in which a reader simply decodes printed words into sounds.

Smith (1973) believes that “reading is not primarily a visual process” (p.6). In order to achieve understanding of the text, a reader requires both types of visual information and nonvisual information. While the visual information comes from the printed page, the nonvisual information is accessed through the reader’s prior knowledge. A combination of these two sides of reading is always involved while reading is taking place. The more the reader has from nonvisual knowledge, the less is required from visual information. In contrast, “the less nonvisual information the reader can employ, the harder it is to read (Smith, 2004, p. 74). This is because the reader will place too much emphasis on individual words and lose sight of the meaning.



Based on the set of beliefs about visual information, three implications for the teaching of reading can be drawn as follows: (1) reading must be fast, (2) reading must be selective, and (3) reading depends on nonvisual information (Smith, 2004, p. 86).

As explained by Smith (2004), if the reader reads too slowly, the words are perceived as isolated units rather than meaningful sentences resulting in not fully understanding. Also, due to limited memory in the brain, the reader needs to “sample the text” rather than to read indiscriminately (p. 87). Most importantly, when possible, the reader should make use of nonvisual information by setting up purposes and expectations as well as activating prior knowledge

Smith (2004) also strongly believes that people constantly predict, basing their predictions on the concepts they have about the world. They also do so when reading. Prediction is not a matter of wild guessing. Smith defines prediction as “the prior elimination of unlikely alternatives” (p. 25). Prediction has the value of facilitating the understanding of texts and making the experience found more comprehensible. He concludes, “Prediction is the core of reading” (Smith, 2004, p. 25).

Smith (1973) views the phonic approach as an inefficient way to teach children to learn how to read. This is because it relies on visual information which has certain restrictions against its spelling and sound relationships.

In contrast, Smith (1973) places an emphasis on teaching children reading for meaning aided by the use of nonvisual information. In his view, it is the natural way of how reading should be taught. He indicates, “Children clearly know so much about reading right at the beginning” (Smith, 1973, p. 8). Moreover, there are some similarities in the way how children and skilled adults go about reading in that they read for comprehension and skip unknown words with little attempt to sound out unfamiliar words they come across. Therefore, reading instruction should begin at the sentence level down to word level and letter identification should only be used as a last resort (Smith 1973).

Like bottom-up models, top-down models as well their key proponents receive both support and criticisms. Regarding the Goodman model, in which the reader has a role to play in constructing the meaning during the reading process, the model can also be viewed as an interactive model.



However, Rayner & Pollatsek (1989, p. 462) disagree with this view and point out that Goodman's model is a top-down model in its nature as it is largely influenced by bottom-up processing, while the interactions are limited.

Although top-down models are basically set to be opposed to bottom-up processing models, Urquhart & Weir (1998) cannot conceptualize the sequence of how a reader approaches the text as a whole before dealing with other smaller units ranging from paragraphs to individual words. As stated by Urquhart & Weir (1998, p. 42), "The term 'top-down' is deceptive, appearing to offer a neat converse to 'bottom up', a converse which in reality does not exist" (p. 42).

Some of Goodman's findings are also found to be contradictory in subsequent studies. For example, as pointed out by Goodman, children's reading behaviours involve a lot of guessing. Rayner and Pollatsek (1989) find the opposite as children rely more on the analysis of printed words after reaching the highest level of reading skill in their grades 4 or 5. Various studies prove that poor readers use context as much as good ones, while Goodman and Smith propose that only good readers learn to do so. Urquhart and Weir (1998) suggest that the difference between good and poor students is that good readers tend to decode more accurately and rapidly.

Some of the explanations given to the inconsistencies in these findings may result from the fact that Goodman's model was originally developed to account for children's reading behaviour, but he considers it a model of proficient reading as well (Rayner & Pollatsek, 1989). Oakhill and Garnham (1998) and Mitchell (1982) think that what is stated in the Goodman model is more accurate in describing beginning readers rather than fluent readers.

However, according to Pearson & Stephens (1998), the psycholinguistic view has influenced the field of reading in many ways. First, it encourages teachers to put more emphasis on reading for meaning rather than reading skills. Second, it encourages teachers to use authentic texts in classroom so that readers at all levels are able to predict words as found in meaningful contexts. Third, the psycholinguistic model of reading enables teachers to understand the reading process and the strategies which children employ while reading. Their errors (referred to Goodman as "miscues") can also be learned from as Pearson and Stephens (1998) point out, "Errors became generative rather than negative" (p. 29). Fourth, miscue analysis, which is the research tool developed by Goodman, is valued as an efficient means to give insight into the ongoing reading process.



Regarding the analysis of miscues (or unexpected responses), Goodman (1990, pp. 13-14) points out that it helps to reveal the reader's interaction between the reader, the graphic display and the reading process. Miscue analysis has later been developed into think-aloud verbal reports which are widely used in numerous studies, i.e., Cavalcanti (1987), as a research tool to study the strategies employed by readers.

More importantly, Pearson & Stephens (1998) make a point that the concept of reading based on the psycholinguistic perspective has influenced the ways how reading should be taught and learned. Reading teachers began to pay more attention to the relationship between teaching and learning by asking more about how children can be helped to learn to read rather than what is to be taught.

Nuttal (2000, p. 25) sees both bottom-up and top-down approaches as "complementary ways of processing a text." There is a different degree to which each predominates; however, both are needed. Treiman (2001) also points out they can work together so that the processing of texts can be accurate and rapid.

However, Eskey (1990) holds a different view regarding top-down processing in that by placing too much emphasis on higher-level skills, such as prediction or background knowledge, it plays down lower-level skills, for example, identifications of words or grammatical rules. According to Eskey, top-down processing tends to "deemphasise the perceptual and decoding dimensions" (p. 93) less proficient readers or ESL readers especially need in order to cope with their reading process.

### **2.1.3 The Interactive Models**

No reading models, bottom-up or top-down approaches, exclusively match or reflect the ongoing reading process. This is because a reader naturally keeps shifting between the two different types at all times and this is known as interactive reading (Nuttal, 2000). Anderson (1999) considers interactive models to be "the most comprehensive description of the reading process" (p. 4) as they combine features of both types of reading models.



Rayner and Pollatsek (1989) point out that interactive models have a major role to play especially in the field of cognitive psychology in which readers are presumed to make use of both aspects of bottom-up and top-down models in the process of drawing out information and interpretation from the text.

Interactive models allow interaction between bottom-up and top-down processing to take place simultaneously throughout the reading process. The two types of interaction as described by Grabe (1991) are divided into two categories. The first type of interaction refers to the interaction between the reader and the text, while the second one involves numerous component skills which help to facilitate the understanding of the text. Grabe (1991) views the process of reading as a combination of “an array of lower-level rapid, automatic identification skills and an array of higher-level comprehension/interpretation skills” (p. 383). Although different degrees of emphasis have been placed by psychologists and second language researchers, it is believed that these two perspectives work collaboratively during the reading process.

In Hedge’s (2000) view, the word “interactive” can be interpreted in two ways. First, it is used to describe the relationship between the reader and the text. While reading, Hedge (2000) views the active process the reader has in constructing a meaning of the text as well as guessing the author’s intentions as the way of “making sense of the text” (p. 189). According to Hedge (2000), the six types of knowledge the reader is likely to make use of include syntactic knowledge, morphological knowledge, general world knowledge, sociocultural knowledge, topic knowledge and genre knowledge.

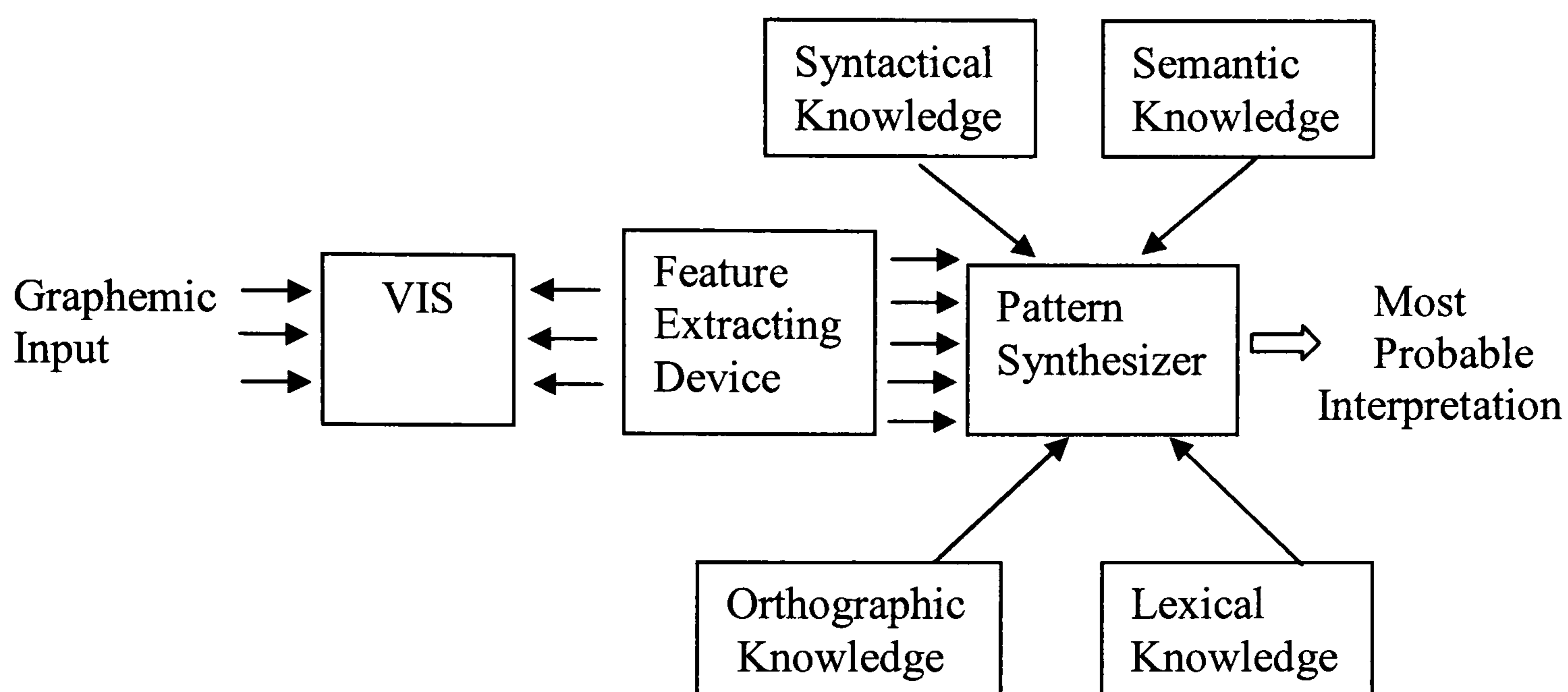
Second, the alternative meaning of the term “interactive” refers to the “interplay among various kinds of knowledge that a reader employs in moving through a text” (p. 189). The two major categories involve: linguistic knowledge and schematic knowledge. While knowledge in linguistics helps the reader decoding the language, the knowledge in schema facilitates the reader’s interpretation of the meaning.

As pointed out by Grabe (1990), interactive models include, “any model that minimally tries to account for more than serial processing and that does so assuming that any parallel or array processing will interact” (p. 60). Some of the key proponents of interactive models that will be discussed next include Rumelhart (1977) and Stanovich (1980).



Rumelhart (1977) has proposed a model of reading in order to present how both types of bottom-up and top-down features can be utilised by the reader while making an interpretation of the text. In order to account for the complexity of the reading process, there is a need to “bridge and blur these two traditional distinctions” (Rumelhart, 1998, p. 864). A simple representation of the Rumelhart model is presented in Figure 2.2.

**Figure 2.2 Rumelhart’s Interactive Model of Reading**



According to Rumelhart (1977) the first stage begins after the graphemic information is picked up by the eye and registered in a Visual Information Store (VIS) or icon, it is extracted and made available to the key component of the model which is referred to as a pattern synthesizer. Once the data is passed through, it is processed by different sources of information which consist of syntactic knowledge, semantic knowledge, orthographic knowledge, and lexical knowledge. Based on the model, these knowledge sources work concurrently while the data is being processed. The final output comes with the most probable interpretation of the text. As opposed to linear models, Rumelhart’s model allows the information residing at a higher stage to influence the processing of a lower stage of analysis.

Rumelhart’s discussion of how context and the reader’s expectations can influence the reading process is found to be concrete and adequate when compared to other previous models and his model makes a contribution to possible future theoretical descriptions of reading (Mitchell, 1982).



Another interactive model has been proposed by Stanovich (1980). The Stanovich model combines aspects drawn from the compensatory processing models and the interactive-compensatory model with the key concept that, “a process at any level can compensate for deficiencies at any other level” (p. 36). In other words, readers regardless of their level of reading proficiency can make use of other knowledge sources to compensate for their deficit. Drawing from the Stanovich model, reading can also be viewed as involving “an array of processes” (Grabe, 1990, p. 61).

According to Samuels and Kamil (1984), the Stanovich model is not only interactive but also compensatory. The model is viewed as interactive due to the fact that it allows the use of lower- and higher level processing to interact at any stage of the reading process, while the use of compensatory processing is helpful for both good and poor readers to work out the meaning of the text utilising the knowledge sources they are more comfortable with.

However, Urquhart and Weir (1998) point out that the Stanovich model and the Goodman model also share some similarities in that both models allow readers’ weaknesses in a particular area of knowledge or skill to be compensated by other knowledge sources during the reading process. In Stanovich’s model, strength in another area is used to compensate for the reader’s weakness in one area of knowledge or skill, whereas the reader in Goodman’s model draws some knowledge from graphophonic, syntactic or semantic cue systems to facilitate understanding in the reading process.

Although interactive-compensatory models have been widely accepted, they come with their own limitations. As raised by Rayner and Pollatsek (1989) interactive models are good at explaining behaviour, but weak at making predictions about the various types of processes which come up during the reading process. According to Urquhart and Weir (1998), this may result from the fact that no two readers are alike in terms of their strengths and weaknesses, making it difficult to cater for their individual differences.

Urquhart and Weir (1998) discuss some implications that can be drawn from bottom-up, top-down, and interactive models which are as follows. Regarding the advent of interactive models, Urquhart and Weir point out that this provides an open door to all other variations, such as the basically bottom-up with some interactive aspects or the basically top-down model with some interactive elements.



Moreover, among the three proposed types of models there is not enough evidence to ascertain which model works best in spite of some exceptions in some fields of word recognition and lexical access operated using bottom-up models. According to Urquhart and Weir (1998), it seems that all types of models are possible. Finally, reading involves a variety of reading activities. This suggests that one single type of model cannot cope with such a diversity of reading tasks; therefore, in some situations, more than one model should be applied during the reading process.

According to Ruddell and Unrau (1998, p. 996), reading is defined as, “a meaning-construction process”. In relation to the classroom context, reading in itself generally involves reader, text and teacher. The interactive relationship between texts and readers is described by Ruddell and Unrau in that, “Texts are constantly reinvented as readers construct different understandings for them in a hermeneutic circle. Meanings for texts are dynamic, not static, as individuals, texts, and contexts change and interact” (p. 997). The teacher’s role is seen as “critical in negotiating and facilitating meaning construction in the text and social context of the classroom” (p. 997).

#### **2.1.4 Schema Theory**

The importance of background knowledge which is also referred to as world or prior knowledge has been widely discussed in both L1 and L2 literature for many decades. According to Anderson (1999), background knowledge includes a variety of types of knowledge the reader brings to the text which includes life experience, educational experience, knowledge of text structures, knowledge about L1 as well as L2, and cultural background and knowledge.

Urquhart and Weir (1998) point out that the inclusion of background knowledge in reading models is derived from two major sources. First, the theory of comprehension has included the role of knowledge which the reader brings to the text. This is due to the belief that the text is not complete by itself; it is through the background or world knowledge the reader brings to the text that helps in facilitating the understanding of the text. Second, the concept of background knowledge has been highlighted through interactive models in reading in relation to the fact that readers with language deficits can compensate by using their world knowledge.



This crucial aspect of the reader's contribution to the understanding of the text is known as the reader's schema. Rumelhart (1977) primarily defines a schema as "generalized knowledge about a sequence of events" (p. 165) and as furthered by Rumelhart (1980):

Schemata can represent knowledge at all levels—from ideologies and cultural truths to knowledge about the meaning of a particular word, to knowledge about the meaning of a particular world, to knowledge about what patterns of excitations are associated with what letters of the alphabet. We have schemata to represent all levels of our experience, at all levels of abstraction. Finally, our schemata are our knowledge. All of our generic knowledge is embedded in schemata. (p. 41)

Anderson and Pearson (1990) describe schema as involving an abstract knowledge structure consisting of "the relationships among its component parts" (p. 42). Before a set of knowledge can be analysed, a set of relationships regarding which form and substance of schema need to be specified first are referred to as "slots". Once the background knowledge is activated and these slots are "instantiated", the meaning of the text can be constructed.

As pointed out by Carrell and Eisterhold (1990), "Comprehending a text is an interactive process between the reader's background knowledge and the text" (p. 76). It is based on the belief that any text, written or spoken, only guides directions for listeners or readers. In order to interpret meaning from a text, previously acquired knowledge has to be drawn on. In this regard, the reader's schemata directly influence the construction of the meaning of the text as well as the interpretation of the text.

According to Anderson (1998), a reader's schema which is defined as organised knowledge of the world also forms the basis of the three key areas of comprehension, learning, and memory. As comprehension relies on the reader's abilities in constructing and interpreting the meaning of the text, more than one interpretation is found to be common. Some of the contributing factors include the reader's age, sex, race, religion, etc. which can be summed up under the umbrella term as the readers' culture. In relation to the other two areas of the schema theory in learning and memory, Anderson (1998) points out that different levels of analysis are involved in the reading process, some of which include graphophonemic, morphemic, semantic, syntactic and pragmatic elements.



However, as reading is considered to be interactive, these levels can take place in both bottom-up and top-down processes. Anderson lists the six functions of schemata as follows:

- A schema provides ideational scaffolding for assimilating text information.
- A schema facilitates selective allocation of attention.
- A schema enables inferential elaboration.
- A schema allows orderly searches of memory.
- A schema facilitates editing and summarising.
- A schema permits inferential reconstruction.

Anderson (1998, pp. 473-474)

Two distinctions of schemata are drawn between formal schemata and content schemata (Carrell & Eisterhold, 1990). While the first refers to “background knowledge of the formal, rhetorical organizational structures of different types of texts, the latter involves “background knowledge of the content area of a text” (p. 79). In order to understand the text, both types of schemata (formal and content) are needed to be activated appropriately.

In relation to a content schema, major causes of miscomprehension usually derive from: the reader’s not activating appropriate schemata anticipated by the writer or the writer’s not giving enough clues in the text for the reader to follow (Carrell & Eisterhold, 1990). There are a number of studies reflecting how the readers’ knowledge of the world has played an important role in readers’ language comprehension. A cross-cultural experimental study carried out by Steffensen, Joag-Dev, and Anderson (1979) as quoted in Anderson (1998) shows how background knowledge facilitates readers’ text comprehension. In the study, two groups of Indian and American adults are asked to read letters about weddings in the two cultures. The findings reveal that both the Indians and the Americans took less time reading about their own native wedding ceremonies and were able to recall more main ideas.

Another experimental study carried out by Johnson (1982) confirms there is a relationship between activating background information and the rate of recalling main ideas. In this study, ESL readers who have activated their prior cultural experience recall the text better than those who have not. Johnson (1982) concludes, “Familiarity with a foreign culturally related topic, knowledge obtained from real experiences in the foreign culture, is effective for reading comprehension of a passage on that topic” (p. 514).



Hudson's (1982) study shows an interaction between overall linguistic proficiency in ESL and content-induced schematic effects in ESL reading comprehension. In the study, 93 ESL readers were asked to read reading passages with three different methods of intervention: Pre-Reading (PRE), Vocabulary (VOC), and Read-Test/Read-Test (RT). According to the study, the PRE treatment was found to be the most effective. Results indicate that there are differences in the way readers at different levels of proficiency form their schemata and that advanced readers are found to comprehend printed input better than those at the beginning or intermediate levels.

In relation to a formal schema, research indicates that knowledge of text structure influences reading comprehension. In a study conducted by Carrell (1984a), two groups of university-bound, intermediate-level ESL students from different countries such as Spain and Japan were asked to read a simple story with 2 variations: one with a standard story schema structure and the other one with interleaved story schema structure. Results show that the quantity of recall and the temporal sequences of recall are affected by differences in story structures. ESL readers' recall was greater when the content is kept constant and the rhetorical structure is presented in the format that conforms to reader's schemata.

Another study carried out by Carrell (1984b) was to find out the effects of both types of culture-specific content and formal schemata in ESL reading. While one half of the students were assigned to read texts on a familiar topic which were presented in a well-organised format, the other half read a text on an unfamiliar subject with an altered rhetorical format. Based on the results, as expected the group who read familiar texts with a well-organised format had a better understanding of the texts. In comparison between the groups of students who were assigned to read mixed conditions of familiar content with unfamiliar format and unfamiliar content with familiar format, it has been discovered that content schemata have a greater effect on the students' comprehension than formal schemata.

Based on the research carried out on the two types of schemata, it is pointed out by Carrell (1984b) that,

Texts with familiar content, should be easier to read and comprehend than texts on content from a distant, unfamiliar cultural heritage. Similarly, research of formal schemata clearly suggests that texts with familiar rhetorical organization should be easier to read and comprehend than texts with unfamiliar rhetorical organization. (p. 464)



In relation to ESL reading, especially with cultural-specific content, Carrell (1984b) also claims that background knowledge of a text has a vital role in facilitating understanding of the cultural content knowledge. With implications for EFL/ESL readers, Carrell and Eisterhold (1990) suggest that the aim in reading lessons should be to “minimize reading difficulties and to maximize comprehension by providing culturally relevant information” (p. 85). However, this may sound impractical due to the fact that readers possess different degrees of background knowledge especially those who come from different cultural backgrounds. Therefore, reading teachers have a crucial role to play together with the variables of the text as well as the reader during classroom activities (Carrell & Eisterhold, 1990).

Concerning the issue of text manipulation, while Carrell and Eisterhold (1990) point out that some materials can be used as a way of text control, Anderson (1998) raises the issue about publishers and their role to provide more help and support to learners through their published materials as follows. For example, teaching suggestions should be included in manuals to help learners activate relevant background knowledge before reading or supply prerequisite knowledge in case of basal programmes or content area texts. Moreover, lesson activities should be integrated between what learners already know and what is presented. Next, the structure of text materials should be made clear and easy to follow. Lastly, points have to be taken into consideration when dealing with the issue of culture so that learners coming from minority cultures are not put at their disadvantage.

Different researchers or writers (i.e., Carrell and Eisterhold, 1990; Anderson, 1998) give different opinions in relation to the implications of schema theory on the reader in classroom. While Carrell and Eisterhold (1990, pp. 87-88) hold the view that it is important for the teacher to avoid having students read material “cold”, Anderson (1998) expresses concern that some of the problems come from students’ lack of appropriate background knowledge. Both agree that the reading teacher has a major role to play in facilitating the reading process by providing or activating sufficient background information beforehand. Anderson (1998) points out that the teacher’s responsibility also includes correcting wrong concepts students may have about certain topics as they may hinder comprehension.



Some of the classroom activities suggested by Anderson (1998; Carrell, 1990a) to activate readers' background knowledge include some pre-reading discussions on a topic as well as on the type of text structure, the use of semantic maps and teaching students to make predictions.

Pearson and Stephens (1998) view schema theory as helpful in explaining reading comprehension, "it provides a rich and detailed theoretical account of the everyday intuition that we understand and learn what is new in terms of what we already know" (p. 32). Moreover, it encourages the examination of texts in relation to students' knowledge and cultural backgrounds against ideas as found in the text.

However, Urquhart and Weir (1998) note problems in relation to how background knowledge can be defined as well as how it can be tested. According to Urquhart and Weir (1998), the notion of schemata is not useful in reading research due to the following arguments: firstly, schemata are described in different ways by different researchers. Secondly, the synonym of schema as equivalent to background knowledge does not provide meaningful interpretation. Thirdly, the descriptions of schemata as reviewed in reading literature are not adequate despite their popularity and finally, the notion of schemata lacks mental constructs resulting in its inability to provide generalizations.

Despite contradictory views of schema theory, it is not only found to be a useful concept in understanding how readers go about interpreting texts but it also has had a prominent position in numerous studies in the field of reading comprehension for a number of decades (Devine, 1986; Nuttall, 2000).

## **2.2 Language Learning Strategies**

In the field of second language learning and teaching practices, some of the major issues raised among ESL teachers are the questions of what can they do to help their students become more proficient in English as well as why some students are more successful at their learning while others struggle (Chamot, 1987, p.71). Wenden (1987a, p.3) points out that the trend of language learning and teaching has shifted from teaching methods to "learner characteristics and their possible influence on the process of acquiring a second language" since the early seventies.



As noted by Altman (1980, p. 1), some of the terms, such as “learner-centred”, “student-centred”, and “individualized” have been used to introduce the central role the language learner has in the teaching/learning process while individual differences in terms of their needs, abilities, and interests have been taken into account in designing language curricula. Wenden (2002, p. 32) uses the term “learner development” to refer to “a learner-centred innovation in FL/SL instruction that responds to learner diversity by aiming to improve the language learner’s ability to learn a language.”

The research and practice in this field have been classified as self-directed language learning (SDLL) and learner strategies in language learning (LSLL). Although both approaches share the common aim of helping to improve the learner’s strategies development, their implementations of learner development differ. That is, while SDLL which was originally developed from adult education in the 1970s, holds the belief that education should prompt learners to have a more active role in their learning, LSLL, which was derived from intellectual trends in North America in the 1960s, is based on cognitive science. It views human cognition as the active processing of information and highlights the role that instruction plays in language learning.

As the nature of the current study is learner strategy research, the following discussion is based on some key features related to LSLL including the notions of education goals, learning objectives, settings and learner/teacher roles.

### **2.2.1 Learner Strategies in Language Learning (LSLL)**

Wenden (2002) points out that the educational focus of early work on language strategies placed on a good/successful learner, defined this type of a learner as someone who “could approach the task of language learning competently and effectively” (p. 36). Some of the early studies on LSLL as carried out by, for example, Rubin (1975) and Naiman, Fröhlich, Stern and Todesco (1978), focused on documenting the strategies of good/successful language learners with the hope that implications can be drawn and give some guidance on how less successful language learners can improve their learning skills. To quote from Wenden (2002, p. 36):



The learning objectives of LSL are based on findings from the research on successful language learners which revealed that these learners deploy a variety of strategies to deal with the learning problems they encounter. Therefore, teachers are encouraged to help students learn to use learning strategies – to attend to incoming information to be learned, comprehend it, and to store and retrieve what is learned.

In helping students to do so, learning strategy instruction plays a key role in enforcing the use of strategies so that students know how to apply their strategic knowledge appropriately when dealing with the different types of pedagogical tasks they come across. Like most other research in strategy training, it usually involves instructional interventions; therefore, LSL usually takes place in the classroom setting.

It can be said that the teacher has a central role to play in providing language instruction. Two aspects of the teacher's responsibility involve the preparation of methods and materials and the development of guidelines for effective strategy instruction (Wenden, 2002).

Concerning the implications of LSL, this study aims to explore the effects of strategy training on Thai college students' reading comprehension with comparison between more proficient and less proficient readers. This is due to the fact that basic concepts of language learning and reading strategies share a number of similarities. This study aims to shed some light on how second language reading strategies as well as reading strategy instruction can be implemented in language classrooms to maximise and enhance learning.

### **2.2.2 Definitions of the Terms**

The terms *strategy* and *learning strategies* are key concepts in the current study, it is therefore necessary to clarify their definitions according to the way they are referred to in the literature on language learning.

As one of the pioneering researchers on learning strategies, Rubin (1975) defines the term strategy as “the techniques or devices which a learner may use to acquire knowledge” (p. 43). Wenden (1987a, p. 7) points out that the term “strategies” has also been referred to as “techniques, tactics, cognitive abilities, and language processing strategies”, while some other alternative terms listed by Oxford (1990, p. 2) also include “learning skills, thinking skills, and problem-solving skills.”



A more inductive approach suggested by Wenden states that strategies convey the following characteristics:

- (1) Strategies refer to specific actions or techniques.
- (2) Some of these actions are observable and others will not be.
- (3) Strategies are problem orientated.
- (4) The strategies are used to refer to language learning behaviours that contribute both directly and indirectly to learning.
- (5) Strategies may be found to be consciously employed or automatically used at other times depending on learning problems.
- (6) Strategies are behaviours that are likely to undergo some change over time.

(Wenden, 1987a, pp. 7-8)

Despite the differences in the way how the term has been defined, Erhman et al. (2003) point out that all definitions of strategies convey the sense of the conscious movement learners undertake in reaching a language goal. In support of this claim, Cohen (2003, p. 279) perceives strategies as “specific behaviors that learners select in their language learning use”, while Oxford (2003) considers a strategy as “a plan that is consciously aimed at meeting a goal” (p. 274). As suggested by Oxford (2003), a strategy should also be viewed in relation to its usefulness under the three following conditions

- (1) the strategy relates well to the L2 task at hand, (2) the student employs the strategy effectively and links it with other relevant strategies for doing the task; and learning style preferences to one degree or another, and (3) the strategy coordinates with the student’s general learning style preferences to one degree or another.

(Oxford, 2003, p. 274)

After early research from Rubin (1975), Stern (1975) and Naiman et al. (1978), the concept of strategy has been developed and transformed into learning strategies. However, some distinction has been drawn between the terms *learner strategies* and *learning strategies*. Rubin (1987, p. 19) defines learner strategies as “what learners *do* to learn and *do to regulate* their learning” and learning strategies as “strategies which contribute to the development of the language system which the learner constructs and affect learning directly” (p. 23).

According to Chamot and O’Malley (1994), these two terms can be viewed from different perspectives in relation to the levels of explicitness and implicitness. Learner strategies can be referred to those strategies students have developed on their own in order to solve any language learning difficulties they encounter. These strategies can be implicit or explicit in nature.



In contrast, the term learning strategies conveys an explicit process in relation to the language learning context. As pointed out by Chamot and O'Malley (1994), these strategies have the potential to be included as part of instruction in both L1 and L2 contexts.

Regarding the current study which is a classroom experiment in nature, the notions of strategies and learning strategies as proposed by John Michael O'Malley and Uhl Chamot will be observed. According to O'Malley and Chamot (1990), strategies are "the tools for active, self-directed involvement needed for developing L2 communicative ability", whereas learning strategies are defined as, "the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (p. 1). More specific definitions of strategies as geared towards the reading context will be discussed in Section 2.4.1.

### **2.2.3 Classification of Language Learning Strategies**

A number of L2 strategy classification systems have been divided into groups, some of which include Cohen (1990), O'Malley and Chamot (1990), Oxford (1990), and Rubin (1975). As a consequence, the diversity of the studies carried out in the area of learning strategies results in lack of coherent, well accepted system for describing strategies. Moreover, this makes it problematic to compare the results of strategies across studies (Chamot, 1987).

Oxford (1990, p. 17) has made a point that classification conflicts are inevitable as the concept of learning strategies is still in its early stages and still needs to be tested through classroom implementation and research. Oxford (1990) comments on this issue as follows:

At this stage in the short history of language learning strategy research, there is no complete agreement on exactly what strategies are; how many strategies exist; how they should be defined, demarcated, and categorized; and whether it is – or ever will be – possible to create a real, scientifically validated hierarchy of strategies. (p. 17)

However, strategies have been found to be beneficial for learners in helping them to become more proficient with more control of their own learning (Oxford, 1990).



Regarding the same issue, White (1995) makes a remark that most of the research carried out on language learning strategies has two options in either following a scheme on the metacognitive, cognitive, and socio-affective strategies proposed by O'Malley & Chamot (1990) or the framework extended by Oxford (1990). The following Sections of 2.3.3.1 and 2.3.3.2 will, therefore, be devoted to discussing concepts and classifications of learning strategies as proposed by Oxford (1990) and O'Malley and Chamot (1990) respectively.

### 2.2.3.1 Language Learning Strategy Framework Extended by Oxford (1990)

Opposed to the technical definition which describes learning strategies as “operations employed by the learner to aid the acquisition, storage, retrieval, and use of information”, Oxford (1990) proposes that learning strategies are “specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations” ( p. 8). Suggested features of language learner strategies as quoted from Oxford (1990, p.9) are as follows:

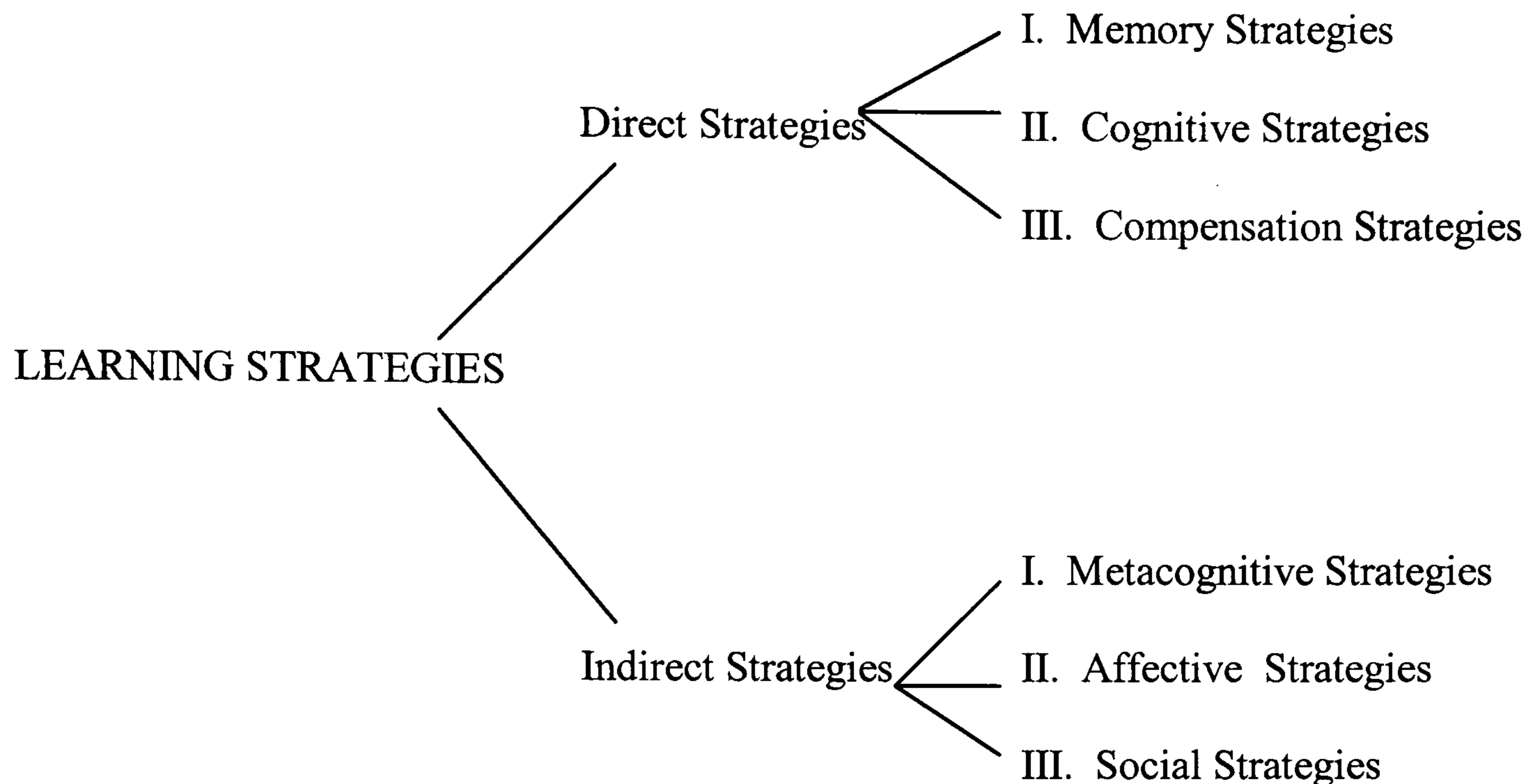
#### Figure 2.3 Features of Language Learning Strategies

Language learning strategies
1. Contribute to the main goal, communicative competence.
2. Allow learners to become more self-directed.
3. Expand the role of teachers.
4. Are problem-oriented.
5. Are specific actions taken by the learner.
6. Involve many aspects of the learner, not just the cognitive.
7. Support learning both directly and indirectly.
8. Are not always observable.
9. Are of the conscious.
10. Can be taught.
11. Are flexible.
12. Are influenced by a variety of factors.

Oxford (1990, p.14) divides learning strategies into two major categories: direct and indirect. Each category of direct and indirect strategies is then subdivided into three main classes. The direct category includes memory, cognitive, and compensation strategies while metacognitive, affective, and social strategies belong to the indirect category. Oxford proposes that both categories help to support each other. The diagram can be presented as follows:



**Figure 2.4 Diagram of the Strategy System: Overview**



The six strategies in Oxford (1990) are discussed in conjunction with some practical examples provided as follows:

1. Cognitive strategies enable the learner to manipulate the language material in direct ways. Some of the examples include reasoning, note-taking, and synthesizing.
2. Metacognitive strategies are used to manage the learning process overall. Some of the examples include planning, monitoring mistakes, and evaluating task success.
3. Memory-related strategies help learners to link one L2 item or concept with another but do not necessarily involve deep understanding. Some of the examples include acronyms, sound similarities, images and key words.
4. Compensatory strategies help make up for missing knowledge. Some of the examples include guessing from the context, circumlocution, and gestures.
5. Affective strategies help learners manage their emotions and motivation level. Some of the examples include identifying one's mood and anxiety level, talking about feelings and rewarding oneself.
6. Social strategies enable the learner to learn via interaction with others and understand the target culture. Some of the examples include asking questions, asking for clarification, asking for help and exploring cultural and social norms.

(Ehrman et al., 2003, pp. 316-317)



### **2.2.3.2 Language Learning Strategy Framework Proposed by O'Malley and Chamot (1990)**

#### **2.2.3.2.1 Framework for a Cognitive Theory**

Second language learning can be viewed from linguistic and cognitive approaches. The distinction between the two approaches is that linguistic approaches believe human beings are “endowed with a language-specific module” in their minds while cognitive approaches view language learning as an aspect of cognition in stating that, “the human mind is geared to the processing of all kinds of information (information being understood in a broad sense), and linguistic information is just one type, albeit highly complex.” (Mitchell & Myles, 1998, p. 73).

According to O'Malley and Chamot (1990), language learning is viewed as a complex cognitive skill where learners are processors of information. Under cognitive theory, learners play an active role in processing information using their “mental processes”. O'Malley and Chamot apply Anderson's ACT\* model (Adaptive Control of Thought) as a framework to explain how information is stored and how new information is acquired in the field of language learning strategies.

Anderson (1983) proposes three different kinds of memory: a working memory (short-term memory) and declarative and procedural memories (two types of long-term memory). Moreover, Anderson believes that declarative and procedural memories are two different kinds of knowledge that are stored differently. According to Anderson (1983, p. 34): “All knowledge initially comes in declarative form and must be interpreted by general procedures.” The move from declarative to procedural knowledge takes place in three stages which involve the cognitive stage, the associative stage, and the autonomous stage which is also referred to as proceduralisation (Anderson, 2005, p. 463).

On application of Anderson's model in the field of language learning strategies, learning strategies are described as complex cognitive skills which may include any of the following:

Focusing on selected aspects of new information, analyzing and monitoring information during acquisition, organizing or elaborating on new information during the encoding process, evaluating the learning when it is completed, or assuring oneself that the learning will be successful as a way to allay anxiety.

(O'Malley & Chamot, 1990, p. 43)



In application to the language learning context, Rubin (1996) points out that declarative knowledge is what learners know about the language systems: the linguistic system, the sociolinguistic system, and the pragmatic system, whereas procedural knowledge is what learners know about the learning process, namely, what learners know about how to learn a foreign or second language. Moreover, declarative knowledge can be acquired through building on prior knowledge, while practice helps to develop procedural knowledge (O'Malley & Chamot, 1990). In their view:

Learning strategies are complex procedures that individuals apply to tasks; consequently, they may be represented as procedural knowledge which may be acquired through cognitive, associative, and autonomous stages of learning. As with other procedural skills at the different stages of learning, the strategies may be conscious in early stages and later be performed without the person's awareness. (p. 52)

As discussed earlier, learning strategies are viewed as special thoughts or behaviours that learners use to process incoming information so that it can be understood, learnt or retrieved later, there is a need for strategies to be learned in the same way as other complex cognitive skills.

Finally, O'Malley and Chamot (1990) propose benefits regarding the application of cognitive theory to second language acquisition which can be summed up as follows.

- Learning is an active and dynamic process in which individuals make use of a variety of information and strategic modes of processing;
- Language is a complex cognitive skill that has properties in common with other complex skills in terms of how information is stored and learned.
- Learning a language entails a stagewise progression from initial awareness and active manipulation of information and learning processes to full automaticity in language use; and
- Learning strategies parallel theoretically derived cognitive processes and have the potential to influence learning outcomes in a positive manner.

(O'Malley & Chamot, 1990, p. 217)



### 2.2.3.2.2 Strategies Classification Scheme Proposed by O'Malley and Chamot

Based on systematic research within the theoretical framework of information processing theory, O'Malley and Chamot (1990) propose a framework of learning strategies which are divided into three distinctive categories of metacognitive, cognitive, and social/affective strategies depending on the level or type of processing they involve. Descriptions of each category are as follows:

Metacognitive strategies, which involve executive processes in planning for learning, monitoring one's comprehension and production, and evaluating how well one has achieved a learning objective.

Cognitive strategies, in which the learner interacts with the material to be learned by manipulating it mentally (as in making mental images, or elaborating on previously acquired concepts or skills) or physically (as in grouping items to be learned in meaningful categories, or taking notes on important information to be remembered).

Social/affective strategies, in which the learner either interacts with another person in order to assist learning, as in cooperation or asking questions for clarification, or uses some kind of affective control to assist a learning task.

O'Malley and Chamot (1990, p. 197)

Each category is then sub-divided into its subsequent strategies, details of which can be referred to in Table 2.1.

**Table 2.1 Strategies Classification Scheme by O'Malley and Chamot (1990)**

#### Metacognitive strategies

Advance organization	Previewing the main ideas and concepts of the material to be learned, often by skimming the text for the organizing principle.
Advance preparation	Rehearsing the language needed for an oral or written task.
Organizational planning	Planning the parts, sequence, and main ideas to be expressed orally or in writing.
Selective attention	Attending to or scanning key words, phrases, linguistic markers, sentences, or types of information.
Self-monitoring	Checking one's comprehension during listening or reading, or checking one's oral or written production while it is taking place.



Self-evaluation	Judging how well one has accomplished a learning task.
Self-management	Seeking or arranging the conditions that help one learn, such as finding opportunities for additional language or content input or practice.
<b><u>Cognitive strategies</u></b>	
Resourcing	Using reference materials such as dictionaries, encyclopedias, or textbooks.
Grouping	Classifying words, terminology, numbers, or concepts according to their attributes.
Note taking	Writing down key words and concepts in abbreviated verbal, graphic, or numerical form.
Summarizing	Making a mental or written summary of information gained through listening or reading.
Deduction	Applying rules to understand or produce language or solve problems.
Imagery	Using visual images (either mental or actual) to understand and remember new information or to make a mental representation of a problem.
Auditory representation	Playing in back of one's mind the sound of a word, phrase, or fact in order to assist comprehension and recall.
Elaboration	Relating new information to prior knowledge, relating different parts of new information to each other, or making meaningful personal associations with the new information.
Transfer	Using what is already known about language to assist comprehension or production.
Inferencing	Using information in the text to guess meanings of new items, predict outcomes, or complete missing parts.
<b><u>Social/affective strategies</u></b>	
Questioning for clarification	Eliciting from a teacher or peer additional explanation, rephrasing, examples, or verification.
Cooperation	Working together with peers to solve a problem, pool information, check a learning task, or get feedback on oral or written performance.



Self-talk

Reducing anxiety by using mental techniques that make one feel competent to do the learning task.

(O'Malley and Chamot, 1990, pp. 198-199)

The distinctions between the three categories are vital in giving some indication of which strategies are the most important in facilitating the effectiveness of learning (Graham, 1997). As summed up by Benson (2001), metacognitive strategies make use of knowledge of cognitive processes to control the learning process, while cognitive strategies are operations carried out directly to process the material to be learned. Social/affective strategies refer to the ways in which learners interact with others in order to enhance their learning. In brief, metacognitive strategies can be viewed as ways learners organise their own learning, while cognitive strategies reflect what learners do to process information to be learned. Motivation plays a major role in the learning process and is exercised by learners through social/affective strategies. More specific definitions in relation to the reading context will be later discussed in Section 2.3.1.

A distinction is also made between learning and communication strategies. With reference to Table 2.1, communication strategies are not included in O'Malley and Chamot's language learning classification as they are viewed as possessing different characteristics. According to O'Malley and Chamot (1990), the key issue of learning strategy research is placed on language acquisition, while the research on production and communication strategies focuses more on language use. In other words, the goal of learning strategies is geared towards learning, whereas the use of communication strategies is initially to achieve communication goals or sometimes to overcome language barriers.

This view is in contrast with Oxford (1990) who views the use of communication strategies as helpful strategies for learners. By enabling learners to stay in the conversation, it provides the chance for communication to continue and further learning to take place. However, Chamot, Bernhardt, El-Dinary, and Robbins (1996, p. 177) agree that, "Many communication strategies may serve as effective learning strategies when they are used to achieve a learning goal." Regarding this issue, Wenden (1987a), states that there does not seem to be a clear-cut difference between communication strategies and learning strategies.



#### 2.2.4 Framework on Language Strategy Training

As discussed earlier, the focus of language teaching has shifted from teacher-centred towards more learner-centred instruction, in which learners are encouraged to take more responsibility for their own learning throughout a number of instructional programmes in foreign language classrooms. One type of key instruction is based on the incorporation of learning strategies into learners' lessons which is also referred to as "teaching to learn". In this study, the terms "strategy training" and "strategy instruction" will both be used to refer to the concept of teaching learning strategies and language learning strategy instruction.

One common concept connected with language strategy training is that "Language learning will be facilitated if students become more aware of the range of possible strategies that they can consciously select during language learning and language use" (Cohen, 1998, p. 65).

Some issues raised in language learning instruction are whether learning strategies should be focussed on separately or be integrated into the course content. According to O'Malley & Chamot (1990), this argument echoes the issue as to whether strategy instruction should be direct or embedded. The difference between the two types of strategy instruction is described as:

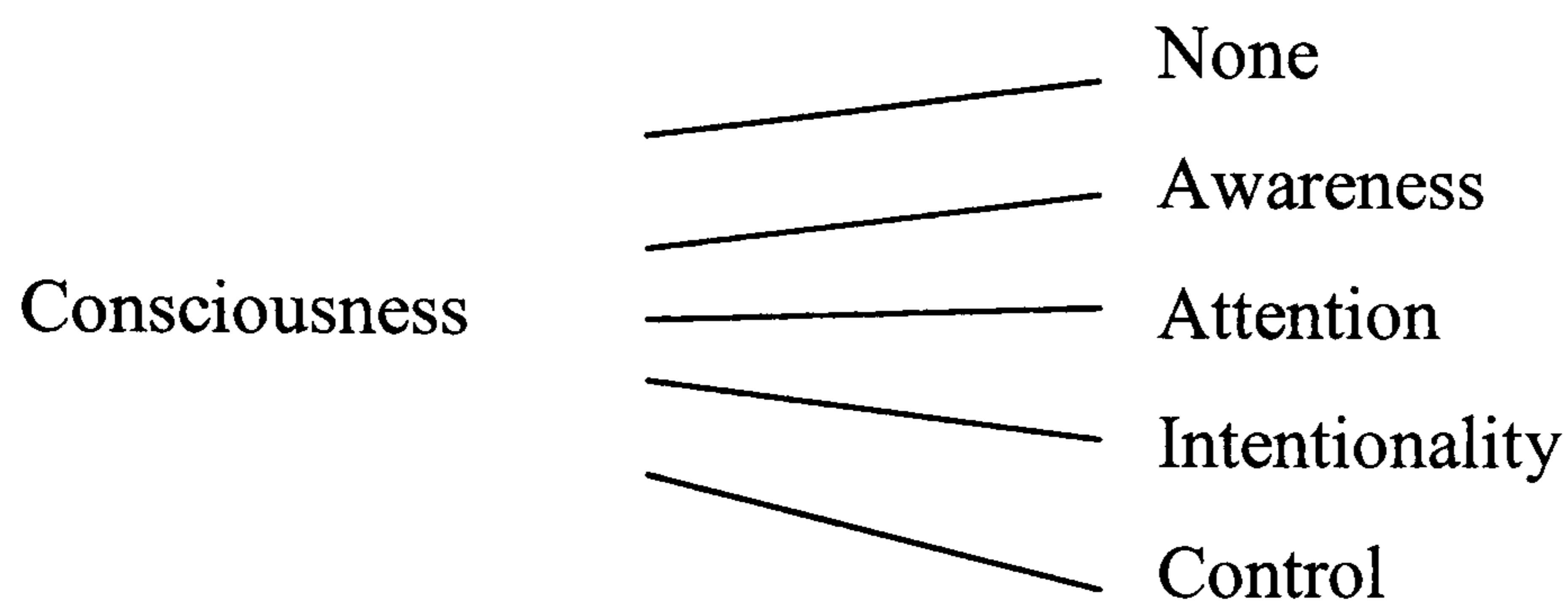
In *direct instruction*, students are informed of the value and purpose of strategy training, whereas in *embedded instruction*, students are presented with activities and materials structured to elicit the use of strategies being taught but are not informed of the reasons why this approach of to learning is being practised. (p. 153)

With reference to the first issue, Wenden (1987b) expresses the view that there is a close relationship between strategy training and a language learning experience. Moreover, it is more effective to learn in context as it enables learners "to perceive the relevance of the task, enhances comprehension, and facilitates retention" (p. 161). In support of direct strategy training, Dodour and Robbins (1996) list three disadvantages of embedded (blind) instruction as follows: firstly, there is no transfer of strategy use to new tasks, secondly, there is no development of independent learning strategies, and thirdly, there is little opportunity for students to become independent learners. Because of these reasons, direct strategy training is found to be a better approach.



Regarding the role of consciousness, Oxford & Leaver (1996) quoted Schmidt (1994) in stating that the four key factors in strategy instruction consist of four aspects of awareness, attention, intentionality and control. These four levels of consciousness are paramount in raising learners' awareness to have full control of strategy use, while the lack of consciousness is referred to as "None" in the figure below.

**Figure 2.5 Consciousness Contrasts**



According to Oxford & Leaver (1996), "blind" or embedded strategy training does not involve learners' consciousness of strategies. Particular strategies may be taught to learners without being informed of their usefulness by their teachers. As a result, students are not aware of those strategies and may not use them as regularly nor gain full control of them. The other four levels of awareness, attention, intentionality and control are important factors contributing to the success of strategy training, in which learners' awareness of strategy use needs to be raised so that they can pay attention to the way in which they utilise strategies. While "informed" strategy instruction helps learners to use strategies more intentionally, the final level of consciousness helps learners to have full control and transfer the strategies to learning tasks successfully.

According to Cohen (1998, pp. 66-67) if students are provided with strategy training, they can improve in both their learning skills and language skills which will enable them to:

- (1) self-diagnose their strengths and weaknesses in language learning;
- (2) become more aware of what helps them to learn the language they are studying most efficiently;
- (3) develop a broad range of problem-solving skills;
- (4) experiment with both familiar and unfamiliar learning strategies;
- (5) make decisions about how to approach a language task;
- (6) monitor and self-evaluate their performance; and
- (7) transfer successful strategies to new learning contexts.



The goal of strategy training is set to incorporate learning strategies into the lessons and teach students explicitly so that they know how, when, and why these strategies can be used to help them learn a foreign language. As a further goal, this will gradually make learners become autonomous and self-directed (Cohen, 1998, pp. 70-71).

Some basic components of strategy training as suggested by Cohen (1998, p. 71) are:

It emphasizes discussions about the use and value of strategies, encourages conscious and purposeful strategy use and transfer of those strategies to other contexts, and allows students to monitor their performance and evaluate the effectiveness of the strategies they are using.

In spite of various suggested training approaches, there is no empirical evidence to determine what constitutes the best approach for conducting strategy training. Two key approaches identified by Cohen (1988) are Oxford (1990) and O'Malley and Chamot (1990).

According to Oxford and Leaver (1996, p. 228), strategy instruction involves “active learning and growth on the part of each individual student” so that learners become more independent and self-directed in their own learning. Therefore, the aim should be to enable learners to find out what strategies are most appropriate for their own learning.

Among various modes of strategy training, Oxford (1990) suggests three different ways; awareness training, one-time strategy training, and long-term strategy training. In awareness training or consciousness-raising, learners are introduced through some general concepts to language learning strategies without necessarily having to use them during their training, whereas one-time strategy training familiarised students with strategy use through real language tasks. In terms of effectiveness, Oxford (1990) points out that one-time strategy training is found to be less useful than long-term strategy training. Although both types of strategy training enable students to practise using strategies in actual tasks, long-term strategy training has the advantage of being able to cover a wider range of strategies throughout a longer period of training time.

As suggested by Oxford (1990), the eight-step model for strategy training should be followed when engaging in one-time strategy training or long-term strategy training.



## Figure 2.6 Steps in the Strategy Training Model

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- 1) Determine the learner's needs and the time available.
  - 2) Select strategies well.
  - 3) Consider integration of strategy training.
  - 4) Consider motivational issues.
  - 5) Prepare materials and activities.
  - 6) Conduct "completely informed training."
  - 7) Evaluate the strategy training.
  - 8) Revise the strategy training.
- 

Oxford (1990, p. 204)

According to Chamot and Rubin (1994, p. 773), important components of strategies instruction are to:

- (a) discover and discuss strategies students are already using for specific learning tasks;
- (b) present new strategy(ies) by explicitly naming and describing them;
- (c) model the strategy(ies),
- (d) explain why and when the strategy(ies) can be used, and
- (e) provide extensive practise with authentic tasks and opportunities for students to discuss their own applications of the strategy(ies) and assessment of their effectiveness.

In order to set up a training course for students with limited English proficiency (LEP) who are in upper elementary and secondary schools, the Cognitive Academic Language Learning Approach (CALLA) was set up by Chamot and O'Malley aimed at targetted students who are in the following three specified categories:

1. Students who have developed social communicative skills through beginning level ESL classes or through exposure to an English-speaking environment, but have not yet developed academic language skills appropriate to their grade level.
2. Students who have acquired academic language skills in their native language and initial proficiency in English, but who need assistance in transferring concepts and skills learned in the first language to English.
3. Bilingual English-dominant students who have not yet developed academic language skills in either language.

(O'Malley & Chamot, 1990, p. 191)



In brief, CALLA aims to develop students' academic skills by combining language learning strategies within learning tasks and activities so that both of their language skills and content areas skills can be developed. Therefore, the three components integrate: "topics from the major content subjects, development of academic language skills, and direct instruction in learning strategies" (O'Malley & Chamot, 1990, p. 193).

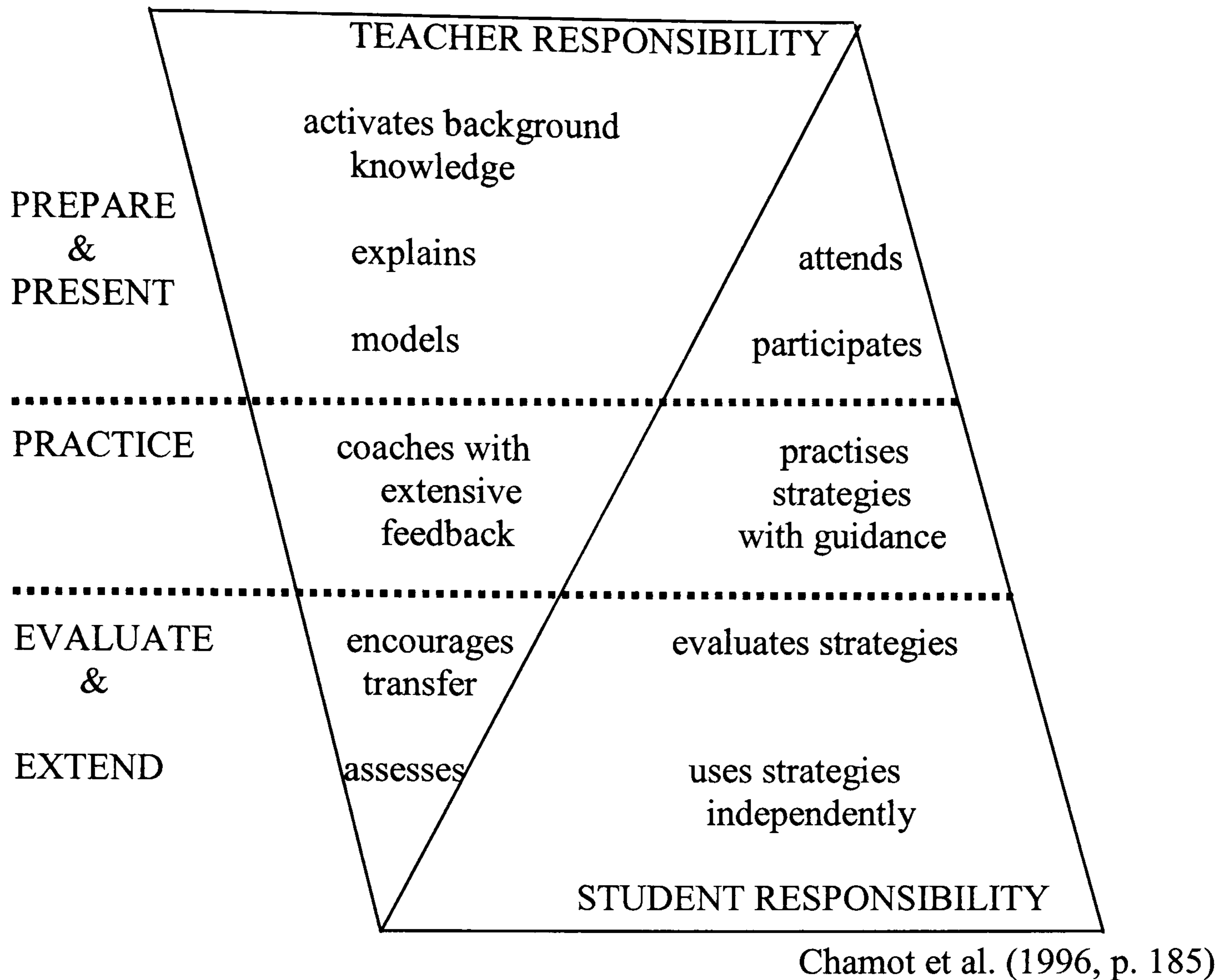
Four main propositions have been made in relation to the notion of learning strategy training which are firstly, mentally active learners are better learners, secondly, strategies can be taught, thirdly, learning strategies transfer to new tasks and finally, academic language learning is more effective with learning strategies (Chamot & O'Malley, 1987).

CALLA lessons are divided into five phases: Preparation, Presentation, Practise, Evaluation, and Follow-up (Chamot & O'Malley, 1987). The three main categories embedded in the strategy training include the categories of metacognitive, cognitive, and social/affective strategies, details of which have been discussed earlier in Section 2.3.2.2.

More emphasis on learning strategies and more responsibility on the learners' part "does not in any way put teachers out of work" (Cohen, 1998, p. 97) as they still have a key role to play in conducting strategy training. However, their responsibility is shared more with learners. As pointed out by Rubin (1996, p. 151), "Much of the current strategy instruction is focussed on first teaching teachers about learner strategies and about how to teach learners to use them more effectively. Teachers then present those strategies during a foreign or second language class."

Based on Chamot et al. (1996), in order for strategy training to be conducted successfully, both teachers and learners have dual responsibilities to undertake in the learning/teaching process. A framework proposed by Chamot et al. (1996) is as follows:



**Figure 2.7 Framework for Strategy Instruction**

As can be seen from the figure, teachers have a supportive role in guiding and helping students through explaining and modelling strategy use in the beginning, whereas students become less dependent on teachers and gain more control of the use of strategies at the end of their training.

In conclusion, Chamot and Rubin (1994, p. 774) state that “learning strategies instruction is not a magical formula to improve learner performance” and that there are many variables, i.e., learner, context, task, teacher, and text, that need to be taken into consideration. The findings in relation to strategy use and strategy training will be discussed in the next section.

### 2.2.5 Research on Language Learning Strategies

According to Chamot et al. (1996), research on language learning strategies has been divided into two main approaches. The first approach deals mainly with identifying the characteristics of good language learners and later expands to the inclusion of descriptions of the strategy use of less successful language learners, whereas learning strategies instruction is the main concern of the second approach.



This is based on the belief that good or successful language learners are different from less successful or less effective learners in the type and the range of strategies they use. If the strategies used by good or effective language learners can be identified, these strategies can be taught to less successful ones. These learning strategies are effective tools to assist less successful language learners in their language learning.

The discussion of related studies is divided into two main sections; research into language learning strategies will be discussed in Section 2.2.5.1, while the studies concerning language strategy training will be reviewed in Section 2.2.5.2.

### **2.2.5.1 Research of Language Learning Strategy Use**

One of the earliest studies on language strategies was carried out by Rubin (1975). It is based on her belief that good language learners utilise certain strategies enabling them to be successful with their learning. If the strategies these good learners employ can be isolated, they will be helpful in providing teachers with a better understanding of the learning process. More importantly, the strategies will help to give some guidance to less successful language learners.

Based on a number of interviews with good learners, Rubin (1975) pointed out some characteristics of a good language learner which are being a good guesser, having a strong drive to communicate, not being inhibited, being prepared to attend to the form of language, seeking out opportunities to practise using the language, monitoring their own speech and that of others and paying attention to meaning. However, the rate of success also depends largely on some other variables, such as the task, the learning stage, the learner's age, the learner's individual styles, and cultural differences in learning styles. Rubin's study gives some insights into learners' cognitive processes as well as raising the teacher's awareness of the role of learners' strategies and their significant contribution to the learning process.

Stern (1975) published a paper later in the same year which comprises of a list of ten strategies for good language learners as a result of the project "Effective Language Teaching and Learning" at the Modern Language Centre of the Ontario Institute for Studies in Education.



The bases for his categories derived from his reading and his experiences as a language teacher as well as a learner himself. As quoted by Naiman et al., (1978; reprinted 1996) these strategies include:

1. **Planning Strategy**  
A personal learning style or positive learning strategy.
2. **Active Strategy**  
An active approach to the learning task.
3. **Emphatic Strategy**  
A tolerant and outgoing approach to the target language and its speakers.
4. **Formal Strategy**  
Technical know-how of how to tackle a language.
5. **Experimental Strategy**  
A methodical but flexible approach, developing the new language into an ordered system and constantly revising it.
6. **Semantic Strategy**  
Constant searching for meaning.
7. **Practice Strategy**  
Willingness to practice.
8. **Communication Strategy**  
Willingness to use the language in real communication.
9. **Monitoring Strategy**  
Self-monitoring and critical sensitivity to language use.
10. **Internalization Strategy**  
Developing L2 more and more as a separate reference system and learning to think in it.

Naiman et al. (1978) carried out a study on the Good Language Learner (GLL) to identify the strategies employed by successful language learners. Stern's strategies above were developed as a major source of reference. The study is in two parts. The first involves in-depth interviews with adult learners. As for the second study, several high-school students were asked to complete a questionnaire on personality, attitude and achievement measures. They were also observed in their classroom, and were then interviewed.

In the study, 34 interviews were selected based on the interview questionnaire about their second language learning experiences. The interviews were analysed where learning strategies and techniques were identified. Finally, they revealed five strategies to be crucial and contribute greatly to the success of language learning. According to Naiman and his colleagues, good language learners:

- (1) actively involve themselves in the language learning process by identifying and seeking preferred learning environments and exploring them,
- (2) develop or exploit an awareness of language as a system,



- (3) develop and exploit an awareness of language as a means of communication and interaction,
- (4) accept and cope with the affective demands of their L2 learning,
- (5) extend and revise their L2 systems by inferencing and monitoring

Apart from the five general strategies mentioned above, this study also provided a list of techniques the interviewees developed to help them improve their language capacity in pronunciation, vocabulary, and other language skills. These language techniques are useful and provide some insights into further studies on second language learning strategies. Despite the major criticisms of the interview study due to lack of a comparison group of “bad” language learners, the study has been praised for its in-depth analysis of the language learner.

After the study on the strategies of successful learners in 1975, Rubin’s (1981) study aimed to explore students’ cognitive processes. She collected data from a variety of sources, including interviews, diaries and classroom observations. As a result of her studies, she proposed two cognitive processes contributing to language learning which are direct and indirect processes. Monitoring and guessing are considered to be direct processes, while creating opportunities for practice and using production techniques are considered to be the processes that have an indirect contribution towards learning. Rubin’s classification scheme in cognitive processes has been recommended by Wenden (1983) to be used for future research with some necessary refinements as required by the nature of the data.

Bialystok (1981) carried out a study to identify and investigate the conscious strategies used by high school foreign language students in relation to their achievement in various tasks. The three types of strategies include practising, monitoring and inferencing. The results of the findings suggest that role of conscious strategies has a vital role to play in the classroom and the use of strategies is heavily dependent on the students’ attitude rather than their aptitude.

The literature on good language learners has influenced many following studies including Politzer’s (1983). This study involves a group of 90 university students ranging from elementary, intermediate, to advanced levels. In the study, students were asked to complete a questionnaire which comprised of selected learning behaviours based on strategy use by good language learners. The questionnaire aims to explore three aspects of the general strategies students use, their classroom behaviours and their social interaction outside class.



The data are then analysed and relationships between these three variables, students' grades as well as instructors' evaluation are identified. Based on the results, some relationships between particular language learning behaviours and learners' achievements can be identified although they vary in terms of other contributive factors, such as learning contexts, teaching methods and course level. In his study, Politzer (1983) examines the relationship between student characteristics and teaching methods and states that this relationship they should be taken into consideration in future research into learning behaviours.

Connected with the previous notion that good language learners use learning strategies to facilitate their learning, O'Malley, Chamot, Stewner-Manzanares, Kupper, and Russo (1985a) carried out a study in order to identify the range and frequency of strategy use among ESL students at beginning and intermediate levels, and investigate if an association can be made between the actual learning strategies and the existing learning categories. Moreover, the study aims to determine the connection between the students' strategy use and the nature of the language tasks as well as their level of proficiency.

Based on the Student Interview Guide, 70 students were interviewed in small groups to find out their use of learning strategies in various tasks, such as pronunciation, grammar, vocabulary, following instructions, listening, making a brief presentation in class, etc. The data gained from the interviews provide very useful information compared to the interviews with the teachers and classroom observations which were later discarded during the analysis process.

The results can be summed up as follows. First, the interviews with students at both beginning and intermediate levels use a wide range of learning strategies. In order to cope with extensive use of strategies, a new learning strategy classification scheme has been set up which consists of metacognitive, cognitive and social mediation categories. Each of these categories has been divided into sub-categories. For example, the metacognitive category is sub-divided into advance organisers, directed attention, selective attention, self-management, advance preparation, self-monitoring, and self-evaluation.



As found in the study, more metacognitive strategies were used more frequently among the students in the intermediate group, while the beginners used more cognitive strategies although the analysis of the learning strategies suggests that students in both groups, tended to use fewer strategies in more demanding tasks. One surprising aspect of the results is the amount of metacognitive awareness the group of researchers found among these ESL students in spite of their early stage in second language acquisition. Finally, O'Malley et al. (1985a) emphasise the role of strategy instruction as a powerful learning tool in helping students to learn more effectively.

The work carried out by O'Malley et al. (1985a) has been considered to be innovative as it has brought some changes by adding new categories to the existing learning strategy scheme as well as setting up a new language learning framework which has been one of the influential bases in the area of learning strategy use and strategy training. According to O'Malley et al. (1985a), "Students without metacognitive approaches are essentially learners without direction and ability to review their progress, accomplishments and further learning directions" (p. 24). O'Malley and Chamot's (1990) updated learning strategy framework, upon which this current study is based, has been discussed earlier in Section 2.2.3.2.2.

Based on semi-structured interviews with a group of 25 adult language learners, Wenden's (1986b) study aims to investigate the knowledge about their own learning experience. This kind of knowledge reflects an aspect of metacognition which is also referred to as "metacognitive knowledge" by Flavell (1979, 1985). The notion of metacognition will be discussed in Section 2.3.2.

In this study, Wenden (1986b) aims to investigate what aspects of language learners can talk about, apart from their learning strategies. After a content analysis of data of the interviews, five main areas of knowledge were found which included: (a) the language; (b) their proficiency in the language; (c) the outcome of their learning endeavours; (d) their role in the language-learning process; and (e) the knowledge in handling the task. Learners' statements reflecting these five aspects of their learning were classified respectively into: (1) designating; (2) diagnosing; (3) evaluating; (4) self-analysing; and (5) theorising.



These five dimensions of learners' knowledge were then compared with Flavell's (1979) metacognitive knowledge theory regarding person, task, and strategic categories and some similarities were identified. Wenden (1986b) concludes, "It is not enough that we strive to help language learners diversify their repertoire of strategies. A critical and informed awareness is necessary for the artful use of acquired skills" (p. 199).

Another study by Wenden (1986a) on the notion of learners' beliefs with a larger number of 34 language learners reveals that the beliefs learners have about their learning influence the way they act to help them learn. Wenden (1986a, p. 10) comments, "Activities that help them reflect on their learning and articulate their unstated beliefs should help develop these important metacognitive skills and, consequently, allow them to assume more control over their learning." It can be said that Wenden's studies have shed some light on the two notions of metacognitive knowledge and a regulatory process.

Chesterfield and Chesterfield (1985) carried out a study to investigate a range of strategies as well as the development of their use as found in verbal interactions among 14 Mexican-American children in bilingual classrooms. The methods of data collection included: participant observation, field notes on children's behaviours and recorded samples of classroom discourse. Data were collected at the beginning and end of their preschool year as well in their first grade. The results of the study reveal that not only language learning strategies are commonly used among children in bilingual classrooms, but these strategies are also developed naturally over time. However, the amount and the range of strategies used are dependent on children's level of proficiency. More proficient children used a wider range of language learning strategies. It was suggested that activities like problem-solving exercises should be introduced in language classrooms as they help to develop children's strategy use and finally lead to the development of strategic competence.

The study conducted by Politzer and McGroarty (1985) aims to describe learning behaviours and relate them to the two major aspects of students' differences regarding their fields of specialisation and cultural backgrounds. The study involves a group of 37 ESL students attending an eight-week intensive course in the United States. Almost evenly split, the two major groups are learners of Asian and Hispanic origin.



The questionnaire used in the study has been developed from the notion of good learning behaviours and divided into three categories of, firstly, classroom study, secondly, individual study and thirdly, social interaction outside of the classroom. Data gained from the questionnaire was analysed in relation to students' cultural background and their academic field (Engineering/Science versus Social Science/Humanities).

The results of the average scores of the three categories suggest that the gains are significantly higher in the Hispanic group. A number of assumed "good" strategies as found in the first and third categories were not used by Asian students in the study. The Engineering/Science students also engaged less in using good learning behaviours, while the gains of Social Science/Humanities show a much higher rate. However, the Asian students outperform the Hispanics in relation to linguistic competence and communicative competence. It should be noted that the findings of the study that involves students with different cultural backgrounds should be treated with caution as some other factors, e.g., students' individual learning behaviours, might play a role as suggested earlier in Politzer (1983).

While numerous studies have been carried out to investigate the strategies employed by good/successful language learners, a study carried out by Vann and Abraham (1990) has targeted at investigating the strategies used by two female Saudi Arabian women who were classified as low-proficiency language learners. Data was based on think-aloud protocols and task products while they were engaged in four language activities (an interview, a verb exercise, a cloze passage and a composition). It was reported that these learners used strategies frequently but sometimes inappropriately as they did not take into account the meaning of the whole text.

Based on Oxford's proposed strategy systems as discussed in Section 2.2.3.1, the Strategy Inventory for Language Learning or SILL (reprinted in Oxford, 1990) was developed to be used as a tool for assessing the frequency of use of language learning strategies. The SILL which is a self-report questionnaire listing the use of strategies under memory, cognitive, compensation, metacognitive, affective and social categories, comes in two versions, Versions 5.1 and 7.0 (ESL/EFL). The first version is designed for foreign language learners whose native language is English (80 items), while the latter version is for learners of English as a second or foreign language (50 items). Due to its high standard of reliability and validity, the



EFL/ESL version of SILL claims to be the most widely used strategy research across many cultural groups currently (Oxford & Burry-Stock, 1995, Peacock & Ho, 2003).

A number of SILL research projects have focussed on making comparison across strategies in the six categories, while some relate strategy use to gender as well as to L2 proficiency level. A study by Mullins (1992) as quoted in Peacock and Ho (2003) was carried out with a group of 110 Thai university EFL students by using Oxford's SILL. The results show a positive association between the use of compensation and metacognitive strategies and their proficiency.

The next SILL research was carried out by Green and Oxford (1995). The study investigated patterns of variation in overall strategy use by 374 Puerto Rican ESL university students who were attending English Courses at three different levels (Prebasic, Basic, and Intermediate). The results reveal a close relationship between strategy use and successful learning; more efficient learners use more learning strategies than less successful ones. Different groups of learners, especially Prebasic students compared with the other two groups, show different types of strategy use. Seventeen out of 50 strategies was found to be used more significantly by more proficient students. Regarding the issue of gender, female students used strategies more often than males in the memory, metacognitive, affective and social categories. Green and Oxford (1995) suggest that students should be made aware of the wide range of strategies they can make use of as well as encouraged to use more of the strategies involving naturalistic practice and active use of the target language. Due to the fact that learners possess different characteristics regarding their level of proficiency and gender, teachers should also be aware of the differences in strategy choices they make.

Peacock and Ho (2003) used Oxford's SILL with 1,006 EAP students in a university in Hong Kong. These students come from 8 different academic disciplines in building, business, computing, engineering, English, mathematics, primary education and science. Among them, 51% were male and 49% were female. The study aimed to investigate findings concerning the issue of strategy use in relation to learners' academic discipline, age, gender and level of proficiency. Apart from the regular use of the self-report questionnaire on language strategy use, semi-structured interviews were also conducted with a small number of students representing each discipline. This was done in order to gain insights regarding the reasons behind their choice and frequency of use of specific strategies.



After data analysis was completed, it has been found that the compensation category gains the highest use of all, followed by cognitive and metacognitive, then social, memory and affective strategies. The highest use of strategies was reported from English students, while the lowest was from computing students. In all six categories, female students report significantly higher use of strategies than males.

Moreover, mature students report higher use of strategies in comparison with younger ones. Some of the implications which can be drawn from the study are that because teachers play a key role in providing strategy training to students and they need to know about both the strengths as well as the deficiencies of strategy use so that they can be selective about which language learning strategies are needed to be taught.

To sum up the findings carried out in previous SILL studies conducted to establish the relationship between strategy use, proficiency level and gender, Peacock and Ho (2003, p. 182) point out some common findings drawn from the SILL research which are as follows:

1. The most frequently used categories are compensation, cognitive, and metacognitive.
2. There is often a positive association between strategy use and proficiency.
3. Frequency of strategy use is often higher for females.
4. Frequency of strategy use is often higher among humanities students than among science and engineering students.

### **2.2.5.2 Research on Language Strategy Training**

McDonough (1995) suggests a distinction in studies on language strategy training can be made between general and specific groups. While studies in the general group involves teaching learning strategies in general language skills, the focus in the specific group is on teaching particular strategies, namely, reading comprehension, vocabulary learning. Although both groups do share some similarities, studies of each group will be discussed separately. The discussion about the general group is dealt with in this section, whereas the studies on reading strategies training will be discussed in Section 2.3.4.2.



One experimental intervention was conducted by O'Malley, Chamot, Stewner-Manzanares, Russo, and Kupper (1985b) to investigate the effects of integrative language skills training taking place in a natural classroom setting. The language skills represented students' academic tasks in the areas of listening, speaking and vocabulary learning. The participants were 75 ESL high school students, at an intermediate level of English proficiency, consisting of different backgrounds from Spanish-speaking countries, Asian countries, and from other language backgrounds.

As an experimental study, these students were randomly assigned into one of the three groups (metacognitive group, cognitive group, and control group). In the metacognitive group, the instruction was based on providing training in metacognitive, cognitive, and social/affective strategies, while only cognitive strategies and social/affective strategies were taught in the cognitive group. The control did not receive strategy training, but some special reading instruction was provided. Some isolated strategies included in the metacognitive group were self-evaluation, imagery and grouping, selective attention, note taking, cooperation, etc., whereas the metacognitive strategies, for example, self-evaluation, selective attention, were excluded in the cognitive group.

At the end of the training period, data which were analysed according to the three different language tasks in speaking, listening, and vocabulary learning, provided mixed results. Based on statistical analyses, the students' speaking skill in the metacognitive group outperformed the two other groups significantly.

However, the results in listening skill were not found to be of significance in some subject areas, such as geography or science lessons. Moreover, the results on the vocabulary test did not show significant differences among the treatment groups.

After analysis of the data according to the students' ethnic groups, it was found that the Hispanic groups who received strategy training outperformed those Hispanic students who were in the control group, while the control Asian group outperformed both training groups with no strategy training. As discussed by O'Malley and his associates, this was due to the use of rote learning and not unwillingness to change. Finally, this study suggests that strategy training has a role to play in improving academic language skills.



Research on strategy training is also investigated in relation to the strategies employed between different groups of learners. White's (1995) study was carried out to compare the strategies of distance and classroom foreign language learners in French, German, Japanese and Chinese. Data was based on the use of questionnaire and think-aloud verbal reports. The issues of learners' autonomy in relation to their use of learning strategies in two different learning environments are explored. A self-report questionnaire which was developed based on the O'Malley and Chamot's (1990) three main categories of strategy use was administered to 143 classroom learners and 274 distance learners.

Reported strategy use showed that mode of study has an effect on dimensions of strategy use. Classroom learners were found to use more cognitive strategies than metacognitive strategies in their language learning, and used more social strategies than affective strategies. The opposite was found among the group of distance learners as they were in favour of metacognitive strategies and social strategies in comparison with cognitive and affective strategies respectively. Regarding metacognitive strategies, the dimensions of monitoring and evaluation were found most used among distance learners which included comprehension monitoring and problem identification. This was owing to the fact that distance learners did not have teachers' support in giving guidance or supervision. Therefore, they had to find out if the material matched their comprehension abilities as well as monitor their understanding by themselves. Based on the results from the questionnaire as well as the verbal report, White (1995) states that the main difference in terms of strategy use lies in the use of self-management and concludes that the dominant use of metacognitive strategies in planning, monitoring, and evaluation among distance learners leads them to develop more autonomous concepts.

Two longitudinal studies conducted by Chamot et al. (1996) were based on the investigation of the feasibility of conducting strategy training: one with high school and college Japanese students and the other one with Russian and Spanish students in high school beginner and intermediate levels. Both studies involved a number of high school teachers and students and took three years (1990-1993) to complete. Instructional materials and lessons were designed to integrate learning strategies in classrooms.



Moreover, guidelines for teachers which include explanations, steps and suggestions in how strategies should be taught were provided. Research tools included questionnaires, language proficiency tests and a Teacher Ranking Scale which was developed by teachers and researchers to be used in ranking the student's proficiency levels. The results regarding strategy identification found that there was a close relationship between learning activities and the choice made in choosing what strategies to be taught in classroom. Teachers have a significant role since they are the ones who implement the instruction as well as develop lessons themselves. A problem-solving process model was initiated in the study which combined some key strategies of planning, monitoring, problem-solving and evaluation. Moreover, the notion of metacognitive knowledge was also shared among teachers and students. Based on the interviews and class observations, both studies were found to be a success. Teachers felt the instruction had an effect in improving students' proficiency, while students found the strategy instruction helpful in improving their learning.

Dadour and Robbins's (1996) study highlighted the distinction between two broad categories of strategy training: direct (strategy-plus-control) and embedded (blind) instruction. While the value and purpose of strategy instruction are made explicit to learners as well as strategies' names in direct strategy instruction, no such information is given in the embedded instruction. Dadour and Robbins carried out two studies which aim to investigate the effectiveness of strategy instruction on developing the speaking competence of university students in Egypt and Japan.

The first study which took place in Egypt is quantitative-oriented, while the second one is more qualitative. The nature of the first study is of an experiment, in which a group of 122 university students were randomly divided into control and experimental groups. As for the strategy instruction course, learners were provided with instruction on how to use learning strategies more effectively.

During the period of 15 weeks, the sessions in the experimental groups were in the sequence of (a) warm-up, (b) students' presentations and discussions of home assignments, (c) teacher's presentation and explanation with example of new strategies, (d) activities for practicing the new strategies and for discussing them, and (e) home assignments for group work.



At the end of the course, the students in the experimental group were found to be more fluent in their vocabulary usage and grammar than the control group. Moreover, there were significant differences in terms of strategy use between the two groups with the experimental group reported more frequently use of strategies in all major SILL categories. Dadours and Robbins (1996) conclude that a strategy instruction course has positive effects on learners' speaking competence.

The second study took place in Japan in which a group of 50 university students were involved during a three-month period. The strategy instruction was based on the Problem-Solving Process, in which learning activities are broken into four basic processes; planning, monitoring (regulating), problem-solving, and evaluation. The teacher modeled and presented strategies by using a think-aloud technique. Explanations were given to students why particular strategies were appropriate. At the end of the course, most students felt positive about strategy training and made considerable improvement in their speaking skills.

With reference to the success of strategy instruction from both studies, Dadour and Robbins (1996) make a remark that, "Though strategy instruction was not a 'magic pill' to improve anyone's speaking ability, it was an effective means of enhancing foreign teaching and learning" (p. 166).

A pilot strategy instruction study was conducted by Yang (1996) with 68 first-year students in two major universities in Taiwan. The English Learning Questionnaire adapted from the SILL was used to measure and compare strategy use at the beginning and at the end of the term. Additionally, a Group Interview Question Guide was used in group interviews, in which the students were asked about techniques or strategies they used in six language learning tasks of (a) vocabulary learning, (b) listening comprehension, (c) reading comprehension, (d) writing compositions, (e) oral presentation, and (f) communicating in English.

After the training, the results of the pre- and post questionnaires showed improvement in terms of range and frequency of strategy use. Based on the interviews, a number of strategies were reported by students, among which strategies in advance organisers, selective attention, repetition, and seeking assistance were found to be used more often than others. Details on and reasons how students used them were also provided.



Previous studies in this section suggest that strategy training provides mixed results. For example, while the students' speaking performance improved significantly after the training, their performance in listening did not show significance effects as found in O'Malley et al. (1985b). This leads to a conflicting view among researchers on the issue of whether learning strategies should be taught.

In relation to the use of communication strategies which are defined by Kellerman (1991) as "a subset of types of referential behaviour found among both first and second language users" (p. 15), some conflicting views do exist.

Concerning the issue of training, some researchers believe that learners process strategic competence in the first language and can transfer it into a second, others see them as not readily available in L2 and there is a need to teach them in the classroom. However, none of them proposes strategy training as an option.

Kellerman (1991) requests evidence to prove that a difference regarding the use of strategies between native and non-native strategic competence exists. The results from previous studies suggest that there is no need for conducting training in compensatory strategies to learners as no significant difference is found in relation to the way learners use strategies while engaging in tasks in L2 or L1. As pointed out by Kellerman (1991, p. 158), "Teach the learners more language and let the strategies look after themselves".

Likewise, Rees-Miller (1993) expresses concerns over the claim of the positive effect of strategy training and urges that more empirical data especially in the form of longitudinal studies are needed to validate such a claim. As pointed out by Rees-Miller (1993, p. 680) "It is fundamental tenet of learner training that learning strategies of successful learners can be codified and taught to poor language learners with a resulting increase in their learning efficiency"

However, this view has been challenged with by Oxford and Leaver (1996) who state that less successful language learners will not be able to develop their language proficiency by simply adopting good strategies as used by more successful language learners. Due to individual differences, weaker learners are simply guided and made aware of the range of strategies they can make use of by teachers. Oxford comments, "Strategy training is a highly creative, multilevel process for teaching students to optimize their learning strategies for themselves as individuals" (p. 228).



In response to several questions posed by Rees-Miller (1993), some key concepts identified by Chamot and Rubin (1994) can be summed up as follows: learning strategies vary across learners; good strategies are made up of a personal set of effective strategies. Moreover, learners' use of strategies varies according to their proficiency level, task, text, background knowledge, etc. Finally, some of the factors including the length of strategy instruction, the strategies' integration, the selection of materials, and the teacher instruction have to be taken into consideration when conducting strategy training. In the following sections, issues regarding reading strategies and reading strategy training will be discussed.

### **2.3 Reading Strategies**

Recent research views reading comprehension as a “constructive process” in which readers make use of metacognitive strategies and cognitive strategies to help with their understanding of the text (Dole, Duffy, & Pearson, 1991). This view is supported by Allen (2003, p. 320) who points out that skilled and proficient readers regardless of their age use a variety of strategies to help understand the meaning of the text. Regarding the relationship between language learning strategies and reading strategies, Allen (2003) points out that,

Reading strategies have much in common with learning strategies, but readers deliberately use them to better understand and remember what they read. By using reading strategies, all students, including L1 and L2 students and those with special needs, can learn to read independently and well. (p. 322)

#### **2.3.1 Definitions of the Terms**

The definitions of strategies and learning strategies have been discussed earlier in Section 2.3.2. In this section, the more specific meanings of reading strategies as well as the classification of metacognitive, cognitive and social/affective strategies within the reading context are discussed.

Olshavsky's (1977) study, which is one of the earliest studies in first language reading has defined the term strategy as “a purposeful means of comprehending the author's message” (p. 656). It is later defined by Pritchard (1990, p. 275) as “a deliberate action that readers take voluntarily to develop an understanding of what they read.”



With an emphasis on readers' consciousness, Cohen (1998, p. 5) points out that "the element of consciousness is what distinguishes strategies from those processes that are not strategic." According to Cohen (1990, p. 83) reading strategies are "those mental processes that readers consciously choose to use in accomplishing reading tasks."

Regarding the differences between the terms skills and strategies, Urquhart & Weir (1998, p. 96) make a fine distinction that "Strategies are reader-oriented, skills are text-oriented." In other words, strategies are conscious steps taken by readers, while skills are used unconsciously as they have reached the level of automaticity.

This agrees with the view of Williams and Moran (1989, p. 223) who define a skill as "an acquired ability, which has been automatized and operates largely subconsciously, whereas a strategy is a conscious procedure carried out in order to solve a problem."

According to Carrell, Pharis and Liberto (1989, p. 648), "reading strategies are of interest for what they reveal about the way readers manage their interactions with written text, and how these strategies are related to reading comprehension." As summed up by Allen (2003, p. 321), the term strategy is used to mean "a step or action that is designed to enhance learning, that is not automatic, and that is deliberately chosen by the learner and applied to a learning task."

Singha (2001) provides brief descriptions of metacognitive strategies as behaviours undertaken by learners to plan, arrange, and evaluate their own learning, while cognitive strategies are used by the learners to transform or manipulate the language. Lastly, social strategies are those that involve other individuals in the learning process. In this study, the term strategy refers to "all actions taken by readers to maximize their reading potential". With some modifications, the reading strategies under the categories of metacognitive, cognitive, social and affective strategies are defined as follows:

Metacognitive strategies are attempts or initiations readers consciously take to facilitate their reading process. They include making a plan, monitoring and checking their understanding.

Cognitive strategies are steps readers take while engaging in the reading process to maximize their comprehension by making use of their available resources, previous knowledge or experience.

Social/affective strategies are methods readers use when having reading problems. This can be done through interaction or cooperation with others.



### 2.3.2 Metacognition

Although the notion of metacognition has been a key issue in cognitive theory for many decades (Flavell 1985), it was not until the late 1970's that it was acknowledged within the context of reading. Generally, the term "metacognition" has been used by researchers in various disciplines and it is also referred to as metamemory, metacomprehension, and metaperception (Garner, 1998). Metacognition initially dealt with children's knowledge of memory processes and has been expanded to include the concepts of awareness of comprehension, problem solving, memory and social cognition.

The concept of metacognition in the following discussion is based on what was initially proposed by Flavell (1976, 1979, 1985) and followed by some relevant issues in relation to language learning and reading. According to Flavell (1976), the term metacognition has been defined as "one's knowledge concerning one's own cognitive processes and products or anything related to them, e.g., the learning-relevant properties of information or data" (p. 232). Flavell (1985, p. 104) points out that its overall meaning can be interpreted as cognition about cognition. Regarding application within the reading context, it has been defined as "knowledge about our own thinking and learning" (Casanave, 1988, p. 288) and "one's understanding of cognitive processes" by Brown, Armbruster and Baker (1986, p. 49).

Garner (1998) proposes that if meanings of cognition include processes of perceiving, understanding, remembering, etc., metacognition in this view can also be viewed as "thinking about one's own perceiving, understanding and the rest" (p. 716). Flavell (1985) sees each cognitive process as complexly interrelated with one another during real-time function and points out that, "Each process is believed to play a vital role in the operation and development of each other process, affecting it and being affected by it. This idea of mutual, two-way interactions among cognitive processes is an exceedingly important one" (p. 3). The notion of metacognition is believed to highlight an individual's awareness of cognitive processes and strategies. In relation to a language context, metacognitive skills are found to be helpful in many learning activities, some of which include oral comprehension, reading comprehension, writing, language acquisition, etc. (Flavell, 1985).



With regard to the concept of metacognition, a distinction between *metacognitive experiences* and *metacognitive knowledge* can be made (Flavell, 1985). According to Flavell (1985, p. 107), metacognitive experiences refer to “cognitive or affective experiences that pertain to a cognitive enterprise.” The levels of experiences range from fully conscious to less fully conscious and they can also take place before, during, or after a cognitive endeavor. As applied to reading, metacognitive experiences are helpful functions as they help to provide a reader with some feedback so that adaptive actions can take place in the case when the reader realises that comprehension does not take place. Some of the adaptive actions as suggested by Flavell (1985) include rereading the passage, reading ahead or modifying the task objectives to minimise any problems which occur.

Metacognitive knowledge refers to the segment of one’s stored world knowledge that deals with cognitive matters (Flavell, 1979, 1985). In the language context, the term “learner beliefs” has been proposed by Wenden (1999, p. 436) to be used interchangeably with metacognitive knowledge as it helps to highlight the roles of learners’ characteristics and their beliefs in the process of learning. This is supported by Flavell (1985) in accepting the view that beliefs about learning are an aspect of metacognitive knowledge. Wenden (1999) has the view that metacognitive knowledge changes over time in accordance with learners’ maturity, while Flavell (1985) points out that some of the accumulated knowledge is reflected through a combination of declarative and procedural knowledge which can also be referred to as “knowledge that” and “knowledge how” respectively.

In relation to the reading context, both types of knowledge are found to be important factors which contribute towards strategic reading (Paris et al., 1998). While declarative knowledge includes one’s belief about the task and one’s reading abilities, procedural knowledge involves a wide range of some actions which may take place during the reading process, such as skimming, scanning, summarising, etc. Paris et al. (1998) point out that it is through procedural knowledge that reading strategies can develop.

According to Flavell (1979, 1985) metacognitive knowledge is subdivided into knowledge about persons, tasks, and strategies, each of which is discussed in the following section.



First, the person category which refers to any knowledge and beliefs one might acquire concerning the concept of human beings as cognitive processors can be furthered subcategorised into the three sub-categories of knowledge and beliefs about firstly, cognitive differences within people, secondly, cognitive differences between people, and thirdly, cognitive similarities common to all people (Flavell, 1985). The same concepts have been referred to by Garner (1998) and Wenden (1998) as intraindividual differences, interindividual differences, and universals of cognition.

According to Wenden (1998), the general knowledge acquired by learners enables them to know what helps to promote or what obstructs the learning process. Some of the cognitive and affective variables, such as age, language aptitude, motivation, etc., are also considered to play a role in forming knowledge about perception of themselves as learners. Moreover, person knowledge includes learners' beliefs about their own effectiveness and about their ability to achieve particular goals in language learning.

Next, the task category involves one's knowledge about the cognitive-processing of information of the task provided as well as demands required to complete the task (Flavell, 1985). The understanding of task requirements helps to determine how particular cognitive enterprise should best be handled and how likely it is that the goal can be achieved (Flavell, 1979). In other words, as pointed out by Wenden (1998), task knowledge is used in order to determine the knowledge learners have about the task which then will lead to the completion of a particular task.

Lastly, the strategy category provides a choice in choosing what strategies are likely to be effective in achieving cognitive goals. A further distinction in strategies can be made between cognitive and metacognitive strategies. As stated by Flavell (1985), the main function of a cognitive strategy is to help one achieve particular goals in any cognitive activities one is involved in, while the main function of a metacognitive strategy is to provide one with information about the enterprise or one's progress in it. As summed up by Flavell (1985, p. 106), "Cognitive strategies are evoked to make cognitive progress, metacognitive strategies to monitor it."

The term "strategic knowledge" as suggested by Wenden (1998, p. 519) has an important role to play in the processing of language learning by lending itself to the concept of the learning strategies of foreign and second language learners.



In order to have a better understanding of metacognitive knowledge, Brown, Bransford, Ferrara & Campione (1983) point out there is a need to make a distinction between metacognitive knowledge and metacognitive strategies. As summed up by Wenden (1999, p. 436), the first refers to “information learners acquired about their learning”, while the latter are general skills learners employ to manage, direct, regulate, and guide their learning. The use of the three strategies of planning, monitoring and evaluating are labelled under the umbrella term of “self-regulation” in the field of cognitive psychology or “self-direction” when reference is made to the concept of learner autonomy in foreign/second language learning (Wenden, 1998). Metacognitive knowledge is considered to be a pre-requisite to self-regulation because it provides the knowledge needed so that learners can plan, monitor, and evaluate their use of strategies more effectively.

Baker and Brown (1986) point out the Flavell’s definition of metacognition conveys two clusters of “knowledge about cognition and regulation of cognition” (p. 354). While the first cluster refers to one’s own cognitive resources combining the learner and the learning situation, the latter refers to self-regulatory mechanisms to be used by a proficient learner when dealing with reading problems, some of which includes planning one’s next move, monitoring the effectiveness of any attempted action, revising and evaluating one’s strategies for learning (Baker & Brown, 1986).

Metacognitive knowledge has a key role to play in enabling learners to cope with cognitive activities related to language use. As pointed out by Flavell (1979), metacognitive knowledge is sometimes called upon deliberately by learners when dealing with a new task or when accuracy is demanded of them. However, it may appear automatically or sometimes without learners themselves being aware of it.

Although the three factors or variables of person, task and strategy have different elements, each is rarely operated in isolation. This view is supported by Flavell (1985) who points out that metacognitive knowledge involves combination of two or three of the three types of variables, and the same can be said about the relationship between metacognitive knowledge and metacognitive experiences as they are believed to interact with one another to influence cognitive activities.



According to Wenden (1999), numerous studies carried out on learning strategies are examples of how metacognitive knowledge has been an important variable in language learning. These studies reflect the role of metacognitive knowledge which comes into play in the regulation of learning tasks.

As pointed out by Flavell (1985, p. 110), metacognition is considered to be a “tool of wide application” gaining interest and popularity in various academic fields. Moreover, it is also based on the belief that metacognitive skills play a crucial role in the teaching of reading and need to be taught directly in the classroom to maximise their potential. This supports Collins’ (1994) view that metacognitive skills can be learned through instruction and teachers can encourage students to take an active role in reading. The notion of reading strategy instruction is discussed in the next section.

### **2.3.3 Framework of Reading Strategy Training**

A strategy-based approach is seen as an alternative way of teaching reading in contrast to skills approaches. It is based on the belief that “Reading is a unitary process which cannot be subdivided into constituent skills” (Wallace, 1992, p. 52). The basic principle in reading strategy training is to encourage learners to use strategies which are used by good readers. As suggested by Anderson (1999, p. 70), the teaching of reading strategies has been “a prime consideration in the reading classroom.” Allen (2003, p. 335) also states,

Research consistently shows that using strategies greatly enhances comprehension of the written word. Without strategies to deal with everything from decoding to transfer, most students will have a more difficult time than necessary grasping the meaning of what they read.

The three methods of teaching reading comprehension strategies as suggested by Allen (2003) include Reciprocal Teaching Approach (RTA), Transactional Strategy Instruction (TSI), and Cognitive Academic Language Learning Approach (CALLA). Although these three types are based on the concept of constructivism which proposes that readers read and construct the meaning of the text by relating to their background knowledge, each design slightly differs in itself. Allen (2003) explains the difference as follows:



For the Reciprocal Teaching Approach, the designers were researchers who were interested in using cooperative groups and specific strategies to help students search for meaning in the text. Transactional Strategy Instruction creators were primarily educators rather than researchers, and they were concerned with producing strategy-based interventions to use with groups working on academic tasks. (p. 333)

In contrast, some of the common ground they share is that all three approaches view learning strategies as an integral part of the reading process and that students' awareness of both metacognitive and cognitive strategies is emphasised. Moreover, the social and affective strategies have a role to play in reading instruction as they help motivate students to read. Lastly, direct modelling and explicit instruction are conducted in the classroom. Allen (2003) also points out that based on previous strategy training, each method has been proved to enhance the learning of reading as well as other language skills.

Pearson and Dole (1987) suggest four different phases in how to conduct reading strategy instruction which include teacher modelling and explanation of a strategy, guided practice during which teachers gradually give students more responsibility for task completion, independent practice and feedback, and application of the strategy practice in real reading situations. After strategies have been explained, teachers can show students how to apply the strategies taught with other reading tasks.

In EAP reading classes, Shih (1992) suggests the strategies should be introduced through different stages of prereading, during-reading, and postreading. Moreover, some suggested instructional steps in teaching reading comprehension begin with direct explanation and modelling to guided practice, and independent applications.

In teaching main idea comprehension, Anderson (1999) cites Winograd and Hare (1988) in suggesting the six strategy questions which are as follows:

- (1) What is the strategy?
- (2) Why should the strategy be learned?
- (3) How can the strategy be used?
- (4) When should the strategy be used?
- (5) Where should the reader look?
- (6) How can you evaluate the use of the strategy?



Singhal (2001) raises an awareness that readers are different in the way they use strategies. Therefore, to conduct successful reading instruction, some attention should be paid to the role of individualisation regarding learners' strengths and weaknesses. Moreover, two important points must be taken into consideration. First, the content of the strategy lesson must be of interest to learners. Second, reading strategy lessons are most effective when they are directly relevant to learners' needs and enable to help them to solve their reading difficulties. Singhal (2001) suggests the following guidelines for effective reading strategy training.

1. Teachers must care about the processes involved in reading and studying, and must be willing to devote instruction time to them through direct-strategy-instruction and modeling.
2. Teachers must do task analyses of strategies to be taught. In other words, teachers must think about how a particular strategy is best applied and in what contexts. Teachers can observe students as they read in order to determine students' strengths and weaknesses in terms of strategy use, which in turn will help in providing effective and appropriate strategy instruction.
3. Teachers must present strategies as applicable to texts and tasks in more than one content domain so that strategies can be applied in a variety of reading situations and contexts.
4. Teachers must teach strategies over an entire year, not just in a single lesson or unit allowing strategic instruction to permeate the curriculum.
5. Teachers must provide students with opportunities to practice strategies they have been taught.
6. Teachers must be prepared to let students teach each other about the reading and studying process.

Finally, details of the framework of reading strategy instruction based on O'Malley and Chamot's (1990) language learning scheme are discussed in the methodology chapter.

#### **2.3.4 Related Research on Reading Strategies**

The role of metacognitive awareness which includes the strategic awareness and monitoring of the reading process in reading comprehension has been the focal point in L2 reading research in recent decades. As defined by Sheorey and Mokhtari (2001, p. 433), metacognitive awareness of reading strategies refers to "the deliberate, conscious procedures used by readers to enhance text comprehension".



According to Sheorey and Mokhtari (2001), it is crucial to understand readers' metacognitive knowledge as well as how reading strategies are employed so that it helps in improving reading instruction to develop them into "active, constructively responsive readers" (p. 433).

Previous research done on reading strategies has equipped researchers and teacher educators with some useful implications in helping readers to improve in their awareness and use of reading strategies. Studies on reading strategy use are discussed in Section 2.3.4.1, while research carried out to investigate the effects of the reading strategy instruction is discussed in the following Section 2.3.4.2.

#### **2.3.4.1 Research on Reading Strategy Use**

The first of these studies was carried out by Hosenfeld (1977) to investigate the differences in the reading strategies between successful and unsuccessful second language learners. A group of 210 foreign language learners enrolled in level two French, Spanish and German classes took part in the study. Based on the results of the MLA Cooperative Test of Reading Proficiency, they were classified into high (scores range from 32 to 45) and low (scores range from 13 to 19). Think-aloud procedure was employed as a key research tool to gain verbal report data when working on several practice tasks. The strategies used among the two types of readers can be summed up as follows. A good reader keeps the meaning of the passage in mind as he reads, reads in broad phrases, skips inessential words, and feels positive about reading. In contrast, an unsuccessful reader fails to grasp the whole meaning of the passage, reads in short phrases, fails to ignore unimportant words, and has a negative self-concept as a reader.

Hosenfeld carried out another study in 1984 to identify different strategies used between good and poor readers. McDonough (1985) cites Hosenfeld's (1984, pp. 233-234) proposed additional strategies employed by successful readers as follows:

- guess from context the meaning of unknown words
- demonstrate sensitivity to a different word order
- examine illustrations
- read the title and make inferences from it
- look up words correctly
- continue if unsuccessful at decoding a word or phrase



- recognize cognates
- use their knowledge of the world
- evaluate their guesses

The use of cognitive strategies is explored in the study by Knight, Padron & Waxman (1985). This is to compare the type or frequency of cognitive reading strategies between monolingual and ESL students. Data was collected through interviews with 15 native speakers of English and 23 Spanish-speaking ESL students. In the process of collecting data, they were asked to read the text and stop at pre-marked intervals to explain about what reading comprehension strategies they were using. The results suggest that monolingual English students use more reading strategies than ESL students. The strategy of concentrating is found used most often among native-speaking readers, while the strategy of student's perceptions of teacher's expectations is most frequently cited by ESL readers.

Block's (1986) study investigated the use of comprehension strategies used by ESL non-proficient readers, and compared them with those employed by native speakers of English. All nine participants were first-year students enrolled in remedial reading courses at the City University of New York. The ESL students consisted of 3 native speakers of Spanish and 3 Chinese native speakers, and the other 3 were native speakers of English. They belonged to a homogeneous group based on the standardised reading test. In the study, they were asked to read two passages silently and stop to verbalise when they come to a red dot which was marked at the end of each sentence. They were also asked to retell the passages they read as well as answer multiple-choice questions after the think-aloud verbal report.

After the analysis of the protocol, two levels of strategies were drawn and referred to as *general comprehension* and *local linguistic* strategies. General strategies involve the use of comprehension-gathering and comprehension-monitoring strategies and include anticipate content, recognise text structure, integrate information, question information in the text, etc., These strategies reflect what readers do when they predict about incoming content, distinguish between main points and supporting details, connect new information to existing knowledge, question the significance of the passage they are reading, etc. Local linguistic strategies refer to attempts to understand specific linguistic units and some of which include paraphrase, reread, and question meaning of a clause or sentence, etc.



Block (1986) points out the strategies used among readers are represented by two major groups: integrators and nonintegrators. While the integrators tend to monitor their understanding more constantly and effectively, the nonintegrators rely more on their personal experience to help them read and relate pieces of information together as they read. The two patterns of strategy use are referred by Block (1986) as extensive and reflexive modes respectively.

Based on the results of the study, the following points can be made. First, the reading strategies used by ESL students and native speakers of English do not show significant differences in terms of types and patterns of strategy use which suggests that “strategy use is a stable phenomenon which is not tied to specific language features” (Block, 1986, p. 485). Second, there is a relationship between strategy use and students’ ability to learn. As reflected by the findings, the integrators’ average grade points are higher than those of the nonintegrators which suggest that they are more successful with their learning. Although Block’s definitions of integrators and nonintegrators are useful in giving distinctive patterns of strategy use, there is some concern if the distinctions drawn cater for a large number of readers (McDonough, 1995).

Block carried out another study in 1992 to investigate comprehension monitoring processes used by first and second language readers. Data was based on think-aloud verbal reports from 25 first-year college students. Based on their scores in a standardised reading test, two distinctive groups involving both L1 and L2 readers were identified: sixteen as proficient readers and the other 9 students as non-proficient readers.

The analysis of verbal protocols suggests the monitoring process falls into three sequential stages: evaluation of comprehension, action, and the checking of action. According to Block (1992), readers signal having a problem in the first stage by either making a statement which is referred to as problem recognition or taking some action to deal with it. The action stage involves strategic plan statement and action/solution. In other words, readers make a plan to solve the problem and act accordingly to solve it. The result of action is checked and a strategy is chosen in the final stage.



Regardless of being a first or second language reader of English, the success of the monitoring process depends largely on learners' proficiency in reading. The more proficient L1 and L2 readers are able to proceed through different stages more explicitly than the less proficient ones. This also suggests that "There is a regular process that operates similarly for native speakers of English and second language readers" (Block, 1992, p. 335). Finally, some implications that can be drawn from the study are that it is crucial to teach students to develop their own resources through awareness of the metacognitive process so that they can make use of these strategic resources when encountering reading problems.

A comparative study was conducted by Sheorey and Mokhtari (2001) to investigate if there are any significant differences in the metacognitive awareness of the reading strategies between ESL college students studying in the United States and those of native-English-speaking US students when reading academic materials.

The group of ESL students consists of 152 non-native-English-speaking international students, while there were 150 participants who were native-English-speaking American students. Data which were collected based on the Survey of Reading Strategies (SORS) were analysed in order to examine whether there were significant differences regarding the two main areas of reported strategy awareness and use between the two groups.

The findings reveal that the reported use of reading strategies in both groups is relatively high. However, the significant difference between the two groups is found in category of support reading strategies (SRS) which were reported from the ESL group. Some of the support strategies include using reference materials, taking notes, and underlining information in the text. Moreover, regardless of the students' reading ability, a similar order of importance is found to be cognitive, metacognitive, and support strategies when required to read academic texts although higher proficiency students in both groups are found to report more use of metacognitive and cognitive strategies than those who are in the lower proficiency level. The use of support strategies is employed by both groups to a different degree. The US high-reading ability students are in favour of using support strategies more than those in their low-reading ability. There is no such distinction among the ESL students as support strategies are used at all levels of their proficiency. Finally, regarding the difference in strategy use between genders, it is reported from the US group that a greater awareness of reading strategies is found among the females.



In conclusion, research in reading strategy use suggests that there is a strong relationship between the use of strategies and reading proficiency. Findings have shown that successful readers use strategies more frequently and efficiently than less successful readers and metacognitive awareness has an important role to play in enhancing reading proficiency in second language reading.

#### **2.3.4.2 Research on Reading Strategy Training**

An experimental study was carried out by Carrell et al. (1989) to investigate the effect of metacognitive strategy training focused on training in two reading strategies: semantic mapping (SM), and the experience-text-relationship (ETR) method. The study involved a group of 26 ESL students attending an intensive language programme at the Southern Illinois University and the training period lasted for four days. Two experimental groups received different types of training; one on semantic mapping training and the other one on ETR training, while the training of the other two control groups received was based on the language centre's syllabus. The students in the semantic group are asked to brainstorm and draw associations with the topic of the text before they start to read, whereas the lesson in the ETR group consists of the three following stages: activating prior knowledge, reading the text, and relating the text to the students' background knowledge. Research instruments used in the study included the use of tests and the Inventory of Learning Processes (ILP) to measure students' learning styles.

The findings show that the students in both the semantic mapping and ETR groups made a significant improvement regarding their scores on the test although there were some slight differences in a particular type of test. For example, the ETR group gains more significantly in the semantic map items than those who are in the semantic mapping group. However, when the results of the ILP are taken into account, it is found that there is a relationship between metacognitive strategy training and students' learning styles. When comparison is made among the three groups (SM, ETR, and control), there is a strong relationship between the deep-shallow scale of the ILP on the open-ended semantic map of the post-test scores, while both deep and shallow processors performed well within the two training groups.



It is concluded that there is a relationship between the training of the two reading strategies and the improved performance in students' reading proficiency and the inclusion of metacognitive strategy training is recommended especially among adult ESL students.

In the area of teaching vocabulary, a pilot study was conducted by Zimmerman (1997) to investigate the effect of vocabulary instruction in 35 U.S. postsecondary L2 students who were in the process of preparing for university entrance examinations. During the 10-week training, the students in the experimental group (n = 18) received interactive vocabulary instruction together with self-selected reading materials, whereas those L2 students in the other group (n = 17) only read self-selected materials.

According to Zimmerman (1997), each lesson included some of the following approaches: learning new words in meaningful contexts, drawing some relevance between instructed words and students' personal experience, and getting students involved in the learning process. At the end of the training, findings suggest that students in the first group made more progress regarding gains in vocabulary knowledge and their perceptions of vocabulary learning have improved. It has been suggested that reading teachers should pay more attention to vocabulary and give L2 students opportunities to use the new words they have learned. Moreover, contexts where new words are found and learned should be meaningful as well as interesting for the students. Students should also be encouraged more to choose their own materials to read. Finally, reading materials assigned for students to read should be well selected and chosen in response to their needs and interests.

With reference to the role of readers' metacognitive awareness of their reading processes and strategies in enhancing reading proficiency, Auerbach and Paxton (1997) took a step further to integrate research process into the ESL reading classroom involving three steps. First, the students were informed about the processes and results of previous studies. Second, some of the research instruments, e.g., think-aloud, observation, etc. as well as data analysis were introduced to the students. Third, the conduct of the current research was analysed and assessed by the researchers.



The research participants were ESL students who were attending an intensive language programme before entering university courses as first-year students. The countries they come from were China, Vietnam, Thailand, Ethiopia and many other countries in Latin America. The training was built on various concepts drawn from schema theory, strategies based on reading models (bottom-up, top-down, interactive), and the notion of metacognitive awareness.

The research tools used to collect information about their reading strategies included conceptions questionnaires, strategy awareness and comprehension assessment, reading interviews, reading inventories, and strategy questionnaires in L1 and L2. Auerbach and Paxton (1997) find the use of these tools useful in providing data on how the students feel when reading, the reading strategies they employ, and the type of reading model they adopt. Although the students' scores were not presented in the study, two striking features were that most of the students in the study can articulate the use of strategies while reading and their scores in reading comprehension show improvement. Moreover, the study does not make any claim about the success of the training against any particular set of strategies, but it is pointed out that, "It was a combination of factors cumulatively working together that contributed to students' sense of awareness, choice, and control" (Auerbach & Paxton, 1997, p. 257).

Reading comprehension in higher education has been regarded as one of the most crucial skills that ESL students need to acquire in order to succeed with their academic learning. A quasi-experimental study was conducted in South Africa by Dreyer and Nel (2003) to investigate the effect of the reading strategy instruction with undergraduate students. This is based on the belief that, "Instruction can be effective in providing students with a repertoire of strategies that promote comprehension monitoring and foster comprehension" (p. 350). The participants involved 131 first-year ESL students (a mixed group of speakers of Afrikaans and Setswana) attending the course in English for Professional Purpose course. The research tools used in the study included a reading strategies questionnaire, the TOEFL test and two in-house reading comprehension tests. Based on the reading comprehension scores drawn from both Communication studies and the TOEFL, they were assigned into two categories of "at risk" if their scores were below 55% and "successful" where they obtained above 55%.



The students in both experimental and control groups were asked to complete the questionnaire and test before and after the 13-week strategy instruction. The instruction in the experimental group was based on a technology-enhanced learning environment including features of printed interactive study guides, contact sessions with the lecturer and access to the information technology resources on Varsite, whereas similar training was not provided to the control group. At the end of the instruction, the results of the tests and questionnaires were compared and analysed.

The results reveal that the students in the experimental group differ statistically and significantly from those in the control group. The same can be said for the successful students who are found to significantly outperform those at-risk students in their reading proficiency. Finally, Dreyer and Nel (2003) encourage the need to identify problems students have with their learning while helping to equip them with strategic knowledge so that their learning can be facilitated.

Direct strategy training on reading strategies was also carried out with students at the University of Singapore by Varaprasad (2003). The study is based on the concept that by training students to become aware of patterns of information organised in paragraph levels, the students are helped to improve their understanding and retention of the information. Although thirteen first-year university students took part in the training course, data was based on two students who were chosen randomly.

At the end of the training, findings based on think-aloud reports reveal that students become more aware of generic patterns of information and are able to analyse its organised pattern in the text. However, they do not try to connect the writer's main ideas to form a general concept of what they read resulting in their failure to grasp the overall meaning of the text. As suggested by Varaprasad (2003), strategy training should be more holistically analytical with more emphasis on the top-down approach. Moreover, the conduct of strategy training should be focused more on the learner and be less teacher-fronted.

Research discussed in this section has yielded positive results on the facilitative effects of training in reading strategy training (i.e., Auerbach & Paxton, 1997; Carrell et al., 1989; Dreyer & Nel, 2003; Zimmerman, 1997). Think-aloud verbal reports which are one of the research tools used in these studies are discussed in the following section.



## 2.4 Framework of the Think-Aloud Verbal Report

It is not just since the 1980's that there has been an awareness of strategy research in this field. According to Urquhart & Weir (1998, p. 94), most studies in strategy research begin by having two groups of learners who have different reading abilities (i.e., good and poor) read a text either concurrently or retrospectively. Their reports are transcribed, analysed and grouped into classifications of reading strategies. This research methodology is also known as a think-aloud verbal report.

The think-aloud method was originally developed in the field of psychological research. In van Someren, Barnard, and Sandberg (1994), it has been stated that, "the verbal report method originally derived from the need to find a very direct method to gain insight in the knowledge and methods of human problem-solving" (p.1). One of the earliest studies was carried out by Newell & Simon in 1972. In their study, the participants were asked to think-aloud as they were working on problem-solving activities. The data gained from the study helps to support an information processing theory which is based on the strong ground that the human is a "processor of information" and that "thinking can be explained" (Newell & Simon, 1972, p.5). Verbal reports collected in this way have been used widely not only in cognitive but also in social science research since the 1970s (Ericsson & Simon, 1987). An example of earlier work in L2 reading includes Hosenfeld (1977).

Up to the present, verbal reports have played a significant role in numerous second language studies. The think-aloud method has been used as a means to investigate learners' cognitive processes in the use of languages as well as their learning strategies (Jourdenais, 2001; see also Cohen, 1998). Additionally, think-aloud can be used in wider contexts including the study of reading strategies which are a subset of learning strategies.

Think-aloud was used in this study as a means to gain information on the reading strategies the students employed while reading English texts. According to Olshavsky (1977), the general procedure as applied in reading research involves the following basic steps. First, readers are trained how to give verbal reports, then they are asked to think-aloud. Finally, their verbal reports are analysed for reading strategies employed while working on the material. A verbal report obtained from learners in this way is also known as a protocol analysis (Jourdenais, 2001).



### 2.4.1 Types of Verbal Reports

In this section, two well-established classifications of verbal reports proposed by Cohen (1998) and Jourdenais (2001) will be discussed. The original terminology as originated from the source will also be used for convenience in referencing. After that, similarities between the two classifications will then be highlighted.

Cohen (1984, 1987a, 1987b, 1998) summarises three basic categories of verbal report data as follows: self-report, self-observation, and self-revelation. Firstly, self-report is collected by asking learners to describe themselves in relation to what and how they do it when they learn a second language. Cavalcanti (1987) also refers to this particular type of verbal report as “self-perception” (p. 233). Questionnaires and self-report interviews are examples that fall within this category. Secondly, more specific language behaviour is inspected in self-observation, and data can be collected either introspectively or retrospectively. Finally, the last type of verbal report is self-revelation, which is also widely referred to as think-aloud. Cohen (1998) describes it as “stream-of-consciousness disclosure of thought processes while the information is being attended to” (p. 34). The data gained from think-aloud has the virtue of being unedited and unanalyzed. Jourdenais (2001, pp. 354-355) classifies three types of protocol reports as: introspective, retrospective, and think-aloud and their main characteristics are summarised in the table below.

**Table 2.2 Jourdenais’s Types of Protocol Reports**

	Concurrent with task	Subsequent to task	Ask learners to report processes
Retrospective		*	*
Introspective	*		*
Think-aloud	*		

As can be seen from the information presented in Table 2.2, both retrospective and introspective reports require learners to explain their processing strategies. The basic difference between the two depends on the timing of when protocol reports are collected from learners. Whereas introspective reports ask learners to verbalise simultaneously with the completion of the task, learners in the retrospection reports explain their thoughts after the completion of a task.



In the last category of think-alouds, learners are instructed to verbalise their thoughts concurrently while they are working on a task. No explanation of their thinking processes is needed once the task is done.

To summarise, there are some similarities that can be drawn between the two classifications proposed by Cohen and Jourdenais. The basic distinction between the different types of verbal reports relies on the matter of when these learners are asked to give their oral protocols, either retrospectively or concurrently. For example, if learners are asked to give their reports on completion of a task, it will be classified as ‘self-observational’ as proposed by Cohen (1998) or ‘retrospective’ as suggested in Jourdenais (2001). In the same way, the term ‘think-aloud’ is an umbrella term for concurrent verbal reports as well as what is described by Cohen as ‘self-revelational’. The timing of when data is collected determines not only which type of verbal reports researchers are going to use in the study, but also what type of verbal data they are going to obtain at the end of the data collection.

The distinction of time lapse is in line with Leow & Morgan-Short (2004 p. 36) who point out that verbal reports can be broadly categorized as “either introspective (concurrent or on-line) or retrospective (on-line or off-line)”. Ericsson and Simon (1993) are confident that both concurrent and retrospective verbal reports are effective research tools in providing data about learners’ knowledge and their past experience, which are not directly accessible through other traditional methods (i.e., tests, observations).

#### **2.4.2 Strengths and Limitations of Verbal Reports**

As pointed out earlier, there are no perfect tools to best capture learners’ cognitive processes, and think-alouds are no exception. Pressley and Afflerbach (1995) view this type of data collection method as, “controversial” (p. 16). In fact, both types of verbal reports have been reviewed by numerous researchers and writers in relation to their strengths and limitations.



### 2.4.2.1 Retrospective Reports

The major criticism of retrospective reports comes under the issue of memory constraints. Newell and Simon (1972) state that, “Retrospective accounts leave much more opportunity for the subject to mix current knowledge with past knowledge, making reliable inference from the data difficult” (p. 662). Nisbette and Wilson (1977) found that data gained from learners’ retrospective protocols did not represent their true processes engaged while performing the task as learners tried to hypothesize about what they did.

With reference to the Information Processing Model, Ericsson and Simon (1984, p.115) point out that the capacity of short-term memory (STM) is constrained by the limits of attention, while the storage capacity of long-term memory (LTM) is unlimited. Therefore, information held in STM can be retrieved directly, whereas in the case of LTM, the information needs to be accessed in order to be brought into attention. With respect to verbal protocols in general, it is assumed that only “information most recently attended to” or STM should be collected (Jourdenais, 2001, p. 355).

On the issue of time lapse, Cohen (1998, p. 35) expresses similar concerns to the degree that learners may try to make inferences of what “must have happened” by making use of their past experience or their own knowledge instead of giving accurate reports of what they actually did while completing a task. In the context of reading research, Olshavsky (1977) points out that the time delay may result in inconsistency in readers’ responses from one passage to another.

The use of prompts, e.g., questions, also has an effect on the way learners react to them. Van Someren et al. (1994, p. 21) point out that, “when asked for memories, explanations or motivations, people answer a question not from direct memory of the cognitive process but from an interpretation that can easily be influenced by expectations”.

To avoid having incomplete reporting as well as to enable learners to provide information from their STM as closely as possible, the two major concerns involve timing and phrasing prompts while data are being collect from learners (Ericsson & Simon, 1993, Greene & Higgins, 1994).



The suggested time lapse by Ericsson & Simon is within 0.5 to 10 seconds or recall of the information may be lost over longer durations. The types of questions should focus on ‘conscious, controlled cognitive processes’ to minimise learners’ chances of making inferences or interpreting their own thoughts (Kormos, 1998).

#### **2.4.2.2 Think-Aloud Reports**

As learners are simply asked to give verbal reports concurrently with a task without interpreting their thoughts, data gained in this way have been regarded favourably by researchers. This is because think-aloud protocols provide the information “most recently attended to” by learners (Jourdenais, 2001, p. 355). That is, the information still remains in STM when being reported (Kormos, 1998). Wallace (1998) considers data gained in this way as most immediate and has the potential of bringing to light the ongoing processes in a particular learning situation. Ericsson and Simon (1993) strongly support the collection of concurrent verbal reports or think-alouds as they believe that immediacy of the information reported is a crucial factor in making think-aloud distinctive from the other type of research tools.

In spite of the advantages mentioned above, think-aloud has also been criticised from several aspects. Some of the concerns raised by Seliger (1983) are in relation to the issue that learners’ cognitive processes are considered to be automatic and unconscious, so learners may not have full control over them. Jourdenais (2001) also questions the issue of whether learners’ thought processing is distorted through thinking aloud. The same issue has also received attention from Cohen (1998, p. 37) by referring to it as “intrusive effect”. The focal point of concern is the effect on the part of learners who are required to think-aloud while performing a task assigned. To think and do the task at the same time may change the way in which they approach the task.

Next, Wallace (1998) questions the use of verbal reports in relation to their validity in whether learners are reporting what they think they are supposed to, while Olson, Duffy and Mack (1984) take into account some other aspects that may have adverse effects on the results of think-aloud, which include the type of instructions provided, learners’ individual differences, the type of materials used and the data analysis.



Finally, there is the possibility of an overlap between the two types of verbal reports, think-aloud and retrospective. This is owing to the fact that if learners spend a longer time on describing their cognitive processes, their think-aloud verbal reports will turn into retrospective ones. In relation to this particular issue, Cohen (1998, p. 37) expresses concern that, “what may have begun as an introspective account quickly turns into a retrospective one.”

The limitations of think-aloud as a research tool are worth paying attention to before research is carried out, and there are some steps and precautions that researchers can take in advance to overcome or minimise the potential problems while increasing the degree of the data’s reliability and validity (Jourdenais, 2001; Cohen, 1998). In relation to data collection in reading research, Olshavsky (1977, p. 660) considers reading to be “a mental process”, and care has to be taken to ensure the research method chosen has as little effect as possible on readers.

With regard to the concept of automaticity as raised by Seliger (1983), Cohen (1987a) believes that strategies are conscious processes, so they can be identified by learners. Cohen reflects his view in stating that data gained from verbal reports are confined to a particular “subset of learning strategies that the learner is conscious of. In other words, we can only learn about the conscious strategies that learners utilize in their efforts to master a language” (p. 32).

In response to the concern over the possible effects of having learners do an on-line report while performing a task, Ericsson & Simon (1993) believe that there is no significant interference between talking and working on the task. In regard to psychological research, van Someren et al. (1994) point out that once people start talking out their thoughts while doing problem-solving activities, they have no difficulties in doing so after a few minutes.

Moreover, the involvement in what they are doing is so great that they have no time to interpret or reflect on what they are doing (Ericsson & Simon, 1993). One of latest studies in the field of reading research by Leow and Morgan-Short (2004, p. 48) concludes that “thinking aloud while performing a reading task does not seem to have detrimental effects on learners’ comprehension,”



Most of the concerns raised by Wallace (1988) and Olson et al. (1994) over the issue of validity can be avoided or minimised through well-planned elicitation procedures (Jourdenais, 2001; Cohen, 1998). The procedure suggested by Ericsson and Simon (1993, p. 376) includes giving general instructions which are then followed up by a few warm-up activities. Some of the activities suggested by McDonough and McDonough (1997) include “solving anagrams aloud, doing simple letter puzzles, and doing simple arithmetic aloud” (p. 196).

To respond to the last issue of the possibility of having the two types of verbal reports mixed up in the case of learners spending a longer time in verbalising their thoughts, Calvalcanti (1987) believes that the distinction between the introspective and retrospective reports are useful in relation to the type of data collection design, but they may not be very clear cut in practice and both types of verbal reports should be seen as a continuum. This view is supported by Ericson & Simon (1993).

In summary, the limitations in think-alouds do not necessarily bring out negative consequences, but rather provide a chance for researchers to take cautious steps before data collection is carried out. As stated by Jourdenais (2001, p. 374), “Through careful design of studies, elicitation of verbalizations, and coding of the data, a number of threats concerning the reliability and validity of verbal reports can be diminished”.

As a consequence, the use of think-aloud verbal report has been chosen as a means to investigate the use of reading strategies in the current study. To date, it has been considered to be the most effective way and direct way to have access into readers’ thoughts. Wallace (1998, p. 79) describes think-aloud verbal reports as “ways of making hidden processes more open to scrutiny”. As the study aims to investigate reading strategies, the verbal reports collected will help to reflect readers’ awareness and the engagement they have while working on the reading task assigned which will finally lead to an understanding of how their cognitive processing works.



### 2.4.3 Research on Think-Aloud Verbal Report

Think-alouds have been widely used in various areas of second language learning strategies. As suggested by Cohen & Hosenfeld (1981), some of these include multiple skills, oral communication, reading, writing (with a focus on grammar), and test-taking ability. Moreover, think-aloud has been used in the field of the learning and use of L2 vocabulary (i.e. Cohen & Apehek, 1981; Cooper, 1999).

Some of the studies which have been discussed earlier in Section 2.2.5 and Section 2.3.4 on related studies in learning strategies and reading strategies have also employed verbal reports as a research tool, some of which include Auerbach & Paxton, 1997; Block, 1986, 1992; Carrell, 1989; Hosenfeld, 1977; Naiman et al., 1978; O'Malley et al., 1985a; Vann & Abraham, 1990; Varaprasad, 2003; Wenden 1986b; and White, 1980, 1995. Generally, the researchers find data gained from verbal reports helpful as a research method to provide more information about learners' cognitive processing. Hosenfeld (1977) regards the information gained from verbal reports in the same way as what can be retrieved from a computer-printout.

Self-revelational data or think-aloud has been considered by Olshavsky (1977) as, "the best to determine strategy usage" (p. 662). It also has advantages over the traditional use of miscue analysis as think-aloud helps to reveal respondents' process of silent reading rather than simply focus on their oral reading behaviour.

In relation to the level of task difficulty, White (1980) suggests that a think-aloud task should be at the right level for learners to follow. He also emphasises that both researchers and learners should have clear concepts about their roles and what they are supposed to do before think-aloud is carried out.

In some of the learner strategy studies, self-report interviews as well as questionnaires are also employed (e.g., Naiman et al., 1978; O'Malley et al., 1985a). In these studies, the respondents are asked to answer oral interview questions about their learning experiences or answer questionnaires about their learning strategies. However, as the information provided by respondents does not come after cognitive events, questions have been raised regarding its validity. It is recommended that self-report should be decreased, while increasing the use of self-observational or self-revelational data (Cohen, 1998).



In order to examine L2 reading strategies, a more systematic way of think-aloud report was set up by Block (1986). In the study, Block marked a red dot at the end of each sentence in the reading materials for think-aloud so that respondents have to stop and reflect on their cognitive processes. The responses gained help to understand the reading processes employed by the participants in the study, based on which patterns of strategies are categorised and described.

Some of the participants in the study responded positively to the think-aloud activity, which they perceive to be a valuable experience in enabling them to reflect on their strengths and weaknesses as readers. Block also recommends the use of think-aloud in the classroom.

Anderson and Vandergrift (1996) propose a number of formats to be used in wider teaching applications while stating, "Using think-aloud protocols and other verbal report formats is a beneficial metacognitive activity and helps students become more aware of the options available to them in understanding language and being a better language learner" (p. 3).

Camps (2003) suggests the integration of both types of verbal reports, retrospective (self-observation) and concurrent (self-revelation) protocols in the same study to maximise the strengths each possesses. Camps points out that both types are beneficial in obtaining two different sources of information, and that comparison can be made through each type of verbal report data.

It can be said that verbal reports have been employed in a wide range of studies including reading research for several decades. According to Pressley and Afflerbach (1995, p. 38), think-alouds are considered to be "extremely revealing about the dynamics of comprehension difficulties and how understandings of text shift in reaction to comprehension difficulties and surprises in the text.", in addition, Kormos (1998) sees verbal reports as "highly useful tools" (p. 357) not just because of the uniqueness and richness of the data they yield, but also of the possibility of complementing it with some other kinds of data elicitation techniques.



## 2.5 Conclusion

As a reading strategy study, this chapter has provided an overview of key concepts in reading models which include bottom-up, top-down, and interactive models with the notion of schema theory discussed next. The discussion of these concepts helps to show development through time as well as how they have influenced teaching approaches especially in the area of second language reading.

As research suggests that successful learners use a variety of strategies to help them with learning and these strategies can be taught to less successful learners, the notions of language learning strategies as well as strategy training have then been discussed. The framework this study follows is proposed by O'Malley and Chamot (1990) in that the term strategies is defined as, "the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (p. 1).

Under the cognitive approach, language learning is viewed as a complex cognitive skill concerning the theory of information processing. Within this respect, learning strategies that derive from cognitive processes have an effect on learning outcomes in a positive way. The proposed categories of metacognitive, cognitive, and social/affective strategies have also been discussed in full detail in Section 2.2.3.2.2.

However, as pointed out by Singhal (2001), "Such strategies will vary depending on the language area or skill to be mastered." Research carried out in the context of reading helps to shed some light on how learners make use of reading strategies to help them improve their understanding of the text. The definition of reading strategies as applied in this study refers to "all actions taken by readers to maximise their reading potential." Frameworks as well as studies conducted in reading strategies and reading instruction have then been discussed.



## **Chapter 3**

### **Research Methodology**

This study aims to explore the effects reading strategy training has on improving students' reading comprehension. The main study is carried out to fulfill three main objectives. First, it investigates the reading strategies the students in the study use when reading. Secondly, it investigates the effect of reading strategy instruction on the students' reading performance. Finally, the study compares the types and frequencies of reading strategies used over time by the students in the study. To recap, the current study proposes to answer the following research questions:

1. What are the reading strategies the students in the experimental and the control groups use when reading English texts?
2. Is there any relationship between the students' level of reading proficiency and the types and frequencies of reading strategies reported?
3. What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?
4. Does strategy training help the students in the experimental group to improve their reading proficiency significantly?
5. Do the students in the control group benefit from the usual approach to teaching reading in improving their reading proficiency?
6. To what extent do the students at different levels in both groups benefit from the two different teaching approaches?

This chapter examines the research methodology and the research tools used in the main study. It begins first with issues within the research design, its procedure and the population involved in the study. Next, it examines a number of research tools used in the main study in relation to their advantages, disadvantages, and their use in pilot studies. The research tools to be examined include reading strategy questionnaires, think-aloud verbal reports, reading logs, and reading comprehension tests. This is followed by a detailed examination of procedure of reading strategy training which forms an integral framework during the instructional period. It, then, presents how the data are analysed together with the particular statistical techniques used. Finally, a flow chart of the methodology is presented to give an overview of the research process.



### **3.1 Research Methodology**

Generally, the two paradigms of quantitative and qualitative research are often seen as mutually “incompatible” (Brannen, 2005, p. 173). According to Larsen-Freeman and Long (1991), the prototype of quantitative methodology includes hypotheses-testing, objective research tools, and the analysis of statistics. On the other hand, qualitative data rely more on observation with no emphasis on statistical analyses.

In relation to social research and SLA studies, many writers (i.e., Brannen, 2005; Larsen-Freeman & Long, 1991; McDonough & McDonough, 1997) have proposed that there is more to gain from combining attributes of both paradigms as they can be complimentary to each other. This is sometimes referred to as mixing methods (Brannen, 2005; McDonough & McDonough, 1997).

To have a better understanding of L1 and L2 reading processes, Connor (1987) further states that multiple methods have been used in various studies although the type of design chosen depends largely on the researchers’ academic background, e.g., psychology, linguistics, sociolinguistics. According to Connor, “the multimodality of reading research is an asset which provides researchers multiple methods to investigate their research problems” (p. 11).

Brannen (2005) expresses the view that a multi-method strategy can be utilised at any phase of the research process including research design, data collection or data analysis. According to Brannen, multi-method research does not mean it will be “better research” (p. 183); it rather provides researchers with tools to address research questions, analyse and interpret data more effectively and precisely according to the assumptions originally generated.

#### **3.1.1 The Research Design**

The nature of the current research is of an experimental design combining features of both quantitative and qualitative paradigms. The major instruments and materials used in this current study include reading strategy questionnaires, think-aloud verbal reports, reading logs, reading comprehension tests and two different approaches within reading lessons, namely, strategy-based and task-based.



Experimental research has been firmly established in social sciences based on which cause-and-effect relationship can be demonstrated with a high degree of confidence (Bryman, 2001; Connor, 1987; McDonough & McDonough, 1997; Neuman, 2003). In the realm of reading strategy training, some experimental studies include Carrell (1985) and Raymond (1993).

Neuman (2003) defines the term ‘experiment’ as “modifying something in a situation, then comparing an outcome to what existed without modification (p. 238). To clarify, what is modified is also referred to as the treatment or the independent variable, while the outcomes or dependent variables refer to some kind of change which occurred at the end of the treatment which could be in the form of behaviours, physical conditions or attitudes (Neuman, 2003).

Larsen-Freeman and Long (1991) state two criteria which an experiment is required to satisfy which are firstly, experimental and control groups need to be set up and secondly, subjects must be randomly assigned into these groups. Random assignment is a crucial method to ensure that assigned cases, e.g., individuals, organisations, etc., are basically alike (Neuman, 2003) so that any differences post-treatment can be claimed as a consequence from the treatment itself (Larsen-Freeman & Long, 1991). McDonough and McDonough (1997) note that random assignment of subjects in an educational setting tends to be the most problematic in setting up.

### **3.1.2 The Research Procedure**

There are a number of steps involved in setting up an experiment which are as follows:

- |         |   |
|---------|---|
| Stage 1 | An analysis of the theory related to the research.                                |
| Stage 2 | Formulation of a hypothesis and setting an appropriate level at which to test it. |
| Stage 3 | Taking account of the population and drawing a sample from it.                    |
| Stage 4 | Piloting your experimental procedures.  |
| Stage 5 | Assigning subjects to experimental or control groups.                             |
| Stage 6 | Carrying out the treatment on the experimental group.                             |
| Stage 7 | Comparing the experimental and control groups.                                    |

(Opie, 2004, pp. 88-89)



To sum up, the basic steps involve deciding on a topic to work on, and after that it needs to be narrowed down so that its hypothesis can be formulated and tested. Next, subjects are randomly assigned to a particular group. It is important that the subjects in both groups have the dependent variable measured in a pretest and once again in a posttest. Finally, the results from both groups are examined to see if the proposed hypothesis receives support.

In order to fulfill the specific aim and explore answers to the research questions posed at the beginning of this chapter, the three main phases of the current research process are discussed next. The first stage begins after the subjects are randomly assigned into experimental and control groups. According to Neuman (2003), it is this stage that marks the beginning of the experiment.

**Phase 1:** Before the course of study, two groups were chosen to take part in the experiment and assigned into experimental and control groups randomly ( $n = 30$  in each group). Next, they were asked to: firstly, take a reading comprehension test to measure their reading proficiency; secondly, answer a strategy questionnaire to find out about their reading strategies used and finally, take part in a think-aloud report to examine their reading strategies in real use by a random sampling ( $n = 4$  from each group).

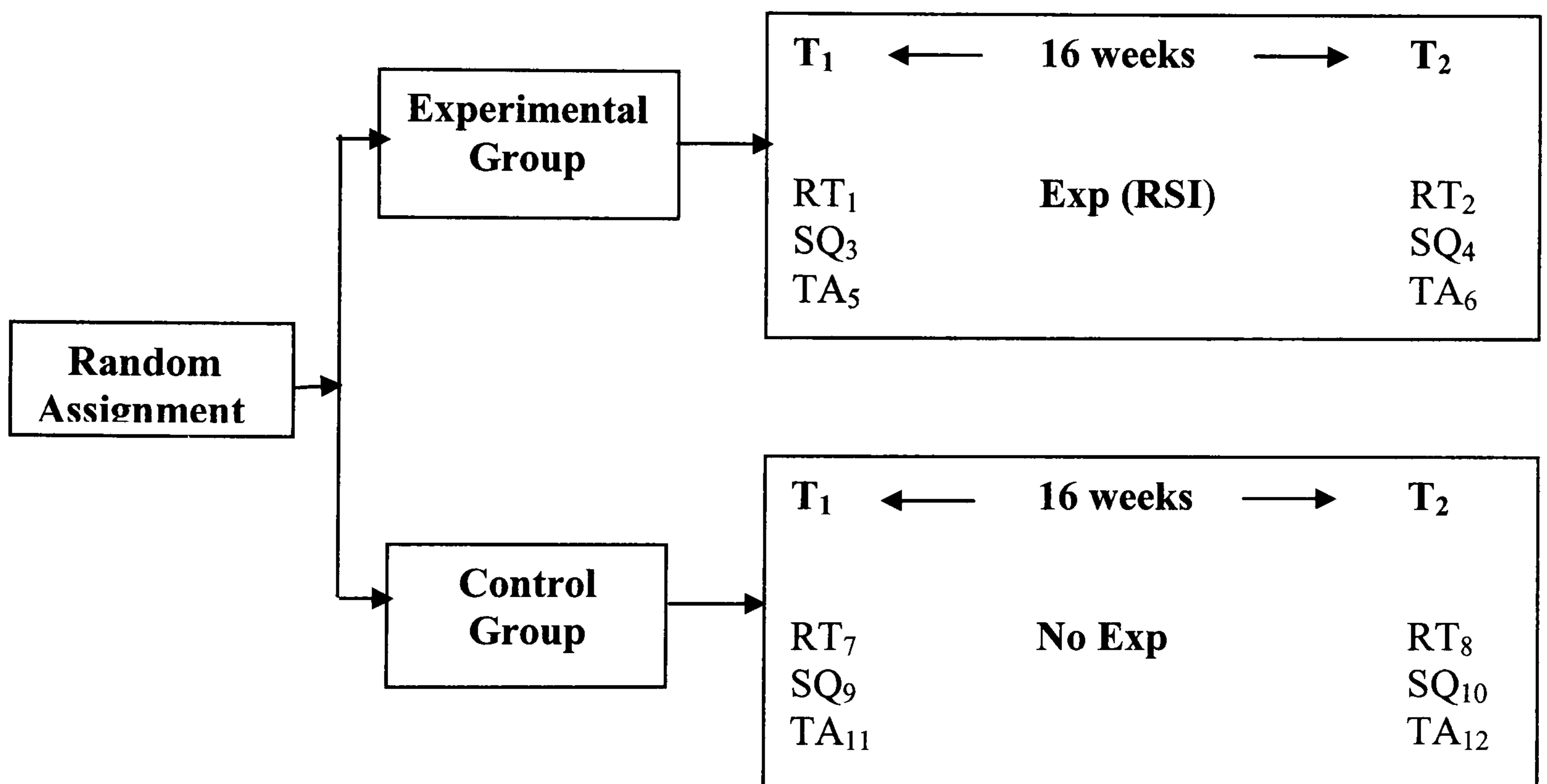
**Phase 2:** As this study was undertaken to investigate if a particular way of delivering reading instruction, referred to in this study as “reading strategy training”, helps improve the students’ reading comprehension proficiency, two different ways of delivering reading lessons were applied during the course of study. The concept of reading strategies was integrated and practised in the experimental group, whereas the control group did not receive instruction on reading strategies. However, both groups were also asked to keep a log book recording their reading activities throughout the term. The experimental period lasted for 16 weeks.



**Phase 3:** At the end of the term, the students from both groups repeated the same procedures in: firstly, taking the test administered previously; secondly, completing the same reading strategy questionnaire and thirdly, taking part in another think-aloud verbal report. The results from pretest and posttest as well as pre- and post-reading strategy questionnaire were compared and analysed statistically. Both pre- and post- think-aloud reports were also transcribed and analysed in relation to the types and frequencies of reading strategies used over time.

The above stages can be summed up and presented in a diagram format as follows:

**Figure 3.1 Experimental Procedure of the Current Study**



(Adapted from Bryman, 2001, p. 34)

Full notations of abbreviations are as follows:

- T the timing of the experiment period; T<sub>1</sub> = before the treatment, whereas T<sub>2</sub> = after the treatment
- Exp the experiment treatment, whereas No Exp = the absence of an experimental treatment
- RSI reading strategy training
- RT reading test
- SQ strategy questionnaire
- TA think-aloud verbal report



### **3.1.3 The Research Context**

As mentioned earlier English has a vital role to play in the Thai education system. At tertiary level, the English Foundation Course is one of the requirements for most undergraduates to enrol to in their first year.

At Thammasat University, the course is offered at three different levels: lower, pre-intermediate and intermediate. The formal course titles are Remedial English Foundation Course (EL 070), English Foundation Course I (EL 171) and English Foundation Course II (EL 172) respectively. These courses consist of studying integrated language skills which aim to improve the students' English proficiency in general.

However, the number of English Foundation Courses each student is required to take depends largely on their English Entrance Examination (EEE) scores. For example, students with low scores will be placed in the Remedial Course and work their way up through the English Foundation Courses I and II while some might be required to only enrol in the English Foundation Course II.

Under normal circumstances, there are approximately 80 to 100 classes (sections) in each term. The number of students in each class varies from 30 to 35 per instructor. In-house text books for EL 070, EL171, and EL 172 form the basis of the course at each level for the instructors to follow throughout the whole course. All text books consist of 8 units and have a similar format in presenting their unit content. Each unit comes with a main reading text and leads onto to the other language skills of listening, writing and speaking.

The current study was carried out in the second academic term during the period, November 2004 – February 2005. It took place in a classroom setting at Rangsit Campus, Thammasat University in Pathumthani Province where all first-year classes are held. Details of the participants are discussed in the next section.

### **3.1.4 The Participants**

For the main study, the researcher was randomly assigned two classes to teach by the Foundation Course coordinator. They were currently enrolled in the English Foundation Course II (EL 172) at Rangsit Campus, Thammasat University.



The experimental and control groups were assigned randomly before the course started. This was done by writing the groups' reference section numbers in one box and the two labels, 'experimental' and 'control' in the other box. The researcher then took one group section from one box and one label from the other to match. After the group section and the category were matched, the experimental and control groups were established.

Both classes had already taken English Foundation Course I in their previous term (June-September, 2004) and were taking English Foundation Course II in their second term (November 2004 – February 2005) as their final compulsory English course. Their English proficiency is at intermediate level.

All of the subjects are of Thai nationality. Their age ranges from 18 to 19 years old. There were 30 students in each class with 26 females and 4 males in each. They have come from different disciplines in both applied science and social science. The number of years they have spent studying English is between 8 and 16 years. Details about the students in both groups are summarised in the following tables:

**Table 3.1 Details of the Students in the Experimental Group**

<b>Faculty</b>	<b>Female</b>	<b>Male</b>	<b>Total</b>
1. Accounting	11	1	12
2. Science & Technology	14	3	17
3. Engineering	1	-	1
<b>Total</b>	<b>26</b>	<b>4</b>	<b>30</b>

**Table 3.2 Details of the Students in the Control Group**

<b>Faculty</b>	<b>Female</b>	<b>Male</b>	<b>Total</b>
1. Law	3	-	3
2. Political Science	6	1	7
3. Mass Communications	4	-	4
4. Anthropology	2	1	3
5. Science & Technology	4	2	6
6. Allied Health	7	-	7
<b>Total</b>	<b>26</b>	<b>4</b>	<b>30</b>



### **3.1.5 Main Concerns over an Experimental Study**

In designing and carrying out good research, there are a number of features to be satisfied. As proposed by McDonough and McDonough (1997), some of which include: utility, reliability, objectivity, originality, validity, ethics, etc.

In relation to social research, two key features as proposed by Neuman (2003) are reliability and validity. They are “central issues in all measurement” (p. 179). They are what social researchers should aim for in order to increase the level of truthfulness and the credibility of the findings. The issue of ethical implications in experimental research is also crucial as it also counts as another dimension of the validity of a study (Bryman, 2001).

Therefore, some of the key features that will be discussed in this section include the three characteristics of reliability, validity and ethics. Although as suggested by McDonough and McDonough (1997) these features are not independent but interact. Each of the features will be discussed in turn as follows.

#### **3.1.5.1 Reliability**

Reliability is defined by Neuman (2003, p. 178) as, “dependability and consistency”. This suggests that a similar research context and situation will yield the same results. In other words, a piece of research with a high level of reliability can be replicated producing the same results. McDonough and McDonough (1997) see this as an opportunity to have research reliability tested by other researchers. In order to make it easier to replicate, Bryman (2001) suggests that all research measures and procedures employed in a study should be made as clear as possible for other researchers.

In relation to the current study, care has been taken within this chapter to ensure that all details related to the construction, the implementation, the procedures as well as statistical figures of all research tools are as complete as possible. The analysis of quantitative and qualitative findings are also presented and discussed in Chapters 4 and 5 respectively.



### **3.1.5.2 Validity**

Research can be said to be valid if the way a researcher conceptualises the idea and measures are matched. According to Neuman (2003, p. 179), validity suggests the quality of “truthfulness”. In experimental research, distinction is made between internal and external validity.

#### **3.1.5.2.1 Internal Validity**

Internal validity which is defined by Neuman (2003, p. 260) as “the internal logical rigor of an experiment” is an essential element which experimental research needs to have. In order for a true experiment to achieve its internal validity, there is a strong need to eliminate all rival factors that may have an effect on causal findings (Bryman, 2001). This is because these alternative explanations may affect the dependent variable and weaken the cause-and-effect relationship of experimental research. These unwanted factors are considered as threats to internal validity.

As proposed by Neuman (2003, pp. 251-255), there are at least 10 common threats to internal validity; some of which are selection bias, history, maturation and testing effect. These issues should be taken into consideration before and while the study takes place. Attempts to show how these factors can be handled and minimised are discussed next.

As mentioned earlier, the study is carried out to investigate the relationship between the treatment which is reading strategy instruction and the extent to which it affects students’ scores in their reading test at the end of the experiment. Therefore, care has been taken to minimise all other possible factors that may have affected the internal validity of the research. For example, the issue of selection bias was controlled as the students in the main study were selected and assigned into experimental and control groups at random. Both groups were in their original grouping based on the entrance exam scores. The pretest was carried out to measure if they were different in terms of their reading scores. The average scores between the two groups are not statistically significant (Experimental = 13.57, Control = 14.30). Moreover, there were equal numbers of 30 students in each group with the same number of males and females. This is in line with what is suggested by Pallant (2001) that equal numbers of subjects in each group should be maintained.



Next, the students in both groups were less likely to have testing effect regarding the fact that they had to do the same test twice. This is because as a 16-week course, it leaves a substantial time gap in between so that the students could not recall the answers they made on the pretest. Moreover, the questions in the test are not based on facts in which the students can go look for correct answers from reference books, but require them to find the answer from the text by reading. Lastly, the correct answers were not made known to the students, so it is impossible for them to learn from their pretest.

Based on the discussion so far, it can be seen that major threats that are likely to counter the internal validity of the current study were fully under control. This has resulted in increasing the study's internal validity.

#### **3.1.5.2.2 External validity**

In experimental research, external validity is highly valued as it enables researchers to generalise their findings in wider contexts and applications (Neuman, 2003). According to McDonough and McDonough (1997), the quality of generalisability is considered as “a prized attribute of good experimentation” (p. 165). Neuman (2003) suggests that there are two types of threats in experimental research. One deals with realism and the other one concerns reactivity. Each of these elements is discussed next in relation to the main study.

Regarding the issue of realism, the two main concerns include the questions of whether experiments are realistic and whether generalisations from findings can be applied to the real teaching situation. It can be said that the experiment in the current study is realistic as it took place in a natural classroom setting. Both groups were also taught by the researcher who is one of the teaching staff in the university for the whole term. Moreover, the treatment to be carried out resembles real and common practice in language teaching. Finally, in view of the fact that all of the participants are Thai undergraduates attending the English Foundation Course makes it possible to generalise the findings and draw inferences to where similar contexts are established.



Finally, the last issue left to be discussed is reactivity which is also referred to as the Hawthorne effect. This issue has derived from the fact that the participants are fully aware that they are in experimental research, so they might react differently from the way would normally do in real life (Neuman, 2003). In order to avoid this effect, the students in both groups were informed that they were part of a study on the teaching of reading in a classroom setting and that all lessons would go along as normal. However, they were required to take a test and complete a questionnaire at the beginning and at the end of the term. They were ensured that their scores in pretest and posttest would not be counted against them as assessment. Their performance would be judged as prescribed in the course syllabus just like their fellow students in the other groups. Apart from this, some students would be randomly asked to take part in think-aloud sessions. By giving the students full explanations, this helps them to be well informed of what is required of them and lessen their anxiety.

### **3.1.5.3 Ethical Considerations**

Ethical considerations are a significant issue in experimental research because the nature of an experiment can be intrusive or manipulate research participants' feelings or behaviours. Therefore, researchers should be careful not to mislead participants, and ethical standards should be observed (Neuman, 2003).

The experiment began after the permission from the director of the Language Institute was granted. Based from the fact that the study was carried out in a real teaching context, extra care was given to ensure that the different methods of teaching reading would not put any member of the groups at a disadvantage. While the outline of reading instruction in the experimental group is based on the framework proposed by O'Malley and Chamot (1990), the teaching method in the control group is drawn from the methods of other lecturers teaching the same course. Details of the two methods will be discussed next in Section 3.2.5.

Moreover, all of the students were well informed about the purpose of the study and permission was obtained from individual students by asking them to sign the consent form (See Appendix A). Although there is a low risk involved in taking part in this experiment, all students are addressed anonymously when reference is made to them through the use of coding system in this study.



### 3.2 The Research Tools and Materials Used

The main purpose of data collection in learning strategies is to find out about learners' use of strategies when actually working on certain tasks in different contexts (O'Malley & Chamot, 1990). In order to do so, researchers are faced with a challenge because learning strategies are "generally internal or mentalistic processes" which in most cases cannot be observed unless a multiplicity of assessment methods are used (Cohen, 1998).

Basically, some of the assessment methods as proposed by Cohen (1998); McDonough (1995); McDonough & McDonough (1997) and Oxford (1990) share some similar features of interviews, questionnaires, observations, verbal reports, diaries or journals. McDonough (1995, p. 9) classified the use of questionnaires as "soft evidence" or "indirect method", while think-aloud reports and diaries belong to "hard evidence" or "direct methods". Although all these methods are useful tools, some selection needs to be made to comply with the particular aims or objectives of a study (Oxford, 1990).

As this study aims to explore the reading strategies which are considered to be of internal processes and are not available for observation, the research tools chosen have to account for combining multiple techniques. The research tools selected include a strategy reading questionnaire, a think-aloud verbal report, and a reading log which reflects a form of diary writing.

Owing to the fact that it is an experimental study, there is a need for the other two research tools which are a reading proficiency test and an 8-period outline of reading strategy instruction. While the test is used to measure the students' reading proficiency before and after the treatment, the outline of reading instruction training introduces the treatment to the experimental group.

The constructions of each research tool as well as the pilot studies are discussed in the following order: the reading strategy questionnaire, the think-aloud verbal report, the reading log, the reading comprehension test, and two approaches to reading lesson plans, text-based and strategy-based.



### 3.2.1 Reading Strategy Questionnaire

Questionnaires are one of the research tools commonly used in educational and ELT contexts to gain data from learners (McDonough & McDonough, 1997). Generally, questionnaires usually require learners to answer questions which consist of scaled questions, closed or open-ended questions. Wallace (1998) points out that the questions asked should be relevant to the purpose of the study, but at the same time respondents should feel at ease when answering them. In other words, they should not be too intrusive. It is also suggested that questionnaires should possess the characteristics of being clear and simple so that respondents have no difficulties in understanding the instructions or answering questions (McDonough & McDonough, 1997).

#### 3.2.1.1 Strengths and Weaknesses

Like all other research tools, questionnaires have both advantages and disadvantages in their use. According to McDonough & McDonough (1977), questionnaires can be used in small to large scale research. Not only can they be used at different times but also be distributed at different locations. Finally, it is also an economical way to save money and time (Wallace, 1998). However, McDonough (1995) points out the fact that although questionnaires help to reflect learners' view of "what they believe they will do, or have done, they cannot tell us what they actually do" (p. 10).

Questionnaires are usually used in connection with survey work. Further distinction is made between "more-structured" and "less-structured" surveys (Oxford, 1990, p. 199). In relation to the first type of more-structured questionnaires, researchers have more control of the questions resulting in having well organised data that can be objectively scored and lend itself to statistical analysis (Oxford, 1990; McDonough, 1995; Wallace, 1998). On the other hand, researchers might find data gained from less-structured questionnaires lack organisation and it may be difficult to generalise among learners (Oxford, 1990).

One example of the use of highly-structured questionnaire to find out about learning strategies includes Oxford's Strategy Inventory for Language Learning (SILL). Some other studies that use questionnaires to find out about learners' use of strategies include Carrell (1989); Oxford & Burry-Stock (1995); Padron & Waxman (1988); Purpura (1997); Phatiki (2003) and Wimolkasem (2001).



### 3.2.1.2 The Format of Questionnaire

The purpose of the questionnaire is to investigate the reading strategies the students use when reading English texts. The questionnaire combines closed and open sections to maximise different types of data gained from the students. The questionnaire is divided into the following three parts:

Part I:	General Information	6	items
Part II:	Reading Strategy Statement	45	items
Part III:	Open-ended Questions	7	items

The first part of the questionnaire requires the students to provide personal information about gender, faculty and the number of years studying English, while the second part is presented in a statement format with a degree of agreement marked known as the Likert ranking scale. The last part of the questionnaire consists of 7 open-ended questions focused on the subjects' perception of their own reading abilities, particular skills they need improving as well as the reading strategies they use (if any).

After the final draft, the researcher follows the suggestions given by O'Malley & Chamot, 1990; McDonough & McDonough, 1997; Wallace, 1998, in translating the questionnaire into the students' mother tongue, which in this case is Thai. According to Wallace (1998), the use of the students' native language helps to acquire valid data from learners. Providing two versions of the questionnaire for the students to choose from gives the students an option to work on the version they feel more comfortable with and avoids misunderstandings due to the language barrier. This will finally lead to improving the reliability rate of the questionnaire.

After being translated, both versions of the questionnaires were read by two experts who have sound knowledge of both languages and comments were provided on the issues of clarity and correctness between the two. Changes were then made accordingly. In the pilot study, both versions in Thai and English were provided, and the students were instructed to work with the version they were most comfortable with.



### 3.2.1.3 The Framework of Questionnaire

As mentioned earlier, reading strategies are a subset of language learning skills, the framework of the reading strategy questionnaire is based on the three categories of learning strategy as proposed by O'Malley and Chamot (1990). However, attempts are made to maintain the key concepts presented in the original form, but adapt them more towards reading strategies. In relation to this research, reading strategies are defined as "all actions taken by readers to maximise their reading potential". Details of the modified definitions of the three learning strategies in the reading context are as follows:

- **Metacognitive strategies** are attempts or initiations readers consciously take to facilitate their reading process. They include making a plan, monitoring and checking their understanding.
- **Cognitive strategies** are steps readers take while engaging in the reading process to maximise their comprehension by making use of their available resources, previous knowledge or experience.
- **Social/affective strategies** are methods readers use when having reading problems. These can be utilised through interaction or cooperation with others.

There are 21 statements covering 5 sub-categories of metacognitive strategies. Details and examples of statements are presented in the following table.

**Table 3.3 Questionnaire Statements under Metacognitive Strategies**

<b>Subcategory</b>	<b>Definition</b>	<b>No. of statements</b>	<b>Example of statement as appeared in the questionnaire</b>
1. Advance organization	The readers browse through the text by skimming for the main ideas or scanning sections and headings.	5	31. I guess what a passage is about from its title.
2. Advance preparation	The readers make a plan of how they are going to read the text.	2	2. I try to think about the related vocabulary I know before I start to read.



3. Selective attention	The readers pay attention to key words, phrases, linguistic markers, sentences, or types of information.	4	38. I look for key words in a passage which signal what it is about.
4. Self-monitoring	The readers consciously and regularly check their comprehension while reading (and employ fix-up strategies when it is not).	6	17. If I don't comprehend what I am reading, I try to identify what the problems are about.
5. Self-evaluation	The readers try to evaluate how successful they are in understanding what they have read.	4	22. After reading, I check if my prior guess about the title is correct.
<b>Total</b>		<b>21</b>	

There are 18 statements covering 10 sub-categories of cognitive strategies. Details and examples of statements are presented in the following table.

**Table 3.4 Questionnaire Statements under Cognitive Strategies**

<b>Subcategory</b>	<b>Definition</b>	<b>No. of statements</b>	<b>Example of statement as appeared in the questionnaire</b>
1. Resourcing	The readers use other reference materials to help them understand the text better.	1	3. I look up the words I don't know in a dictionary.
2. Grouping	The readers take note of how the related items are grouped together.	1	43. While reading, I try to understand how the things are grouped together.
3. Note taking	The readers write down important pieces of information while reading.	2	12. I draw numbers or diagrams to represent the key concepts of what I am reading.



4. Summarising	The readers make a summary of what being read.	1	25. I write a summary of what I have read.
5. Deduction	The readers use grammatical rules they know to assist comprehension while reading.	1	30. I make use of my grammatical knowledge of English to analyse difficult sentences.
6. Imagery	The readers make use of visual images to better their comprehension of the text.	2	35. I use my imagination to help me understand the situation in the texts.
7. Auditory representation	The readers vocalise while reading to help with their understanding of the text.	2	39. I relate the sound of some new words to the Thai words I know so that I can recall them later.
8. Elaboration	The readers make use of their academic as well as world knowledge to help them understand the content of the text.	2	8. I make use of my experience to help me understand what I am reading.
9. Transfer	The readers try to make a connection between the meaning and sound of a word to help remember and recall.	2	44. I translate what I am reading into Thai.



10. Inferencing	The readers make inferences by guessing or drawing logical inferences from the text while reading.	4	18. I guess word meanings by using contexts.
<b>Total</b>		<b>18</b>	

There are 6 statements covering 3 sub-categories of social/affective strategies. Details and examples of statements are presented in the following table.

**Table 3.5 Questionnaire Statements under Social/Affective Strategies**

<b>Subcategory</b>	<b>Definition</b>	<b>No. of statements</b>	<b>Example of statement as appeared in the questionnaire</b>
1. Questioning for clarification	The readers seek further explanations from a teacher or peers.	2	13. I ask my friends for help with the vocabulary or translation of the reading texts I don't understand.
2. Cooperation	The readers work with others to build up their comprehension of the text.	1	23. I find it is helpful to read and exchange different pieces of information in a group within the classroom.
3. Self-talk	The readers motivate themselves to read.	3	40. I tell myself if I try harder, I can become a more successful reader.
<b>Total</b>		<b>6</b>	

The numbers related to each strategy are as follows:

Metacognitive strategies	=	21	statements
Cognitive strategies	=	18	statements
Social/affective strategies	=	<u>6</u>	statements
<b>TOTAL:</b>	=	<b><u>45</u></b>	<b>statements</b>



### 3.2.1.4 The Pilot Study

Piloting a questionnaire before trying it out is highly recommended by Pallant (2001) and Wallace (1998) so that problems which arise can be dealt with before it is used in the main study. The first draft was completed in April 2004. The questionnaire was tried out at 2 different stages: pre-pilot and pilot.

The first draft of the questionnaire was pre-piloted with 8 students studying at the University of Wales, Bangor. Among these eight subjects, two of whom are British native-speakers, the other two from the Philippines and the rest were four students from Thailand, Korea, the Netherlands and Spain. The subjects were all helpful in providing some useful comments on several aspects of the statements in the questionnaire. Some changes to improve the clarity of the statements were then made accordingly.

The pilot study was carried out in September 2004 and there were 58 students who completed the questionnaire. This group of students represented the corresponding students in the main study in terms of their level of English and the course they were taking.

After they completed the reading comprehension test, both versions of the questionnaires in English and Thai were given out by having been photocopied back to back. The students were informed that they can choose to work on either version and that if there were unclear statements, they should make a note of them. The time allocation of 30 minutes worked out well.

At the end of the pilot, it was obvious that the students preferred to work on the Thai version as there was only one student who worked on the English version, so the Thai version was selected for the main study. As the students in the pilot study did not express difficulties understanding the instructions or the statements, no change needed to be made. The English questionnaire can be found in Appendix B.1, while the translated version is in Appendix B.2.



### **3.2.1.5 The Statistical Results**

After the end of the pilot, the 45 items on the questionnaire were analysed using the SPSS Program, version 12 for their reliability coefficients. Although the level of reliability can vary according to the nature and purpose of the scale, Pallant (2001) states that a minimum of .7 is recommended.

According to the current study, the piloted questionnaire has high internal consistency, with a Cronbach's alpha coefficient reported of .7673 with the standardised item alpha of .7747. In this case, the Alpha value is .77 which is above .7, so the scale is considered to be reliable. Details of the reliability analysis can be found in Appendix C.1.

## **3.2.2 The Think-Aloud Verbal Report**

The think-aloud verbal report is the second research tool used in the study. Details of the think-aloud verbal report, types of verbal reports, their strengths as well as their limitations, and related studies have been discussed in Chapter 2. In this section, the discussion is based on reporting the think-aloud pilot study in detail.

### **3.2.2.1 The Think-Aloud Pilot Study**

As the researcher had not used the think-aloud technique before, the piloted think-aloud sessions were found to be helpful in a number of ways. Firstly, they helped the researcher to familiarise herself with the procedure involved. Secondly, the researcher could foresee some of the potential problems that could affect the reliability and the validity of the study so that they can be avoided or minimised in the main study. Finally, the researcher could make use of the data gained from the think-aloud pilot as guidelines in how data should be analyzed and categories of reading strategies be set up.

#### **3.2.2.1.1 Participant Information**

The pilot study was carried out in Thailand in September 2004. Based on the results of the piloted reading comprehension test, four first-year students who were enrolled in English Foundation Course II (EL 172) were selected to take part in the think-aloud pilot. Two of the four students received high scores (one male and one female) and the other two with low scores (one male and one female).



Their age range was between 17 and 18. Details of the students who participated in the think-aloud pilot are as follows:

**Table 3.6 Information of the Students in the Think-Aloud Pilot**

Sex	No of Student		Total
	With high score	With low score	
Male	1	1	2
Female	1	1	2
<b>Total</b>	<b>2</b>	<b>2</b>	<b>4</b>

### 3.2.2.1.2 Text Selection

There were three reading texts to be tried out in the think-aloud pilot. Their titles were, 'Global warming is real and underway' 'Did you know we live in a GREENHOUSE?'(sic.), and 'Bali Travel Information'. As only two texts were required to be used in the main study for pre- and post instructional periods, based on the result of the think-aloud pilot, one of the three texts that was found too difficult to read by the students would be discarded.

Drawn from the suggestions made by Cohen (1998) in relation to characteristics of the materials and the description of properties of reading texts suggested by Carrell (1991), details of the three texts can be summed up as follows:

**Table 3.7 Information of the Piloted Reading Texts**

	Text 1	Text 2	Text 3
<b>Title</b>	Global Warming is Real and Underway	Did you Know We Live in a Greenhouse?	Bali Travel Information
<b>Topic</b>	Global warming	Greenhouse effect	Travel
<b>No. of words</b>	313	489	414
<b>No. of sentence</b>	20	37	27
<b>Genre of the text</b>	Article	Article	Documentary
<b>Content of the text</b>	Provides evidence to support the view that global warming has caused drastic changes to the environment and suggest action to be taken.	Discuss the cause and the consequences of the greenhouse effect and suggest solutions to the problem.	Provide travel information (e.g., geography, local transport) about Bali which is an island in Indonesia.



<b>Source of the text</b>	<a href="http://www.ucsusa.org/global_environment/global_warming/index.cfm?pageID=27">http://www.ucsusa.org/global_environment/global_warming/index.cfm?pageID=27</a>	<a href="http://www.ns.ec.gc.ca/udo/green.html">http://www.ns.ec.gc.ca/udo/green.html</a>	<a href="http://asiatravel.com/baliinfo.html#top">http://asiatravel.com/baliinfo.html#top</a>
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Nuttall (2000) suggests criteria teachers should take into consideration when they have to make a choice concerning reading materials in the classroom. The three main criteria she suggests are suitability of content, exploitability and readability. Moreover, she also raises concerns over whether the texts should be authentic as well as how they should be presented. As some of the criteria suggested by Nuttall has resemblances to the researcher's criteria, some of the relevant issues suggested will be discussed next.

Under the issue of suitability of content, Nuttall (2000, p. 170) suggests that "the text should interest the readers", while Carrell (1991) raises awareness over the effects of readers' content schemata. In other words, the texts should be of interest for readers to explore, but at that same time they should not pose significant problems to readers who have different background knowledge.

Since the participants in the study are all first-year students who are in the same age range, the topics of the environment and travel were found to be general enough for them to read with a considerable amount of interest while not causing difficulties due to lack of knowledge in specified topics. The participants' feedback with regard to the selection of texts after the think-aloud pilot was positive as they found the texts useful, informative, yet enjoyable to read.

The researcher's second criterion was based on the issue of readability which is defined by Nuttall (2000) as, "the combination of structural and lexical difficulty" (p. 174). Choosing a text with a suitable level of difficulty was one of the challenging tasks for the researcher as the study aims to investigate reading strategies employed between two groups of readers at different reading proficiencies, namely, high and low. Therefore, the level of difficulty in the reading texts should cater for both groups. On the one hand, there was a need to keep the texts challenging for the participants in both groups so that strategies used can be available for observation. On the other hand, if the reading tasks are too difficult, the participants would be become demotivated and they may guess or use avoidance strategies instead (Færch & Kasper, 1983).



After the three texts were selected, the researcher asked a number of Thai colleagues who have experience in teaching on the English Foundation Course to read them and asked for their comments. In general, they all agreed that the texts chosen were appropriate and suitable to be used with the students at the intermediate level. In the think-aloud pilot, the three texts were tried out with four students, each of whom was assigned to think-aloud on two texts as follows:

**Table 3.8 Text Allocation in Think-Aloud Pilot**

<b>Student's information</b>	<b>Text 1 "Global Warming is Real and Underway"</b>	<b>Text 2 "Did you Know We live in a Greenhouse?"</b>	<b>Text 3 "Bali Travel Information"</b>
Male (High <sup>a</sup> )	/	/	
Female (High)		/	/
Male (Low <sup>b</sup> )		/	/
Female (Low)	/		/

*Note.* The terms 'high' and 'low' are used to reflect their reading proficiency. The term 'high<sup>a</sup>' refers to the students with higher reading proficiency, while 'low<sup>b</sup>' refers to those with lower reading proficiency.

After the think-aloud pilot, it was found out that more reading strategies could be retrieved from, 'Did you know we live in a Greenhouse?' (Text 2) and 'Bali travel information' (Text 3), while many students expressed difficulties understanding the first text, 'Global warming is real and underway' which was later discarded.

The next criterion comes under the issue of authenticity. Authentic texts are perceived as "texts written for use by the foreign language community, not for language learners (Nuttall, 2000). This is because they have features of true discourse: "having something to say, being coherent and clearly organized. Composed (i.e. specially written) or simplified texts do not always have these qualities" (Nuttall, 2000, p.177). Carrell (1991, p. 170) points out that although the ideas of using authenticity in reading research may sound 'desirable', there are some other factors that need to be taken into consideration.



As suggested by Carrell (1984b), there is a need to take control of, for example, rhetorical organisation, length, and syntactic complexity. These variables make it difficult to use authentic texts in reading research unless they are modified to comply with all constraints. Carrell (1991, p. 170) suggests to “begin with authentic materials, modify them only as much as is needed, and try to preserve their authentic flavor.”

Based on suggestions made by Nuttall (2000) and drawn from previous studies in reading research (Carrell, 1991, 1984b), the researcher tried to strike a balance between the two ideas by keeping the texts as they appeared in their original versions as much as possible, while changes or simplifications were made only where necessary based on the results from the think-aloud pilot. Moreover, the researcher also tried to keep the two texts of equal length to control other possible side effects.

For the research purpose, the researcher inserted a small square (□) at the end of each sentence to mark where participants need to stop and verbalise their thoughts out loud. It was the same method developed by Olshavsky (1977) and later applied in Block (1986, 1992) with a red dot inserted in those studies.

Finally, to enhance the authentic look of the texts, the researcher presented Text 3, ‘Bali Travel Information,’ similar to the way it was found on the web page and included some pictures in Text 2, ‘Do you know we live in a Greenhouse?’. According to Nuttall (2000), this authentic presentation helps readers in establishing the contexts, and is particularly helpful especially with short texts. Having undergone a number of changes based on findings drawn from various sources, the researcher was confident that the two reading texts were suitable to be used in the main study and that the characteristics of the texts would encourage readers to employ metacognitive and cognitive strategies while reading them. Both texts can be found in Appendices D.1 and D.2 respectively.

### **3.2.2.1.3 Think-Aloud Procedure**

Cohen (1998) points out that instruction plays an important part and has a direct effect on the quality of think-aloud data. Ericsson and Simon (1993) emphasise that participants are required to verbalise only their thoughts while performing a task.



To prevent explaining their thoughts or describing what participants are doing, warm-up activities are found to be necessary. Not only do the activities assist them to familiarise themselves with verbalizing while performing a task, they also help researchers to find out about participants' verbal performance as well. Drawn from the suggestions and warm-up activities proposed by Ericsson and Simon (1984, 1993), the researcher modified the steps involved in the think-aloud pilot into 6 stages as follows:

**Stage 1 Introduction:** The students were told that the purpose of the study is to find out the reading strategies they use when reading English texts and not to test them personally. The researcher then explained a simple definition of 'think-aloud' to the students.

**Stage 2 Warm-Up:** The students were given initial warm-up problems to work on. This is to acquaint the students with the think-aloud report situation and accustom them to the microphones and tape recorders. The tasks used for training in verbal reporting were:

- a. doing simple mental arithmetic aloud (e.g.,  $450 \times 5$ )
- b. doing simple letter puzzles (e.g., a-p-r-s-t-s-o-p = passport)
- c. solving a picture jigsaw (e.g., an 8-piece of animal picture)

In the think-aloud pilot, the researcher asked the participants to make a mathematical calculation out loud and then worked on a jumbled word, 'a-p-r-s-t-s-o-p' by saying whatever comes to their mind while rearranging the letters. A picture jigsaw was also used where the participants had to talk their thoughts out loud while trying to put pieces of the picture in the right place. These activities worked out very well, and all of the participants had no problems in verbalizing their thoughts out loud while completing tasks.

**Stage 3 Instruction:** In this stage, the researcher gave a set of written directions in Thai/English to read and asked if they have any problems understanding the instructions. The translated think-aloud instructions can be found in Appendix D.3. The English version is as follows:



1. Imagine you are sitting alone in this room, and need to read an assigned text. The main purpose is to try to understand the texts as much as you can. You can use any reading strategies to help you.
2. You should read the text silently but stop reading when you come to a square sign (□).
3. At each square, talk about what happened in the text and about what you were doing and thinking as you read it. If you have difficulties reading or understanding them, what did you do to overcome the problems. After you have finished saying your thoughts out loud, you should proceed to the next sentence.
4. You should continue reading and talking this way until you reach the end. You will not be interrupted by any form of questions.
5. Don't forget that you are sitting by yourself, talking to yourself and not explaining what you are doing to anyone.
6. You will be tape recorded while thinking-aloud.

After that the researcher asked the students if they had difficulties understanding the instructions, the researcher then advanced to the next stage.

**Stage 4 Pre-think-aloud session:** At this stage, the students were given a short excerpt entitled, 'Irish Rose' to work on. The excerpt has been taken from a series in 'Tales of the Supernatural,' by Brennan (2004). The full excerpt can be found in Appendix D.4. The researcher made it clear to the students that the reading text they were going to read was for the purpose of practising only. The students then started thinking aloud.



#### **Irish Rose** □

'You were great, Mary!' □

'When is your next film, Miss Flyn?' □

'You must be thinking about an Oscar now, Mary!' □

The reporters all wanted to speak to her. □ All the photographers took pictures of her. □ Her long, black hair and clear skin were every fashion photographer's dream. □ Mary Flynn, Ireland's most photographed face, was famous and beautiful. □



**Table 3.9 A Sample of Student's Protocol**

Text	Translated student's protocols
Irish Rose	That illustration... I don't know if there's anything to do with the title or not, but 'Irish Rose' shouldn't have anything to do with an apple. Or is 'Irish Rose' a variety of apple trees? Why should it be there beside the title? There must somehow be related as it is an illustration, but I just don't know why.
'You were great, Mary!'	Oh, so there's a character named, 'Mary'.
'When is your next film, Miss Flyn?'	And Miss Flyn.
'You must be thinking about an Oscar now, Mary!'	... silence...

*Note.* This short sample of verbal protocol was collected from a female student with high reading proficiency level.

As can be seen from the Table 3.9, the researcher tried to get the students to do their own practice with minimal interruptions. However, if the student became silent as happened above, the researcher would encourage them to keep on talking by saying, 'Keep talking,' or 'Please remember to think aloud,' as this kind of statement did not trigger as questions for the students to respond to. There was no need for the students to complete the whole excerpt. Once the researcher felt that the students could verbalise their thoughts, they would be asked to stop and proceed to the next stage.

**Stage 5 Think-aloud session:** There were two reading texts for each student to read. They were asked to think-aloud on one text at a time. The information of text allocation was discussed earlier in Table 3.4. The students followed the reading-verbalising procedure they had practised. There was a few minutes' break before they started on the second text.

**Stage 6 Post-think-aloud session:** The students were allowed to ask questions at the end of the think-aloud session if they wished to. If not, the researcher thanked them for their participation and asked them not to disclose what they had read to other students to avoid having invalid data from other students.



### 3.2.2.2 Development of the Reading Categories

After the pilot study, there was a need to set up reading categorisation to analyse the students' verbalisations. In the area of reading research, there have been a number of studies carried out and a number of strategies have been proposed. Hosenfeld (1977) made a comparison in the way how successful and nonsuccessful readers employed different reading strategies when approaching texts. Based on her study, some of the effective strategies employed by good readers included keeping the meaning of the passage in mind, reading in broad phrases and skipping unimportant words or phrases. In the L1 reading context, Olshavsky (1977) proposed 10 strategies which are grouped under three main types of strategies: word-related strategies (e.g., synonym substitution), clause-related strategies (e.g., re-reading), and story-related strategy (e.g., use of information about the story).

In Block's study (1986), there are 15 strategies which are classified into two levels consisting of general comprehension and local linguistic strategies. The strategies in anticipating content, recognizing text structure are, for example, included in the first category of general comprehension, whereas the local strategies involve paraphrasing, rereading, etc.

Although these studies are helpful in establishing concepts of how reading strategies can be interpreted from verbal report data, reading categories found in the studies above, lack consistency across existing taxonomies and categorizations. This makes comparison across studies problematic.

As the framework proposed by O'Malley and Chamot (1990) forms an integral part of this study, their taxonomy of learning strategies could also be adopted to analyse think-aloud protocols. This will help the reading strategies developed become more consistent and more open to generalisation within studies carried out in the same domain. Although reading strategies are a subset of learning strategies, there are also initial differences between the two that need to be defined and adjusted to fit with the nature of L2 reading. Full details of how a taxonomy was adopted and the classifications made more relevant to reading strategies will be discussed in Chapter 5.



### 3.2.2.3 Coding of the Think-Aloud Data

After the think-aloud pilot, the protocols were transcribed and tentative categories were developed. As discussed in Chapter 2, O'Malley and Chamot's (1990) learning strategy framework is divided into three main categories, each of which consists of smaller corresponding sub-categories. The major strategies are classified as: metacognitive (i.e., advance organization), cognitive (i.e., resourcing), and social/affective (cooperation). There is an example below of how data were analysed into the sub-categories of learning strategies. It should be noted that the analysis at this stage was tentative and the proposed learning strategies will later be developed and elaborated on in the main study.

**Table 3.10 Tentative Coding System Based on a Student's Protocols**

<b>Text</b>	<b>Protocol</b>	<b>Sub-category</b>
Bali Travel Information	Bali... I really want to go there. Haven't been there myself.	Elaboration
Introduction	Looks like it's an introductory part.	Advance organization
There is a legend told of an island east of Java.	'Java?' What does it mean? I'll have a guess later.	Selective attention

*Note.* This data was collected from the same student as in Table 3.4.

### 3.2.2.4 Reflections from the Think-Aloud Pilot Study

The pilot provided a considerable amount of valuable experience in a number of ways. Firstly, the researcher has found concurrent data or think-aloud to be an effective research tool in gaining a direct route into the readers' thinking process. The immediacy of verbal methodology helps data reflect the students' own thinking process rather than interpreting or speculating on what they should say. Secondly, the researcher found training and instruction to be crucial factors in increasing the chance of having valid data. Having the students do warm-up activities and providing them with a clear set of instructions as suggested by Ericsson & Simon (1993), enabled them to have a practice think-aloud session and made them realise what was



expected of them. This enhanced the chance of obtaining the protocols which report their true behaviours.

Thirdly, the selection of the texts to be used has a direct effect on the students' verbal protocols. The texts need to be well-written, coherent and most importantly at the right level so that readers can exercise their thinking processes appropriately. Finally, in order to increase the rate of reliability, it was necessary to have two or three co-raters to help operating the classification system and the coding schemes (Cohen, 1998; McDonough & McDonough, 1997).

To sum up, the think-aloud pilot helped the researcher gain more confidence that it was the right research tool to be used in the main study which is also supported by Ericsson & Simon's (1980, p. 247) claim that if, "elicited with care and interpreted with full understanding of the circumstances under which they were obtained, [verbal reports] are a valuable and thoroughly reliable source of information about cognitive processes."

### **3.2.3 Reading Log**

The last type of research tool used in the main study to assess the students' reading strategies is in the format of diary writing, or as classified under the category of "diaries and dialog journals" by Cohen (1988, p. 24) and will be referred to in this study as a reading log. Although as pointed out by McDonough and McDonough (1997) the differences between the two terms are not clear cut, Cohen (1998, p. 38) uses the term "diary" when reference is made to "individual's written reflections on language learning" and "dialog journals" to suggest the use of a form to express learners' thoughts and emotions.

In this study, the use of reading log combines both characteristics as the students were required to reflect on their own reading process as well as include the problems they encounter as the same time. This supports Oxford's definition (1990, p. 198) in clarifying that, "diaries or journals are forms of self-report which allow learners to record their thoughts, feelings, achievements, and problems..."

The use of a reading log in addition to the strategy questionnaire and the think-aloud verbal report as discussed in earlier sections is in response to what is recommended by O'Malley and Chamot (1990) that data should be collected under the various conditions in which particular strategies are employed.



### 3.2.3.1 Strengths and Limitations

The use of a diary study as a research tool in the area of language teaching has a number of advantages. First, it can be implemented within a particular learning context so that language learning experiences can be documented (Bailey, 1990). Moreover, as suggested by Porter, Goldstein, Leatherman and Conrad (1990, p. 227), it encourages “more learner involvement in the learning process” under the communicative approach. According to Cohen (1998, p. 42), this also helps to raise learners’ awareness of their strategy use. Second, the data gained from diaries is rich in nature and can be analyzed qualitatively or quantitatively (Anderson, 1999; McDonough & McDonough, 1997). Finally, Halbach (2000) and Nunan (1992) treat the data collected from diaries and journals as distinctive and may not be collected through other research techniques.

However, there are also some limitations that come with a diary study. Firstly, since most diaries are written subjectively with no particular format, this makes diary entries difficult to analyse (O’Malley & Chamot, 1990; Oxford, 1990). Secondly, Cohen (1998) also stresses the problem of generalising the results to all language learners as each study normally consists of a small population.

In order to lessen the problem relating to subjective or uncontrolled writing, McDonough and McDonough (1997) and Oxford (1990) suggest that some guidelines should be given beforehand so that diaries can be less personal and learners know what is expected of them. Despite the limited number of learners involving in a diary study, its use can be viewed as “an open-ended narrative genre” providing valuable information on individual learners (McDonough & McDonough, 1997, p. 121).

### 3.2.3.2 Format and Procedure

In relation to the main study, a roughly structure of reading log was designed including four columns with their particular descriptive headings to give the students guidance on what they need to write about. (Refer to Appendix E for the form.) The reading log aims to reflect on how the students generally approach reading texts, what some of their reading problems are, what they do to solve those particular problems, and to what extent they were successful in dealing with them.



In the study, the use of the reading log is a part of the requirements for participation. The students were to hand in 3 reading logs throughout the term. The first one was due in the first week, while the next two were due mid-term and in the final week of the term.

To make sure the students' written verbal reports would reflect what they did during their reading process, they were instructed to follow the sequence of writing descriptive entries of what they truly did as closely as possible. Moreover, to ensure that both groups would write their diary entries in the same way, the students in the experimental group were asked not to use the strategy names in their reading log, but describe what they did in a naturalistic way. The analysis of the written verbal reports will be discussed in detail in the qualitative findings sections in Chapter 5.

#### **3.2.4 Reading Comprehension Test**

According to Mcnamara (2004), language testing is defined as, "a process of gathering information about test-takers from observed performance under test conditions" (p. 765). Davies (1990) sees language testing as helpful in providing goals for language teaching as well as monitoring both teachers' and learners' rate of success in reaching those specified goals. Moreover, it also "provides a methodology for experiment and investigation in both language teaching and language learning/acquisition" (p.1).

In relation to the current study which is experimental in nature, there is a need for a reading comprehension test to be administered. The benefit of the reading comprehension test is two-fold. First, the test will be used to measure the students' performance in their reading proficiency at the beginning of the course. Based on this, two levels of readers can be established; higher- and lower-proficiency. This helps with the selection of the students to take part in the think-aloud verbal study.

Second, the administration of the same test at the end of the course makes it possible for the average pre-and post-scores between the experimental and control groups to be compared. This helps to show reading strategy training has an effect on the students' performance at the end of their training.



According to Davies (1990), the test construction generally involves the following four stages of planning, prepiloting, piloting and final validation. The discussions in the following sections will be based on detailed accounts of what actually took place during the three main stages, firstly, planning, secondly, prepiloting and piloting and thirdly, final validation.

### 3.2.4.1 Planning Stage

In this early stage, a number of issues on the content and layout of the test as well as its format have to be considered. The sub-topics to be discussed in this section, therefore, include characteristics of the texts, test specifications and the test format to be used in the test.

#### 3.2.4.1.1 Characteristics of the Texts

The texts used in the test consist of three articles taken from magazines and the Internet which are written for general readers. According to Hughes (1989), these texts are considered to be ‘authentic’ as they are “intended for native speakers” (p.118). The subject areas are considered neutral about stress, animals, and computing. Details of the three main texts in the test are presented as below:

**Table 3.11 Characteristics of the Texts**

<b>Text</b>	<b>Title</b>	<b>No. of words</b>	<b>Source</b>
1	Are you too busy to be happy or healthy?	365	SHE Magazine
2	A 70-year love affair	531	BBC Wildlife Magazine
3	Life beyond Google	510	<a href="http://news.bbc.co.uk/1/hi/technology/3601371.stm">http://news.bbc.co.uk/1/hi/technology/3601371.stm</a>



### 3.2.4.1.2 Test Specifications

The reading skills to be included in the test are based on the following guidelines. In general, as a reading comprehension test, it aims to measure the students' ability to understand texts written for general readers. The texts are aimed at intermediate level and they utilise complex grammatical structures. The text length ranges from 350 to 600 words.

Specifically, the test questions are aimed at measuring students' ability in the reading skills of guessing unknown words from context, reading for main ideas, making inferences, reading for facts and opinions, and identifying a writer's purpose, attitude and tone. The inclusion of these skills has been dictated by the demands of English Foundation Course syllabus. The final test specifications can be summed up in the next table.

**Table 3.12 Test Specifications**

Reading skills	No. of items in the test	Example question from the test
1. Understanding details	7	Q6 What are some of the early signs of stress?
2. Finding main ideas	5	Q2 What is the main idea of paragraph 1?
3. Guessing unknown words from context	6	Q22 The word 'conducted' (paragraph 3, line 1) is closest in meaning to _____.
4. Making inference	3	Q12 According to paragraph 3, it can be inferred that Jane Goodall _____.
5. Identifying writer's purpose, attitude and tone	6	Q30 What is the tone of the passage?
6. Making reference	2	Q11 The word 'deed' (paragraph 2, line 7) could best be replaced by _____.
7. Predicting	1	Q10 What is the writer probably going to discuss in the next part of the article?
<b>Total:</b>	<b>30</b>	



### 3.2.4.1.3 Test Format

In relation to the test format, there are a number of test methods to choose from, some of which include questions and answers, multiple-choice, matching, cloze, gap filling, ordering tasks, summary gap and information-transfer techniques (Weir, 1990, 1993; Ur, 1996). As none of these corresponds to the ways people read texts in real life (Weir, 1993), the use of a variety of methods through formal and informal methods of assessment is suggested by Alderson (2000). While formal methods refer to techniques which are pencil-and-paper-based as mentioned above, informal methods of assessment to measure levels of students' achievement and proficiency include the use of miscue analysis and self-report techniques, including think-alouds, diaries, etc, (Alderson, 2000).

In the current study, the format of the test consists of 30 multiple-choice questions. Although they are considered to be "one of the most widely used types of items in objective tests" (Heaton, 1988, p. 27), there are a number of disadvantages involved in using this particular test format. For example, the task of identifying the correct or most appropriate option does not reflect what students have to do when they are reading in their real life. Moreover, as a test technique, students can be trained to do the test (Weir, 1993).

However, multiple-choice items are suitable in a testing situation where there are a large number of students as they are easy to mark resulting in having reliable scoring (Ur, 1996; Hughes, 1989). A number of points were also taken into consideration during the process of test writing. This was due to what is agreed by several writers (i.e., Alderson, 2000; Heaton, 1988; Hughes, 1989; Ur, 1996; and Weir, 1990) about the fact that good multiple-choice items are difficult to write.

Therefore, extra care was taken to ensure that all of the test items would be clear with one correct answer in each and that incorrect options would attract weaker students but not better ones. Moreover, the test questions are sequenced according to the information the students can find in the text. According to Peirce (1992, p. 670), this is also helpful for the students in building and developing their understanding, based on 'old' to 'given' pieces of information provided in the text.



In addition, Peirce (1992) suggests the use of closed stems with interrogative construction as this makes it easier for the students to interpret the meaning of the options compared to the use of open ones which are more time-consuming to understand and can create a burden on memory. However, the sentence-completion format is recommended in order to avoid interrogative construction which consists of complex structures within multiple clauses. This is in line with what is suggested by Weir (1993) that the use of language in phrasing test questions should be simple enough to understand. In most cases, a balance between types of questions is acceptable (Kirschner, Wexler & Spector-Cohen, 1992).

Although one main criticism of the multiple-choice type is based on the fact that it can encourage guessing, the choices that come with each item help to reduce the chance of wild guessing. In relation to the current study, the students were informed of the purpose of the test and that it was carried out to help them measure their reading performance and that the score did not count as part of the course assessment. Therefore, they should try their best so that the scores would reflect their true performance.

#### **3.2.4.2 Pre-Pilot and Pilot Stages**

Pretesting is a crucial stage in which the test questions can be tried out, and analysed for the levels of difficulty and discrimination so that the items which do not perform well can be rejected or modified.

After the test was constructed and completed in May 2004, the test was pre-piloted by a similar group of subjects to the ones who helped in completing the questionnaire as discussed earlier in Section 3.2.1.4. The subjects were helpful in making comments and giving feedback on some of the test items and options that were unclear, based on which some changes were made.

Before piloting, the test was distributed to some Thai colleagues for some comments on the clarity of stems and responses. This is in accordance with Weir (1993) in stating that, “test writing should not be a solitary activity” (p. 19). As experienced test writers themselves, the colleagues’ feedback was helpful and some changes were then made accordingly. The final test version can be found in Appendix F.



The test was piloted in September 2004 with the same group of 58 students who also helped out with the pilot of the questionnaire. The time allocation for the test was 45 minutes. The test went well, and the students did not report any problems with the test. They also managed to finish the test within the time limit. After the pilot, the test was marked and graded.

### **3.2.4.3 Final Validation Stage**

This section consists of two sub-topics, discussion of the statistical results and the issues of reliability and validity.

#### **3.2.4.3.1 The Statistical Results**

After piloting, statistical analysis of performance on the 30 items was carried out by using Classical Test Item Analysis (CITA)/Grading 7.0, which is a computer programme designed by Dr. Suphat Sukamolsun, Language Institute, Chulalongkorn University. The purpose of the item analysis is to find out the level of difficulty of each test item and its discriminating ability so that decisions can be made on which items need to be revised or discarded.

The results of the pilot test are average index of difficulty = .574, overall index of discrimination = .32, and the reliability index (KR20) = 0.617. Full details of the statistics of the scores can be found in Appendix G.1.

The index of difficulty ( $p$ ) of an item gives information on how easy or difficult each item is. The lower the values are, the more difficult the test items are. The facility values falling between 0.20 and 0.80 are generally acceptable (Sukamolsun, 1998). In a general test, there is a need to keep a range of test items with difficulty levels for different reasons. While difficult test items encourage the good students to do their best, too many of these items will put poorer students off.

Moreover, the inclusion of some easy items as found at the beginning of each passage helps to provide a lead-in and puts the students at ease. The average index of difficulty at 0.574 as found in the pilot test is found to be within the acceptable range.



Next, the discrimination index of an item ( $r$ ) which suggests how well the item discriminates between good and poor testees, can range from +1 through -1. The former (+1) suggests an item discriminates perfectly, while the latter (-1) suggests the opposite. According to Sukamolsun (1998), a discriminating level above 0.40 is considered to function most effectively, while any items between the range of 0.30 - 0.39 suggest moderate discriminating power. The overall index of discrimination of 0.32 as found in the pilot is, therefore, within a reasonable range.

The acceptable level of coefficient alpha (reliability) also referred to as KR-20 in this study, depends on how important the decisions which need to be made are. That is, the more important the decision, the greater index of reliability is demanded of it. Sukamolsun (1998) suggests the level of 0.75 for a standardised test, while a reliability of 0.7 as a minimum is accepted as a good test in some literature. As the reliability index (KR-20) of the current test at 0.617 is found to be slightly lower than what is required, some factors in justification of its low reliability will be discussed next.

In general, the pilot test was carried out on a small scale under research constraints. As a 30-item multiple-choice test administered to a group of 58 students, it had brought a number of consequences. First, due to the small group of students being tested, there was a small distribution of scores. With reference to the score statistics in Appendix G.2, the students' mean score of 17.21 with the standard deviation of 3.84 suggests a narrow score distribution around the mean. As found in Appendix G.3, there was also a close range of scores ranging from 25-10, which suggests that the students' reading ability were homogeneous. This is due to the fact that they were placed according to their English Entrance Examination (EEE) scores. The narrow spread of their scores contributes greatly to the low discriminating level which finally leads to the low reliability score for the test.

Moreover, the inclusion of easy items also has an effect on the discrimination index as can be referred to in Appendix G.4. Finally, it is a common practice for a test to be tried out and test items to be modified several times before it reaches acceptable statistical results and becomes established as a standardised test. Since the current test aims to be used as a research tool with no important decisions made as a result of its use, the present level of the reliability is acceptable. However, as the test was used for the first time, a number of test items were modified based on the statistical results before it was used again for the main study.



### **3.2.4.3.2 Reliability and Validity**

According to Davies (1990), reliability includes concepts of “the consistency of test judgments and results”, whereas validity concerns “the truth of the test, its relation to what it is intended to test” (p. 21). Both validity and reliability are chief criteria for evaluating any test. Heaton (1988) states that a reliable test without the presence of validity is certainly inadequate, while Weir (1993) points out that, “for a test to be valid, it must also be reliable” (p. 20). Bachman (1990) suggests these two aspects can be viewed as complementary.

The current test was constructed and developed while taking several aspects of validity into account. For example, in order to achieve the construct validity, the test was written by posing questions carefully around the reading skills as proposed in Table 3.12. According to Heaton (1988), a test whose content constitutes or represents particular component skills is also considered to have content validity.

Moreover, the test was circulated among colleagues as well as test experts to obtain some comments and feedback before pretesting. The test was viewed as appropriate and in accordance with the students’ level. All of the test stems, the correct answers as well as the distracters were well-written. These characteristics are contributing factors to face validity (Hughes, 1989). Although the test should ideally be reliable and valid, the issue of validity is seen to be of considerable importance by Heaton (1988, p. 164) who states that, “it is essential to devise a valid test first of all and then to establish ways of increasing its reliability.”

In spite of being a short test administered with a small number of students, the current test has proved itself statistically in a number of ways by complying with the criteria set for the item analysis and acquiring the qualities it needs to be a valid test. Within the context and the limitations of the research situation, the test was considerably suitable as a research tool.

### **3.2.5 Reading Strategy Training**

As the study aims to investigate the effect of the integration of reading strategy training, different methods of teaching are the key factors that need to be established and executed carefully.



In order to set up two different approaches of teaching reading, with- and without- strategy training, literature on strategy training was researched and an informal survey was also distributed to a group of Thai and foreign colleagues to gain some insights into how reading is taught and what reading procedures generally involve. The survey form can be found in Appendix H.1.

In teaching reading, the types of texts as well as their lengths are key factors in determining purposes of the reading lessons and ways how reading procedures are carried out in classroom. Although a distinction is made between intensive and extensive reading, (Nuttal, 2000) see them as “interrelated” and “complementary” to each other (p. 38). As the context of this study took place in a classroom setting involving the teaching of short reading texts, the focus of the reading lessons clearly reflects the nature of intensive reading. A further distinction is also made between skills-based and text-based intensive reading.

According to Nuttal’s definition (2000, p. 38), “a text-based lesson... is what we usually have in mind when referring to an intensive reading lesson: the text itself is the lesson focus, and students try to understand it as fully as necessary, using all the skills they have acquired.”

Taken into account the definition proposed by Nuttal and the results from the informal survey, it has become clear that the current teaching approach used among the researcher’s colleagues is of text-based nature. Therefore, the two reading approaches to be used for the control and experimental groups will be the text-based and strategy-based approaches respectively. Details of each approach will be discussed next.

### **3.2.5.1 Text-Based Approach**

Reading activities in a text-based lesson and as also applied to a general reading lesson are organised around the three stages of: pre-reading, while-reading, and post-reading. Details of reading activities at each stage as suggested by Aebersold and Field (1997), Devine (1986) and Nuttal (2000) will be discussed in the following section.



### **Pre-Reading Stage**

In order to facilitate effective reading, some of the reading activities at the pre-reading stage should include setting a purpose for reading, activating and building background knowledge and previewing.

In relation to the study, with the aim of establishing a purpose for reading, the students were sometimes asked to complete tasks such as skimming the text, scanning for specific pieces of information, or checking predictions they had made. Moreover, other activities including brainstorming, role plays, semantic mapping were also used as a pre-reading task to help the students activate their existing background knowledge of particular topics. Next, the students were also asked to preview a text. This was to help them find out about the text organisation and develop some ideas about its content. In addition, there was usually some work done on vocabulary reviews of some key words. This helped the students to build new vocabulary and increase their understanding while engaging in the reading process for the next stage.

### **While-Reading Stage**

The while-reading stage takes place when reading is underway. Nuttal (2000) suggests three different ways of how a reading lesson can be organised: the individual mode, the teacher-centred class and group work. As suggested by its name, the individual mode is not applicable to the current classroom practice and was not chosen. The teacher-centred class was favoured according to Nuttal's (2000) description, "In this mode, the class works with one text; the way it is tackled is controlled largely by the teacher, who decides the sequence of work, sets tasks, checks learning and tries to ensure that every student participates" (p. 162). However, the last mode, group work, was in use from time to time when interaction among students was required.

The questions provided in the earlier stage of pre-reading usually has an effect on the students' being occupied in searching for the answers at this stage of while-reading although as stated by Devine (1986), this stage also helps to give them a purpose for reading. Other reading tasks as suggested by Devine include immediate oral feedback, time lines and charts, listing main ideas, outlining and summarising.



With the implication of the above activities as well as what was cited in the survey, the students' tasks in the study varied according to the reading texts and the nature of the exercises that come with them, some of which include guessing unknown words, locating topic sentences and reading and doing exercises in groups.

### **Post-Reading Stage**

In the post-reading stage, what remains to be done includes going over information from the text, linking content with the students' experience or knowledge, finding out about students' opinions about or reactions to the text they have just read (Aebersold & Field, 1997; Devine, 1986; Nuttal, 2000).

Some extra post-reading activities also included explaining some parts of the text not fully understood by the students, going over the answers, doing some following-up activities related to the text, such as, carrying out a survey and role-play.

#### **3.2.5.2 Strategy-Based Approach**

A strategy-based approach is an alternative to skill-based and text-based approaches. According to Wallace (1992, p. 57), reading strategies refer to "ways of processing text which will vary with the nature of the text, the reader's purpose, and the context of situation." One of the basic aims in strategy training is to raise readers' awareness about their own thinking and learning strategies which are also referred to as metacognitive strategies (Wallace, 1992).

In order to do so, there is a need for the strategies to be explicitly explained, modelled, and reinforced by the classroom teacher in a contextualised language setting. By doing so helps students to become aware of the range of strategies that they can consciously choose from during the language learning process and improves their mastery of the target language (Cohen, 1998).

Some general steps in carrying out strategy training as proposed by Oxford (1990, p. 204) involve:

- 1) Determine the learner's needs and the time available.
- 2) Select strategies well.
- 3) Consider integration of strategy training.
- 4) Consider motivational issues.



- 5) Prepare materials and activities.
- 6) Conduct “completely informed training.”
- 7) Evaluate the strategy training.
- 8) Revise the strategy training.

In the current study, a set of reading strategies to be integrated into reading lessons as well as the model of reading strategy training have been developed from the framework of learning strategies taught in the Cognitive Academic Language Learning Approach (CALLA) proposed by O’Malley and Chamot (1990).

The adoption of the CALLA instructional model in the current reading strategy training complies with its main components in that it enables the students to develop the language skill of reading through direct instruction. Under its general guidelines, strategies already in use by students need to be identified first so that new strategies can be selected to be taught (O’Malley & Chamot, 1990). According to O’Malley and Chamot, different phases of a CALLA lesson including preparation, presentation, practice, evaluation, and expansion activities and these were applied in the preparation of a reading lesson for the experimental group, each of these phases will be discussed next.

**Preparation:** At the beginning of the lesson, the teacher activates students’ background knowledge of the strategies they already use. This can be done in pairs, small groups or with the whole class.

**Presentation:** New strategies are explicitly taught to students at this stage. The introduction of these strategies should be embedded in the context. Moreover, the strategy names as well as their importance should be explained so that students know when to use them.

**Practice:** It is in this stage where students have the opportunity to practise the strategies they have been taught by using the materials provided by the teacher. Think-aloud can also be encouraged among students. Coaching and teacher feedback should also be provided during this stage.



**Evaluation:** The focus is on student self-evaluation of the effectiveness of the strategies they use. This can be done through class discussions or learning strategies checklists.

**Expansion Activities:** Students are encouraged to apply strategy use to other tasks through discussions or brainstorming. Additional practice can be assigned.

According to O'Malley & Chamot (1990), the above five phases of learning strategy instruction are recursive as they can be repeated at any stage of the lesson if necessary so that they can be reviewed or reinforced.

### **3.2.5.3 Summary of the Reading Strategy Training**

The study took place in the second term in the academic year of 2004 which lasted for 4 months (November 2004 – February 2005). The researcher taught both experimental and control groups during the 16-week period of the academic term. Each group met twice a week on Wednesdays and Fridays. Each session lasted for the period of one and a half hours. In addition, there were 10 reading lessons with each group throughout the whole academic term. Details of the reading materials and a sample of lesson plans for both groups will be discussed in the next two subsections of 3.2.5.3.1 and 3.2.5.3.2.

#### **3.2.5.3.1 Reading Materials**

EL 172 Course Book was the core text book which covers the basic language skills in reading, writing, listening and speaking. There are 8 units, each of which consists of a main reading excerpt which needs to be taught in class together with its related vocabulary. Therefore, the main selections from 8 units form the basis of the reading materials, which the reading lessons were based on.

All of the reading materials are in Appendix H.2, while their details are summarised in Table 3.14.



**Table 3.13 Details of Reading Materials**

<b>Text</b>	<b>Title/Topic</b>	<b>Source</b>	<b>No. of words</b>
1	Best impression: Interview to get a job	Coursebook	519
2	Music	Coursebook	712
3	Jim Thomson	Coursebook	642
4	Ethics is paramount in photojournalism	Coursebook	738
5	Ice cream manufacture	Coursebook	903
6	A career of one's own	Coursebook	463
7	You are what you eat	Coursebook	585
8	A question of color: A debate on race in the US workplace	Coursebook	432

### 3.2.5.3.2 A Sample of Lesson Plans

Although similar reading passages based from the text book and supplementary materials were used during these lessons for the experimental and the control groups, the focus of the lesson and the methods of teaching were different. The researcher had two different sets of lesson plans and carried out the teaching differently for both groups.

As for the experimental group, the concept of reading strategies was integrated and practised during the reading lessons, whereas the control group did not receive instruction on reading strategies and were taught using the text-based approach. Each lesson plan for both groups revolves around the three basic stages of pre-, while-, and post-reading activities. However, the activities required to be done in the experimental group were planned differently and included the five phases which were discussed earlier. The first two phases of preparation and presentation were included in the pre-reading activities, while the last two phases of evaluation and expansion were treated as post-reading activities. The practice phase was kept the same for both approaches although the reading activities were organised differently.

Full lesson plans for the experimental and control groups can be found in Appendices H.3 and H.4 respectively, whereas a sample of basic lesson plans for the text- and strategy-based approaches will be summarised next.



**Table 3.14 Lesson Plan of Both Approaches**

<b>Stage</b>	<b>Experimental Group</b>	<b>Control Group</b>
<b>I. Pre-reading</b> (20 minutes)	<p><b><u>Preparation</u></b></p> <ul style="list-style-type: none"> <li>- <i>T*</i> diagnoses the strategies <i>Ss*</i> already use via think-aloud procedure.</li> </ul> <p><b><u>Presentation</u></b></p> <ul style="list-style-type: none"> <li>- T builds on strategies <i>Ss</i> already use.</li> <li>- T explicitly teaches the strategies by modelling and think-aloud while reading, using the term “strategy” and the names of the strategies (in the target language or in English).</li> <li>- T tells <i>Ss</i> why and how each strategy will help them, and when to use it.</li> </ul>	<ul style="list-style-type: none"> <li>- T asks <i>Ss</i> to think of what they know about the topic.</li> <li>- T asks <i>Ss</i> to review the title and text in order to make predictions.</li> <li>- <i>Ss</i> do pre-reading activities related to the reading passage.</li> <li>- T explains the vocabulary and the content of the passage to be read.</li> </ul>
<b>II. While-reading</b> (40 minutes)	<p><b><u>Practice</u></b></p> <ul style="list-style-type: none"> <li>- T has <i>Ss</i> practise the strategies by thinking aloud, talking about their thought processes while reading.</li> <li>- <i>Ss</i> think-aloud in pairs, in a group or class work.</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Ss</i> read the passage silently and do the task.</li> <li>- <i>Ss</i> compare the answers with friends.</li> </ul>
<b>III. Post-reading</b> (20 minutes)	<p><b><u>Evaluation</u></b></p> <ul style="list-style-type: none"> <li>- Probe to find out how <i>Ss</i> arrived at their answers.</li> <li>- Ask <i>Ss</i> to evaluate the effectiveness of each strategy and explain reasons for any difficulties they may have had in applying the strategies.</li> <li>- <i>Ss</i> think of what they might do differently next time to improve.</li> </ul> <p><b><u>Expansion</u></b></p> <ul style="list-style-type: none"> <li>- For homework, T asks <i>Ss</i> to apply some of the strategies to a different type of reading text and report their experiences in the next class.</li> <li>- T encourages <i>Ss</i> to read on their own and write about their reading experience in a reading log.</li> </ul>	<ul style="list-style-type: none"> <li>- T goes over the answers.</li> <li>- T carries out post-reading activities related to the reading passage.</li> <li>- For homework, T asks <i>Ss</i> to complete the rest of comprehension exercises.</li> <li>- T encourages <i>Ss</i> to read on their own and write about their reading experience in a reading log.</li> </ul>

*T\** = Teacher*Ss\** = Students



### 3.2.6 Data Analysis and Statistical Techniques

As mentioned earlier that two different approaches of quantitative and qualitative aspects have been combined in the main study. Therefore, different analyses are needed for the different types of data. The following table presents the research questions and the research tools used as well as the statistical techniques which were used.

**Table 3.15 Summary of Data Analysis and Statistical Techniques**

<b>Research question</b>	<b>Research tool</b>	<b>Statistical Technique</b>
1. What are the reading strategies the students in the experimental and control groups use when reading English texts?	1.1 Reading strategy questionnaire	1.1 Data based on the 45 statements are presented in rankings using descriptive statistics.
	1.2 Think-aloud verbal report	1.2 The results from think-aloud verbal reports are categorised and the types and frequencies of reading strategies are counted and described.
	1.3 Reading log	1.3 The results from reading logs are categorised and the types and frequencies of reading strategies are counted and described.
2. Is there any relationship between the students' level of reading proficiency and the types and frequencies of reading strategies reported?	2.1 Reading strategy questionnaire	2.1. The rate of correlation between the students' level of reading proficiency and the types and frequencies of reading strategies reported is discussed in detail.
	2.2 Think-aloud verbal report	2.2 The types and frequencies of strategies used between higher- and lower- proficiency students are compared and discussed.
	2.3 Reading log	2.3 The types and frequencies of strategies used between higher- and lower- proficiency students are compared and discussed.



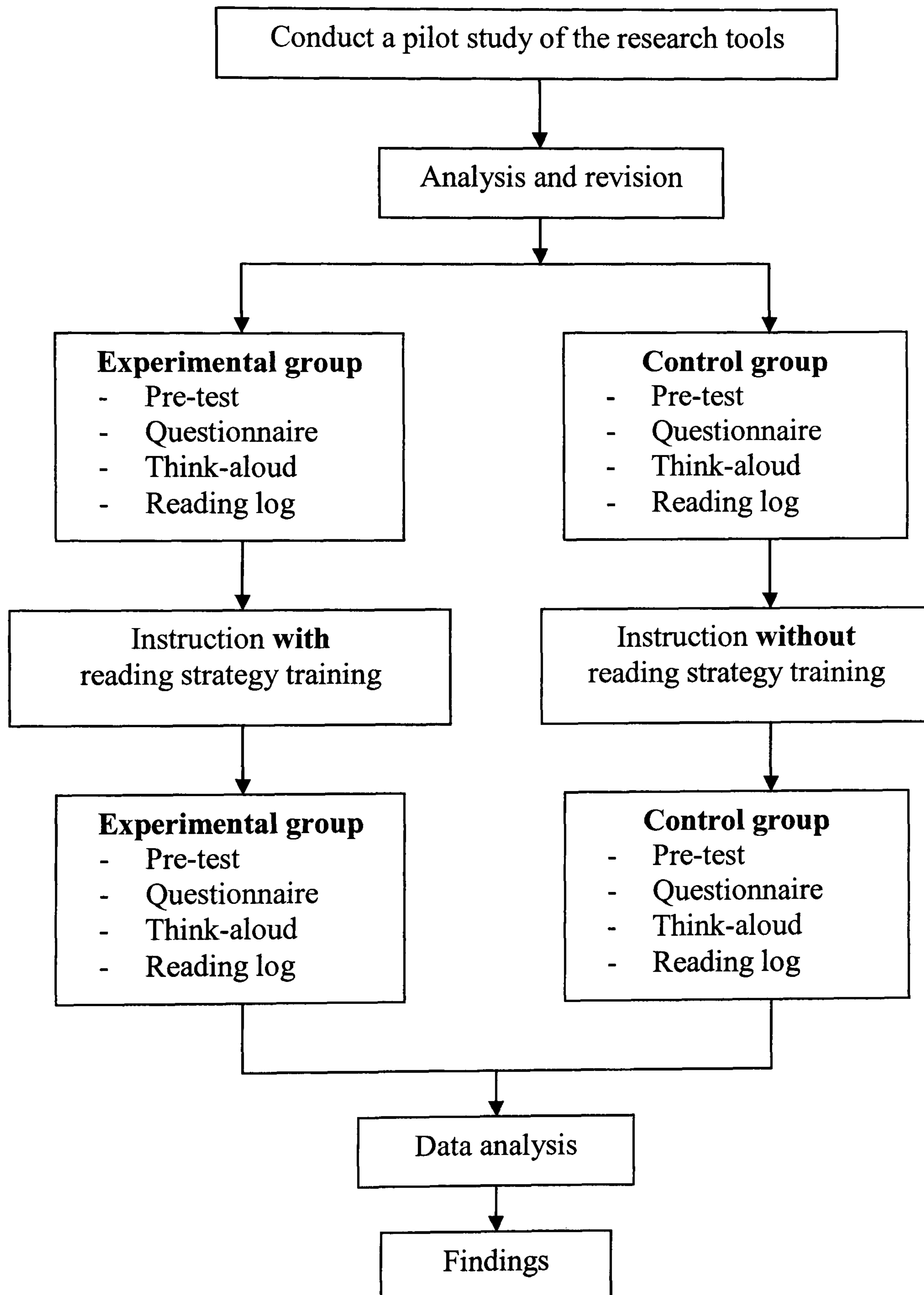
<b>Research question</b>	<b>Research tool</b>	<b>Statistical Technique</b>
3. What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?	3.1 Reading strategy questionnaire  3.2 Think-aloud verbal report  3.3 Reading log	3.1. The results from the pre- and post- questionnaire mean scores are compared and analyzed statistically using an independent samples t-test.  3.2 The types and frequencies of strategies used over time between the experimental and the control groups are compared and discussed.  3.3 The types and frequencies of strategies used over time between the experimental and the control groups are compared and discussed.
4. Does strategy training help the students in the experimental group to improve their reading proficiency significantly?	Reading comprehension test	The results from the test mean scores obtained before and after the instructional periods are compared and analysed statistically using a paired samples t-test.
5. Do the students in the control group benefit from the usual approach to teaching reading in improving their reading proficiency?	Reading comprehension test	The results from the test mean scores obtained before and after the instructional periods are compared and analysed statistically using a paired samples t-test.
6. To what extent do the students at different levels in both groups benefit from the two different teaching approaches?	Reading comprehension test	The students from both groups are sub-divided into three levels of high, medium, and low. The results from pre- and post- test mean scores are compared and analysed statistically using a one-way Anova test.



### 3.2.7 Summary of the Methodology

In order to give an overview of the whole research process, the methodology can be summarised as follows.

**Figure 3.2** Summary of the Methodology





### 3.2.8 Conclusion

The chapter provided a detailed outline of the research methodology, the research context and the population involved in the study. The main phases of the research process were discussed in detail followed by a diagram to represent the procedure visually. The main concerns over the issues of research reliability and validity were focused on as they are crucial requirements for all studies. As this was experimental research which took place in a natural classroom setting, extra care was taken to ensure that the conduct of the research did not put either group at a disadvantage. This issue was raised in ethical considerations.

The chapter also discussed the constructions of all the research tools which include a strategy reading questionnaire, a think-aloud verbal report, a reading log, a reading comprehension test and two sets of reading lesson plans. Their strengths and limitations of the research tools are discussed at length and these factors were taken into account while the research instruments were being developed to maximise their full potential. The pilot studies of some research tools, i.e., the strategy questionnaire and the reading test, as well as their statistical analyses were provided. Different types of reading approaches as applied during the reading strategy training in the experimental and control groups and their corresponding lesson plans can be found in both the main section and Appendix H.

Data analysis and statistical techniques were summed up in a table format to present both quantitative and qualitative aspects of the main study. The chart summary of the methodology was included at the end of the chapter to give an overview of the whole research process.

The discussion throughout the chapter helps to reflect the fact that careful steps were taken in preparing all research instruments and the different stages of research activities were carried out appropriately. This is to ensure that the study will succeed in achieving its aim and provide reliable and valid findings.



## **Chapter 4**

### **Findings of Quantitative Data**

The methodological concepts as well as the research tools used in the study have been discussed in the previous chapter. As data in the current study was derived from four different research tools consisting of a strategy questionnaire, a reading comprehension test, a verbal report, and a reading log, the results of the findings will be discussed in two separate chapters. The results based on the quantitative data findings of the reading strategy questionnaires and reading comprehension tests will be discussed in this chapter, whereas the findings based on think-aloud verbal reports and reading logs will be discussed in the next chapter.

The discussion in this chapter is based on the research questions previously presented in Chapter 3 and can be restated as follows:

1. What are the reading strategies the students in the experimental and the control groups use when reading English texts?
2. Is there any relationship between the students' level of reading proficiency and the types and frequencies of reading strategies reported?
3. What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?
4. Does strategy training help the students in the experimental group to improve their reading proficiency significantly?
5. Do the students in the control group benefit from the usual approach to teaching reading in improving their reading proficiency?
6. To what extent do the students at different levels in both groups benefit from the two different teaching approaches?

The discussion in the following sections attempts to answer the above research questions in the order presented above. While data from the questionnaires helps to reveal the students' use of reading strategies when reading texts in relation to types and frequencies, the scores from the tests reflect their reading ability. The results from the reading strategy questionnaires are presented in Section 4.1, and followed by discussion of the findings on test scores in Section 4.2.



## **4.1 The Results of the Reading Strategy Questionnaire**

The results of the reading strategy questionnaire aim to answer research questions 1, 2, and 3. The presentation of data is in the following order.

4.1.1 Overall Types and Frequencies of Reading Strategies Used by the Experimental and the Control Groups (Pre-Instruction)

4.1.2 The Relationship between the Students' Reading Level of Proficiency and the Types and Frequencies of Reading Strategies Reported (Pre-Instruction)

4.1.3 The Difference in Types and Frequencies of Reading Strategies Used over Time between the Experimental and the Control Groups

### **4.1.1 Overall Types and Frequencies of Reading Strategies Used by the Experimental and the Control Groups (Pre-Instruction)**

The reliability of the questionnaire used in the main study yields the Cronbach's alpha coefficient of .94 which is considered to be relatively high when compared to the standard value of .7 as suggested by Pallant (2004, p. 87). The questionnaire's statistical information can be found in Appendix C.2.

After the pre-questionnaire was completed, data based on the Likert-scale was analysed and presented in a table format which can be found in Table 4.1. The Likert-scale is based on the following criteria: 5 = always, 4 = usually, 3 = sometimes, 2 = seldom and 1 = never. The five columns present different pieces of information as follows. In the first column, the numbers represent the numerical order of statements as found in the questionnaire, while the second "Strategy" column consists of 45 reading strategies presented in short phrases for brevity. The statistical information which includes a mean score and its standard deviation (SD) are provided in the next two columns. The last column provides information in relation to the particular category to which each statement belongs. Full reference to the code system used is briefly given in the following paragraphs.

The five subcategories under metacognitive strategies are coded as follows: M1 = Advance organization, M2 = Advance preparation, M3 = Selective attention, M4 = Self-monitoring and M5 = Self-evaluation.



The subcategories under cognitive strategies are encoded by: C1 = Resourcing, C2 = Grouping, C3 = Note taking, C4 = Summarising, C5 = Deduction, C6 = Imagery, C7 = Auditory representation, C8 = Elaboration, C9 = Transfer and C10 = Inferencing.

The last three types of reading strategies under social and affective category are represented by S/A1 – S/A3, in which S/A1 = Questioning for clarification, S/A2 = Cooperation and S/A3 = Self-talk.

**Table 4.1 Overall Types and Frequencies of Reading Strategies Employed by the Experimental and the Control Groups (Pre-Instruction)**

Item No	Strategy	Mean	SD.	Type
1	skim read the text	3.77	1.06	M1
2	think about related vocabulary	2.70	1.14	M2
3	look up words in dictionary	3.98	0.85	C1
4	ask teacher for explanation	2.75	0.91	S/A1
5	set purpose before reading	2.50	0.87	M1
6	alright not to understand everything	3.53	1.03	S/A3
7	recognise author's opinion, tone & purpose	3.43	0.96	C10
8	make use of experience to help understanding	4.28	0.80	C8
9	underline or highlight important parts in text	3.90	0.95	M3
10	reread if do not understand	4.52	0.65	M4
11	evaluate if reading purpose is met	2.73	0.92	M5
12	draw diagrams to represent key concepts	2.20	1.04	C3
13	ask friends if do not understand	3.65	0.95	S/A1
14	read headings/sub-headings before reading text	3.98	0.98	M1
15	connect new information to old	3.67	0.95	C8
16	put a '?' in case of doubt	2.75	1.31	M4
17	try to identify reading problems if do not comprehend	3.18	0.87	M4
18	guess words meanings by using contexts	3.77	0.83	C10
19	try to create image of what is being read	3.78	0.96	C6
20	ask self if using effective reading strategies	2.92	1.09	M5
21	think about how text should be read	2.87	1.00	M2



22	check if prior guess is correct	3.08	1.01	M5
23	read & exchange information in group	2.98	0.97	S/A2
24	read more slowly with difficult texts	4.30	0.79	M4
25	write a summary of what has been read	2.52	0.91	C4
26	use illustrations to understand content of text	3.87	1.00	C10
27	preview text for its organization	3.33	0.90	M1
28	pronounce new words to help remember	3.08	1.11	C7
29	ask self if understanding what is being read	3.83	0.96	M4
30	make use of grammatical knowledge	3.12	1.12	C5
31	guess content from title	3.60	0.98	M1
32	think about how well text is understood	3.75	0.97	M5
33	apply similar techniques to when reading Thai	3.35	0.73	C9
34	take notes when reading	2.80	0.88	C3
35	use imagination to help understanding	4.02	0.85	C6
36	tell oneself text is not as difficult as it looks	3.05	1.13	S/A3
37	ignore unimportant details	2.78	0.80	M3
38	look for key words in a passage	3.93	0.84	M3
39	relate sound of new words to Thai	2.65	1.13	C7
40	encourage self to try harder	3.75	1.05	S/A3
41	scan for specific information	3.48	0.85	M3
42	ask questions about text while reading	3.12	0.87	M4
43	try to understand how things are grouped together	3.17	0.81	C2
44	translate what is being read into Thai	3.90	1.07	C9
45	make predictions about what is coming next	3.85	0.90	C10

Based on Table 4.1, the students' mean scores reveal that they used reading strategies extensively when reading English texts. The means of individual strategy items ranged from a high of 4.52 (item 10, reread if do not understand) to a low of 2.20 (item 12, draw diagrams to represent key concepts) with the overall mean of 3.38. Based on the criteria of mean scores suggested by Sheorey and Mokhtari (2001) which used the same type of Likert ranking scale, the following assumptions can be made.



According to the results of the questionnaire, 21 of the 45 strategies (47 %) are found in the high usage group (mean score of 3.5 or above), whereas 23 strategies (51%) fall in the medium usage group (mean between 2.50 and 3.49). There is only one strategy (2%) which remains in the low usage group (mean values below 2.4).

The next tables present the results of the questionnaire in relation to the rankings of reading strategies regarding the top-tens, mid-tens and bottom-tens. Individual reading strategy preferences are arranged in descending order according to their mean scores.

**Table 4.2 Top-Ten Reading Strategies Employed by Both Groups (Pre-Instruction)**

Item No.	Ranking	Strategy	M	S.D.	Type
10	1	reread if do not understand	4.52	0.65	M4
24	2	read more slowly with difficult texts	4.30	0.79	M4
8	3	make use of experience to help understanding	4.28	0.80	C8
35	4	use imagination to help understanding	4.02	0.85	C6
14	5	read headings/sub-headings before reading text	3.98	0.98	M1
3	6	look up words in dictionary	3.98	0.85	C1
38	7	look for key words in a passage	3.93	0.84	M3
9	8	underline or highlight important parts in text	3.90	0.95	M3
44	9	translate what is being read into Thai	3.90	1.07	C9
26	10	use illustrations to understand content of text	3.87	1.00	C10

The top ten reading strategies included an equal number of 5 metacognitive and 5 cognitive strategies with individual mean scores ranging between 4.52 – 3.87. Some of the most frequently used metacognitive strategies were “reread if do not understand” (item 10, M = 4.52) and “read more slowly with difficult texts” (item 24, M = 4.30). Some of the most favoured cognitive strategies are “make use of experience to help understanding” (item 8, M = 4.28) and “use imagination to help understanding” (item 35, M = 4.02). None of the strategies in the social/affective subcategory was found in the top-ten list. The next table presents ten reading strategies with moderate use by the students in the study when reading English texts.



**Table 4.3 Mid-Ten Reading Strategies Employed by Both Groups (Pre-Instruction)**

Item No.	Ranking	Strategy	M	S.D.	Type
32	16	think about how well text is understood	3.75	0.97	M5
40	17	encourage self to try harder	3.75	1.05	S/A3
15	18	connect new information to old	3.67	0.95	C8
13	19	ask friends if do not understand	3.65	0.95	S/A1
31	20	guess content from title	3.60	0.98	M1
6	21	alright not to understand everything	3.53	1.03	S/A3
41	22	scan for specific information	3.48	0.85	M3
7	23	recognise author's opinion, tone & purpose	3.43	0.96	C10
33	24	apply similar techniques to when reading Thai	3.35	0.73	C9
27	25	preview text for its organization	3.33	0.90	M1

The mid-ten reading strategies included four reading strategies in the metacognitive subcategory, three in the cognitive subcategory, and another three under social/affective strategies with the mean scores of individual strategies ranging between 3.75 - 3.33. Some of the more frequently used metacognitive strategies were found in rankings 16 and 20, “think about how well text is understood” (item 32, M = 3.75) and “guess content from title” (item 31, M = 3.60), whereas the rankings 17 and 19 belonged to the strategies in the social/affective subcategory. These included “encourage self to try harder” (item 40, M = 3.75) and “ask friends if do not understand” (item 13, M = 3.65).

Cognitive strategies were found between the rankings of 18 and 23, “connect new information to old” (item 15, M = 3.67) and “recognise author's opinion, tone & purpose” (item 7, M = 3.43).

The next table presents the ten least used reading strategies as found reported by the students in both groups.



**Table 4.4 Bottom-Ten Reading Strategies Employed by Both Groups (Pre-Instruction)**

Item No.	Ranking	Strategy	M	S.D.	Type
34	36	take notes when reading	2.80	0.88	C3
37	37	ignore unimportant details	2.78	0.80	M3
4	38	ask teacher for explanation	2.75	0.91	S/A1
16	39	put a '?' in case of doubt	2.75	1.31	M4
11	40	evaluate if reading purpose is met	2.73	0.92	M5
2	41	think about related vocabulary	2.70	1.14	M2
39	42	relate sound of new words to Thai	2.65	1.13	C7
25	43	write a summary of what has been read	2.52	0.91	C4
5	44	set purpose before reading	2.50	0.87	M1
12	45	draw diagrams to represent key concepts	2.20	1.04	C3

The bottom-ten reading strategies included five reading strategies in the metacognitive subcategory, four in the cognitive subcategory, and one in the social/affective category with the mean scores ranging between 2.80 – 2.20. The least used strategy was in the cognitive subcategory, “draw diagrams to represent key concepts” (item 12, M = 2.20). Some other infrequently used cognitive strategies included “write a summary of what has been read” (item 25, M = 2.52) and “relate sound of new words to Thai” (item 39, M = 2.65), whereas some of the least favoured metacognitive strategies were “set purpose before reading” (item 5, M = 2.50) and “think about related vocabulary” (item 2, M = 2.70). The only reading strategy found in this section in the social/affective subcategory was “ask teacher for explanation” (item 4, M = 2.75).

As the classification is in metacognitive, cognitive, social and affective categories, the results of the frequencies of strategy use are discussed in relation to the particular category they belong to in the following sections.

#### 4.1.1.1 Metacognitive Strategies

#### 4.1.1.2 Cognitive Strategies

#### 4.1.1.3 Social and Affective Strategies



### 4.1.1.1 Metacognitive Strategies

As defined in Chapter 2, metacognitive strategies refer to “attempts or initiations readers consciously take to facilitate their reading process including making a plan, monitoring and checking their understanding”. In the current study, they are classified into five subcategories of M1 Advance organization, M2 Advance preparation, M3 Selective attention, M4 Self-monitoring, and M5 Self-evaluation. Before data concerning metacognitive strategies are presented subcategorically, the overall 21 metacognitive strategies can be presented in the following tables in relation to their mean scores and standard deviation as follows:

**Table 4.5 Overall Metacognitive Strategies**

Item No.	Strategy	M	S.D.	Type
1	skim read the text	3.77	1.06	M1
2	think about related vocabulary	2.70	1.14	M2
5	set purpose before reading	2.50	0.87	M1
9	underline or highlight important parts in text	3.90	0.95	M3
10	reread if do not understand	4.52	0.65	M4
11	evaluate if reading purpose is met	2.73	0.92	M5
14	read headings/sub-headings before reading text	3.98	0.98	M1
16	put a '?' in case of doubt	2.75	1.31	M4
17	try to identify reading problems if do not comprehend	3.18	0.87	M4
20	ask self if using effective reading strategies	2.92	1.09	M5
21	think about how text should be read	2.87	1.00	M2
22	check if prior guess is correct	3.08	1.01	M5
24	read more slowly with difficult texts	4.30	0.79	M4
27	preview text for its organization	3.33	0.90	M1
29	ask self if understanding what is being read	3.83	0.96	M4
31	guess content from title	3.60	0.98	M1
32	think about how well text is understood	3.75	0.97	M5
37	ignore unimportant details	2.78	0.80	M3
38	look for key words in a passage	3.93	0.84	M3
41	scan for specific information	3.48	0.85	M3
42	ask questions about text while reading	3.12	0.87	M4



The means of metacognitive strategies ranged from a high of 4.52 to a low of 2.50 with the overall mean of 3.38. The most frequently used strategies were in the subcategory of M4 Self-monitoring including “reread if do not understand” (item 10,  $M = 4.52$ ) and “read more slowly with difficult texts” (item 24,  $M = 4.30$ ). The least used strategy was “set purpose before reading” (item 5,  $M = 2.50$ ).

Next, the discussion is based on presenting data in relation to individual metacognitive subcategories.

### **M1 Advance Organization**

The subcategory of M1 Advance organization aims to investigate how often the students skim through the text or scan particular sections or headings before starting to read in detail. The statements involve five metacognitive strategies and can be presented together with their frequencies as follows:

**Table 4.6 Frequency of M1 Advance Organization**

<b>Item No.</b>	<b>Ranking</b>	<b>Strategy</b>	<b>M</b>	<b>S.D.</b>
1	2	skim read the text	3.77	1.06
5	5	set purpose before reading	2.50	0.87
14	1	read headings/sub-headings before reading text	3.98	0.98
27	4	preview text for its organization	3.33	0.90
31	3	guess content from title	3.60	0.98

Based on Table 4.6, the most frequently used strategies were “read headings/sub-headings before reading text” (item 14,  $M = 3.98$ ) and “skim read the text” (item 1,  $M = 3.77$ ), while the least used strategy was “set purpose before reading” (item 5,  $M = 2.50$ ). The mean scores ranged between 3.98 – 2.50 with the average score of 3.44 suggesting a medium usage. This indicates that the students in the study browsed through the text by skimming its main elements, i.e., title, headings, and sub-headings although they did not frequently set their reading purpose of why they had to read the particular text before reading.



## M2 Advance Preparation

The subcategory of M2 Advance preparation aims to find out if the students make a plan of how they are going to read a text and consists of two strategies. Their frequencies can be presented as follows:

**Table 4.7 Frequency of M2 Advance Preparation**

Item No.	Ranking	Strategy	M	S.D.
2	2	think about related vocabulary	2.70	1.14
21	1	think about how text should be read	2.87	1.00

The data presented in Table 4.7 reveals that between the two metacognitive strategies, the students showed preference for using item 21, “think about how text should be read” (M= 2.87) to item 2, “think about related vocabulary” (M = 2.70). With the average mean score of 2.78, it can be stated that the students did not normally plan how they were going to read the text. This may be due to the fact that they had rarely been taught this in their reading lessons.

## M3 Selective Attention

The subcategory of M3 Selective attention involves four strategies which aim to find out if the students pay attention to key words or phrases when reading. Their average means are as follows:

**Table 4.8 Frequency of M3 Selective Attention**

Item No.	Ranking	Strategy	M	S.D.
9	2	underline or highlight important parts in text	3.90	0.95
37	4	ignore unimportant details	2.78	0.80
38	1	look for key words in a passage	3.93	0.84
41	3	scan for specific information	3.48	0.85



According to Table 4.8, the most frequently used strategy in this subcategory was “look for key words in a passage” (item 38,  $M = 3.93$ ), while the least used strategy was item 37, “ignore unimportant details” ( $M = 2.78$ ). The average mean of 3.52 suggests that the students usually paid attention to key words, phrases as well as punctuation when reading.

#### **M4 Self-Monitoring**

The subcategory of self-monitoring aims to investigate if the students consciously check that they understand what they are reading. The subcategory is presented in six different statements. The results of the findings are as follows:

**Table 4.9 Frequency of M4 Self-Monitoring**

<b>Item No.</b>	<b>Ranking</b>	<b>Strategy</b>	<b>M</b>	<b>S.D.</b>
10	1	reread if do not understand	4.52	0.65
16	6	put a '?' in case of doubt	2.75	1.31
17	4	try to identify reading problems if do not comprehend	3.18	0.87
24	2	read more slowly with difficult texts	4.30	0.79
29	3	ask self if understanding what is being read	3.83	0.96
42	5	ask questions about text while reading	3.12	0.87

According to Table 4.9, the highest-ranked mean was found at the frequency of 4.52, while the lowest yielded the result of 2.75. Some of the most used strategies were “reread if do not understand” (item 10,  $M = 4.52$ ) and “read more slowly with difficult texts” (item 24,  $M = 4.30$ ), while the lowest used strategy was found in item 16, “put a ‘?’ in case of doubt”. With the result of the average mean score of 3.62, it can be concluded that the students make use of the reading strategies under M4 subcategory at a high rate. This means the students monitored their comprehension constantly while reading by varying the way how they approached the text, such as, rereading it and reading more slowly. Moreover, they tried to identify some of the reading problems they were having.



## M5 Self-Evaluation

Self-evaluation is the last subcategory of metacognitive strategies which aims to investigate if the students try to evaluate how well the text is understood. The strategies as well as their frequencies are presented as follows:

**Table 4.10 Frequency of M5 Self-evaluation**

Item No.	Ranking	Strategy	M	S.D.
11	4	evaluate if reading purpose is met	2.73	0.92
20	3	ask self if using effective reading strategies	2.92	1.09
22	2	check if prior guess is correct	3.08	1.01
32	1	think about how well text is understood	3.75	0.97

Based on Table 4.10, the most preferred strategy used was “think about how well text is understood” (item 32,  $M = 3.75$ ), while the lowest was item 11, “evaluate if reading purpose is met” ( $M = 2.73$ ). However, the average score of 3.12 which was the lowest in comparison with the other four metacognitive subcategories indicates that the students in the study did not make use of the above reading strategies as often as they could have done. In other words, when they finished reading, they did not normally evaluate how well they understood what they had read.

### 4.1.1.2 Cognitive Strategies

As defined in this study, cognitive strategies are “steps readers take while engaging in the reading process to maximise their comprehension by making use of their available resources, previous knowledge or experience”.

The total of eighteen statements under cognitive strategies are subdivided into ten subcategories of C1 Resourcing, C2 Grouping, C3 Note taking, C4 Summarising, C5 Deduction, C6 Imagery, C7 Auditory representation, C8 Elaboration, C9 Transfer, and C10 Inferencing. The overall mean scores, their standard deviations, as well as the particular type each strategy belongs to can be found in the next table.



**Table 4.11 Overall Cognitive Strategies**

Item No.	Strategy	M	S.D.	Type
3	look up words in dictionary	3.98	0.85	C1
7	recognise author's opinion, tone & purpose	3.43	0.96	C10
8	make use of experience to help understanding	4.28	0.80	C8
12	draw diagrams to represent key concepts	2.20	1.04	C3
15	connect new information to old	3.67	0.95	C8
18	guess words meanings by using contexts	3.77	0.83	C10
19	try to create image of what is being read	3.78	0.96	C6
25	write a summary of what has been read	2.52	0.91	C4
26	use illustrations to understand content of text	3.87	1.00	C10
28	pronounce new words to help remember	3.08	1.11	C7
30	make use of grammatical knowledge	3.12	1.12	C5
33	apply similar techniques to when reading Thai	3.35	0.73	C9
34	take notes when reading	2.80	0.88	C3
35	use imagination to help understanding	4.02	0.85	C6
39	relate sound of new words to Thai	2.65	1.13	C7
43	try to understand how things are grouped together	3.17	0.81	C2
44	translate what is being read into Thai	3.90	1.07	C9
45	make predictions about what is coming next	3.85	0.90	C10

Based on Table 4.11, the average mean of cognitive strategies ranged from a high of 4.28 to a low of 2.20 with the overall mean of 3.41. The most frequently used cognitive strategies were in the subcategories of C8 Elaboration and C6 Imagery which were “make use of experience to help understanding” (item 8, M = 4.28) and “use imagination to help understanding” (item 35, M = 4.02). The least used strategy was found in the cognitive subcategory of C3 Note taking, “draw diagrams to represent key concepts” (item 12, M = 2.20).



## C1 Resourcing

There is only one statement that reflects if the students make use of other reference materials to help them improve their comprehension. The corresponding statement with its mean score is found below:

**Table 4.12 Frequency of C1 Resourcing**

Item No.	Ranking	Strategy	M	S.D.
3	1	look up words in dictionary	3.98	0.85

With the mean score of 3.98 in item 3, it can be presumed that the students used a dictionary quite often to look up for meanings of unknown words.

## C2 Grouping

The use of cognitive strategy under the subcategory of C2 Grouping aims to find out if the students try to relate concepts when reading and is reflected in the following strategy.

**Table 4.13 Frequency of C2 Grouping**

Item No.	Ranking	Strategy	M	S.D.
43	1	try to understand how things are grouped together	3.17	0.81

Based on the result of the questionnaire, item 43, “try to understand how things are grouped together” yielded an average of 3.17 which suggests that the students only sometimes try to relate concepts while reading.



### C3 Note Taking

There are two statements responding to the subcategory of C3 Note taking which aims to investigate if the students take notes while reading. Their frequencies and standard deviation are provided as follows:

**Table 4.14 Frequency of C3 Note taking**

Item No.	Ranking	Strategy	M	S.D.
12	2	draw diagrams to represent key concepts	2.20	1.04
34	1	take notes when reading	2.80	0.88

As found in Table 4.14 the mean scores for both item 12, “draw diagrams to represent key concepts” and item 34, “take notes when reading” were 2.20 and 2.80 respectively which results in the average mean score of 2.50. In comparison with the other cognitive subcategories, this overall mean figure represents the lowest frequency of all and suggests that the students in the current study seldom take notes of what they read.

### C4 Summarising

The reading strategy under the subcategory of C4 Summarising aims to explore whether the students make a summary of what they have read and is reflected in the following table:

**Table 4.15 Frequency of C4 Summarising**

Item No.	Ranking	Strategy	M	S.D.
25	1	write a summary of what has been read	2.52	0.91

The mean frequency of 2.52 also suggests that the students did not normally make a summary of what they read. Low frequencies of both C3 and C4 may have resulted from the fact that the nature of the reading materials the students had been reading were more general so there was no need for them to take notes for future reference.



### C5 Deduction

Based on the questionnaire, there is one strategy under the subcategory of C5 Deduction which aims to investigate if the students use grammatical rules to assist comprehension when reading. The results regarding this statement can be found in the following table:

**Table 4.16 Frequency of C5 Deduction**

Item No.	Ranking	Strategy	M	S.D.
30	1	make use of grammatical knowledge	3.12	1.12

The mean score of 3.12 in item 30, “make use of grammatical knowledge” suggests that the students did not normally use grammatical rules to assist their comprehension while reading.

### C6 Imagery

The two reading strategies responding to the subcategory of C6 Imagery aim to explore if the students make use of visual images to better their comprehension of the text. The strategies together with their mean scores are presented below:

**Table 4.17 Frequency of C6 Imagery**

Item No.	Ranking	Strategy	M	S.D.
19	2	try to create image of what is being read	3.78	0.96
35	1	use imagination to help understanding	4.02	0.85

According to Table 4.17, the result of the average score of 3.90 reveals that the students used both strategies at a high rate although there was a small difference between the two. That is, they preferred to “use imagination to help understanding” (item 35, M = 4.02) to “create image of what is being read” (item 19, M = 3.78).



### C7 Auditory Representation

The use of the cognitive subcategory of C7 Auditory representation aims to investigate if the students vocalise while reading. The strategies are as follows:

**Table 4.18 Frequency of C7 Auditory Representation**

Item No.	Ranking	Strategy	M	S.D.
28	1	pronounce new words to help remember	3.08	1.11
39	2	relate sound of new words to Thai	2.65	1.13

As can be seen from Table 4.18, the students “pronounce new words to help remember (item 28, M = 3.08) more often than “relate sound of new words to Thai” (item 39, M = 2.65). However, the average of both strategies at 2.87 suggests that they used this cognitive subcategory from time to time.

### C8 Elaboration

There are two reading strategies which come under the subcategory of C8 Elaboration which help to find out how often the students make use of their academic as well as world knowledge to help them understand the content of the text.

**Table 4.19 Frequency of C8 Elaboration**

Item No.	Ranking	Strategy	M	S.D.
8	1	make use of experience to help understanding	4.28	0.80
15	2	connect new information to old	3.67	0.95

According to Table 4.19, the students preferred to “make use of experience to help understanding what they are reading” (item 8, M = 4.28). However, they also try to “connect new information to old” (item 15, M = 3.67). The average means of both strategies at 3.98 suggests that they usually made use of their experience to help with comprehension.



## C9 Transfer

In order to find out if the students in the current study use the subcategory of C9 Transfer to help remember and recall, the following statements have been included in the questionnaire.

**Table 4.20 Frequency of C9 Transfer**

Item No.	Ranking	Strategy	M	S.D.
33	2	apply similar techniques to when reading Thai	3.35	0.73
44	1	translate what is being read into Thai	3.90	1.07

The students show preference to “translate what is being read into Thai” (item 44, M = 3.90) to “applying similar techniques to when reading Thai” (item 33, M = 3.35). Based on the average mean score of 3.63, it can be concluded that they used these two strategies moderately.

## C10 Inferencing

In order to find out how often the students make inferences by guessing or drawing logical inferences from the text while reading, four statements under C10 Inferencing have been included in the questionnaire.

**Table 4.21 Frequency of C10 Inferencing**

Item No.	Ranking	Strategy	M	S.D.
7	4	recognise author's opinion, tone & purpose	3.43	0.96
18	3	guess words meanings by using contexts	3.77	0.83
26	1	use illustrations to understand content of text	3.87	1.00
45	2	make predictions about what is coming next	3.85	0.90



Based on Table 4.21, the mean scores of each statement were within a narrow range of 3.87 – 3.43. The two most highly used strategies were “use illustrations to understand content of text” (item 26, M = 3.87) and “make predictions about what is coming next” (item 45, M = 3.85), while the other two strategies of “guess words meanings by using contexts” (item 18, M =3.77) and “recognise author's opinion, tone & purpose” (item 7, M = 3.43) received slightly lower average mean scores. The overall mean score of 3.73 suggests moderate use of the four strategies.

#### 4.1.1.3 Social/Affective Strategies

In this study, social/affective strategies are defined as “methods readers use when having reading problems”. The strategies can be used through interaction or cooperation with others. The reading strategies under social/affective strategies are subdivided into three subcategories of S/A1 Questioning for clarification, S/A2 Cooperation, and S/A3 Self-talk. The six reading strategies with their particular overall mean scores can be found in the following table:

**Table 4.22 Overall Social/Affective Strategies**

Item No.	Strategy	M	S.D.	Type
4	ask teacher for explanation	2.75	0.91	S/A1
6	alright not to understand everything	3.53	1.03	S/A3
13	ask friends if do not understand	3.65	0.95	S/A1
23	read & exchange information in group	2.98	0.97	S/A2
36	tell oneself text is not as difficult as it looks	3.05	1.13	S/A3
40	encourage self to try harder	3.75	1.05	S/A3

The mean scores of social/affective strategies ranged from a high of 3.75 to a low of 2.75 with the overall mean of 3.29. The most frequently used strategies were in the subcategory of S/A3, “encourage self to try harder” (item 40, M = 3.75). The least used strategy was “ask teacher for explanation” (item 4, M = 2.75).



### S/A1 Questioning for Clarification

The S/A1 Questioning for clarification consists of two statements to investigate how readers prefer to seek help from others and can be presented in the following table:

**Table 4.23** Frequency of S/A1 Questioning for Clarification

Item No.	Ranking	Strategy	M	S.D.
4	2	ask teacher for explanation	2.75	0.91
13	1	ask friends if do not understand	3.65	0.95

The strategies in this subcategory suggest two possibilities of how the students seek help from others for further explanation. Although the average score of 3.2 suggests moderate use of both strategies, as can be seen in Table 4.23, the students showed preference to “ask friends if do not understand” (item 13, M = 3.65) rather than “ask teacher for explanation” (item 4, M = 2.75).

### S/A2 Cooperation

There is one statement under the subcategory of S/A2 Cooperation to investigate how often the students work with others to build up comprehension.

**Table 4.24** Frequency of S/A2 Cooperation

Item No.	Ranking	Strategy	M	S.D.
23	1	read & exchange information in group	2.98	0.97

Based on Table 4.24, the students showed a low level of preference for working with others to build up their comprehension of the text. This also helps to confirm that reading is an individual activity as mentioned earlier in Chapter 2. With a mean score of 2.98 for item 23, “read & exchange information in group”, this suggests low use of this particular strategy amongst students in the research groups.



### S/A3 Self-Talk

The last social/affective subcategory of S/A3 Self-talk consists of three reading strategies aiming to investigate how the students motivate themselves to read.

**Table 4.25** Frequency of S/A3 Self-Talk

Item No.	Ranking	Strategy	M	S.D.
6	2	alright not to understand everything	3.53	1.03
36	3	tell oneself text is not as difficult as it looks	3.05	1.13
40	1	encourage self to try harder	3.75	1.05

According to Table 4.25, the average score of the three reading strategies was 3.44 which indicates frequent use. Moreover, the average score for each strategy from a high of 3.75 to a low of 3.05 suggests that the students frequently motivated themselves to read. In ranking order, the students utilized the strategy “encourage self to try harder” (item 40,  $M = 3.75$ ) more frequently than told themselves it is “alright not to understand everything” (item 6,  $M = 3.53$ ) and the least used strategy was “tell oneself text is not as difficult as it looks” (item 6,  $M = 3.05$ ).

#### 4.1.2 The Relationship between the Students’ Reading Level of Proficiency and the Types and Frequencies of Reading Strategies Reported (Pre-Instruction)

The discussion in this section addresses the second research question by interpreting data from the reading strategy questionnaires in relation to the types and frequencies of strategies used and to the students’ level of reading proficiency as measured by their reading comprehension test scores. As the focus in this section is on the investigation of the reading strategies used by high- and low-scoring students, the students had to be grouped according to their scores. In order to have valid groups of students with high- and low-scores, the process of putting their scores into groups was executed by SPSS.



After the students' distribution of scores and their cut-off points were established, the number of students in each group can be presented as follows:

**Table 4.26**     **Distribution of Pre-Test Scores in Different Levels of Proficiency**

<b>Level of proficiency</b>	<b>Range of scores</b>	<b>Frequency</b>
Low	below 12	22
High	above 15	26
<b>Total</b>		<b>48</b>

The types and frequencies of reading strategies used by both groups are discussed in three main sections as follows:

4.1.2.1 Types and Frequencies of Metacognitive Strategies Employed by High-and Low-Scoring Students

4.1.2.2 Types and Frequencies of Cognitive Strategies Employed by High-and Low-Scoring Students

4.1.2.3 Types and Frequencies of Social/Affective Strategies Employed by High-and Low-Scoring Students

#### **4.1.2.1            Types and Frequencies of Metacognitive Strategies Employed by High- and Low-Scoring Students**

The data to be presented in the next table is based on the average means of 21 statements from the metacognitive category used by 2 different groups of students. Both sets of mean scores are analysed by using an independent-samples t-test to compare the mean scores between these two groups.



**Table 4.27** Frequency of Metacognitive Strategies Used by High- and Low-Scoring Students

Item no.	Strategy	High (n = 26)		Low (n = 22)		t	P
		M	S.D.	M	S.D.		
1	skim read the text	3.85	1.12	3.64	1.09	-0.65	0.52
2	think about related vocabulary	2.54	1.27	2.82	1.14	0.80	0.43
5	set purpose before reading	2.27	0.78	2.5	0.86	0.98	0.33
9	underline or highlight important parts in text	3.69	0.97	3.95	0.95	0.94	0.35
10	reread if do not understand	4.42	0.76	4.55	0.51	0.67	0.51
11	evaluate if reading purpose is met	2.65	0.94	2.68	0.84	0.11	0.91
14	read headings/sub-headings before reading text	3.96	1.00	4	0.98	0.13	0.89
16	put a '?' in case of doubt	2.77	1.39	2.59	1.22	0.47	0.64
17	try to identify reading problems if do not comprehend	3.23	0.95	3.18	0.91	-0.18	0.86
20	ask self if using effective reading strategies	3.04	1.18	2.82	0.80	-0.77	0.45
21	think about how text should be read	2.69	1.09	2.95	0.90	0.90	0.37
22	check if prior guess is correct	2.65	1.06	3.27	0.88	2.18	0.04*
24	read more slowly with difficult texts	4.46	0.71	4.14	0.77	-1.52	0.14
27	preview text for its organization	3.19	0.90	3.27	0.83	0.32	0.75
29	ask self if understanding what is being read	3.88	0.95	3.77	1.02	-0.39	0.70
31	guess content from title	3.54	1.10	3.55	0.86	0.02	0.98
32	think about how well text is understood	3.69	1.01	3.82	0.96	0.44	0.66
37	ignore unimportant details	2.65	0.80	2.86	0.83	0.89	0.38
38	look for key words in a passage	3.96	0.77	3.82	1.01	-0.55	0.59
41	scan for specific information	3.42	0.86	3.55	0.96	0.47	0.64
42	ask questions about text while reading	2.85	0.83	3.32	0.84	1.95	0.06

\* The mean difference is significant at the 0.05 level.

Data from Table 4.27 reveal that among the more proficient students, the means of individual strategy items used ranged from a high of 4.46 to a low of 2.27. Some of the highly-used metacognitive strategies were in the subcategory of M4 Self-monitoring. They were, “read more slowly with difficult texts” (item 24, M = 4.46), followed by “reread if do not understand” (item 10, M = 4.42). The least used strategy was found in the subcategory of M1 Advance organization, “set purpose before reading” (item 5, M = 2.27).



Moreover, data show that the means of individual strategy items used by less proficient students ranged from a high of 4.55 to a low of 2.50. Some of the highly-used metacognitive strategies were also in the same subcategory of M4 Self-monitoring although with a slightly different ranking as less proficient students preferred “reread if do not understand” (item 10,  $M = 4.55$ ) to “read more slowly with difficult texts” (item 24,  $M = 4.14$ ). However, the least used strategy “set purpose before reading” had a similar ranking but with a higher mean of 2.50.

An analysis of the reading strategy questionnaire scores (pre-instruction) between the students in high-scoring and low-scoring levels indicates that there was a statistically significant difference found in the mean scores of item 22, “check if prior guess is correct” ( $p = 0.04$ ). The mean difference of 0.62 resulted from the low-group’s mean score of 3.27 (S.D. = 0.88) and the high-group’s mean score of 2.65 (S.D. = 1.06). This suggests that the students who were in the low grouping consciously checked their guess more often than those who were in the high grouping while reading.

The compared overall mean scores are further analysed using an independent-samples t-test. The results can be summed up in the following table:

**Table 4.28 Comparison of Mean Scores under Metacognitive Category Used by Both Groups**

Group	n	Mean	S.D.	t	Sig. (2-tailed)
High-scoring	26	3.31	0.49	0.59	0.56
Low-scoring	22	3.38	0.41		

Based on Table 4.28, the mean difference of metacognitive strategies between the two groups is .07. The t-test indicates there was no significant difference in reading strategy questionnaire scores between the students who were in high-scoring level ( $M = 3.31$ , S.D. = 0.49), and those who were in low-scoring level ( $M = 3.38$ , S.D. = 0.41). The  $t$ -value was found at 0.59 with a two-tailed  $p$  value of 0.56 indicating an insignificant value.



#### 4.1.2.2 Types and Frequencies of Cognitive Strategies Employed by High-and Low-Scoring Students

The average means scores of 18 statements in the category of cognitive strategies in the reading strategy questionnaire were analysed in relation to the test scores of the two groups of students. The results of t-tests are as follows:

**Table 4.29** Frequency of Cognitive Strategies Used by High-and Low-Scoring Students

Item no.	Strategy	High (n = 26)		Low (n = 22)		t	P
		M	S.D.	M	S.D.		
3	look up words in dictionary	3.92	0.85	3.91	0.92	-0.06	0.96
7	recognise author's opinion, tone & purpose	3.12	0.91	3.41	0.96	1.09	0.28
8	make use of experience to help understanding	4.38	0.85	4.05	0.84	-1.38	0.17
12	draw diagrams to represent key concepts	2.00	0.98	2.27	1.12	0.90	0.37
15	connect new information to old	4.04	0.87	3.36	0.95	-2.56	0.01*
18	guess words meanings by using contexts	3.88	0.71	3.59	0.91	-1.26	0.22
19	try to create image of what is being read	3.88	0.99	3.64	0.95	-0.88	0.38
25	write a summary of what has been read	2.27	0.78	2.59	1.01	1.25	0.22
26	use illustrations to understand content of text	3.85	1.01	3.82	0.91	-0.10	0.92
28	pronounce new words to help remember	3.04	1.34	3.18	1.01	0.41	0.68
30	make use of grammatical knowledge	3.42	1.14	2.55	0.86	-2.97	0.01*
33	apply similar techniques to when reading Thai	3.23	0.71	3.45	0.80	1.03	0.31
34	take notes when reading	2.54	0.76	2.86	0.83	1.41	0.17
35	use imagination to help understanding	4.08	0.98	3.95	0.65	-0.52	0.61
39	relate sound of new words to Thai	2.38	1.10	2.73	1.08	1.09	0.28
43	try to understand how things are grouped together	3.12	0.82	3.09	0.81	-0.10	0.92
44	translate what is being read into Thai	3.88	1.11	3.86	0.99	-0.07	0.95
45	make predictions about what is coming next	3.96	0.92	3.68	0.84	-1.10	0.28

\* The mean difference is significant at the 0.05 level.



With reference to Table 4.29, the means of individual strategy items for the High-scoring group ranged from a high of 4.38 to a low of 2.00. Some of the highly-used cognitive strategies were in the subcategories of C8 Elaboration and C6 Imagery. The three most highly-used strategies were “make use of experience to help understanding” (item 8,  $M = 4.38$ ) in C8 subcategory and “use imagination to help understanding” (item 35,  $M = 4.08$ ) in C6 Imagery, while item 15, “connect new information to old” ( $M = 4.04$ ) came in third place in the ranking. The least used strategy was found in the subcategory of C3 Note taking, “draw diagrams to represent key concepts” (item 12,  $M = 2.00$ ).

In the Low-scoring group, the means of individual cognitive strategies ranged from a high of 4.05 to a low of 2.27. Although items 8 and 35 were also used most frequently by less proficient students, their means scores were comparatively lower in comparison with the higher proficiency group by 0.33 and 0.13 respectively. The other highly-used strategy which was in the third ranking position among low-scoring group was “look up words in dictionary” (item 3,  $M = 3.91$ ) suggesting that the low-scoring students relied more on the use of references. The least used strategy was found to be in the same item of “draw diagrams to represent key concepts”. However, the lower proficiency group’s average score of 2.27 was found to be slightly higher than the higher proficiency group by .27.

The significant difference between the use of cognitive strategies among the proficient and less proficient students can be found in two items of, “connect new information to old” (item 15,  $p > 0.005$ ) and “make use of grammatical knowledge” (item 30,  $p > 0.005$ ). The mean differences of 0.68 and 0.87 in items 15 and 30 indicate that the students who were in the high-level proficiency tried to relate new information to existing knowledge and make use of grammatical knowledge of English to help them analyse difficult sentences more than the lows did when reading. After using an independent-samples t-test to compare the two sets of average means, the data can be presented as follows:

**Table 4.30 Comparison of Mean Scores under Cognitive Category Used by High- and Low-Scoring Students**

Group	n	Mean	S.D.	<i>t</i>	Sig. (2-tailed)
High- scoring	26	3.39	0.47		
Low-scoring	22	3.33	0.42	-0.43	0.67



Table 4.30 reveals the average scores for the students in the High-scoring level ( $M = 3.39$ ,  $S.D. 0.47$ ) and those in the low-scoring level ( $M = 3.33$ ,  $S.D. 0.42$ ). The  $t$ -value of  $-0.43$  and a  $p$  value of  $0.67$  suggest that there was no significant difference in the way both groups make use of cognitive strategies.

#### 4.1.2.3 Types and Frequencies of Social/Affective Strategies Employed by High- and Low- Scoring Students

The reading strategies in the social/affective category are based on 6 statements. The results of  $t$ -tests carried out to explore significant difference are presented in the following table:

**Table 4.31** Frequency of Social/Affective Strategies Used by High- and Low Scoring Students

Item no.	Strategy	High (n = 26)		Low (n = 22)		$t$	P
		M	S.D.	M	S.D.		
4	ask teacher for explanation	2.73	1.00	2.64	0.79	-0.36	0.72
6	alright not to understand everything	3.50	1.03	3.59	1.01	0.31	0.76
13	ask friends if do not understand	3.27	1.04	4.05	0.88	2.87	0.01*
23	read & exchange information in group	2.88	0.91	2.95	1.00	0.25	0.80
36	tell oneself text is not as difficult as it looks	2.88	1.11	3.00	1.02	0.37	0.71
40	encourage self to try harder	3.85	1.01	3.64	1.00	-0.72	0.48

\* The mean difference is significant at the 0.05 level.

The means of individual strategy items among the High-scoring users ranged from a high of 3.85 to a low of 2.73. Some of the highly-used cognitive strategies were from the subcategory of S/A3 Self-talk. The two most highly-used strategies were “encourage self to try harder” (item 40,  $M = 3.85$ ) and “alright not to understand everything” (item 6,  $M = 3.50$ ). The least used strategy was found in the subcategory of S/A1 Questioning for clarification, “ask teacher for explanation” (item 4,  $M = 2.73$ ).



As for the low-scoring group, the individual means of social/affective strategies ranged from a high of 4.05 to a low of 2.64. The most highly-used strategy was “ask friends if do not understand” (item 13,  $M = 4.05$ ), while item 40 “encourage self to try harder” came second in the ranking with the average score of 3.64 with the difference of 0.21 lower than the higher group. The least used strategy was found to be the same item “ask teacher for explanation” with a minor difference in the means of 0.09 suggesting that both groups did not usually ask teacher for help when having difficulties, but preferred to ask friends instead.

The significant difference between the use of social and affective strategies among the proficient and less proficient students can be found in, “ask friends if do not understand” (item 13,  $p = 0.01$ ). The mean score reported by the low-scoring group was 4.05, while the high-scoring group reported a lower mean score of 3.27. With the mean difference of 0.78, it can be suggested that the students who were in the low-level proficiency relied more on their friends for help when experiencing difficulties.

In order to find out if significant difference could be established, an independent-samples t-test has been used. Data can be presented as follows:

**Table 4.32 Comparison of Means Score in Social/Affective Category Used by High- and Low-Scoring Students**

<b>Group</b>	<b>n</b>	<b>Mean</b>	<b>S.D.</b>	<b>t</b>	<b>Sig. (2-tailed)</b>
High-scoring	26	3.19	0.55	0.85	0.40
Low-scoring	22	3.31	0.44		

The results from Table 4.32 show that there was no significant difference in the better questionnaire mean scores for the high-scoring group ( $M = 3.19$ ,  $S.D. = 0.55$ ), and the low-scoring group ( $M = 3.31$ ,  $S.D. = 0.44$ ). The  $t$ -value of 0.85 and a  $p$ -value of 0.40 indicate an insignificant result. However, the difference between the two sets of mean scores suggests that the low-scoring group make use of social/affective strategies more often than the high-scoring group.



### 4.1.3 The Difference in the Types and Frequencies of Reading Strategies Used over Time by the Experimental and the Control Groups

The issue to be investigated in this section is in response to the third research question which aims to explore if there is any difference in the types and frequencies of reading strategies used over time by the experimental and control groups. However, to validate the upcoming claims, there is a need to ascertain that the students in both groups were not significantly different from one another at the beginning of the term. In order to do so, two different sets of mean scores (pre- and post-instruction) were used and analysed through an independent samples t-test. Results of the pre-questionnaires between the two groups are as follows:

**Table 4.33 Comparison of Questionnaire Mean Scores between the Experimental and the Control Groups (Pre-Instruction)**

Group	n	Mean	S.D.	t	Sig. (2-tailed)
Experimental	30	3.37	0.40	0.25	0.80
Control	30	3.40	0.48		

According to Table 4.33, the descriptive statistics reveal that there was no significant difference in the mean scores between the experimental group ( $M = 3.37$ ,  $S.D. = 0.40$ ) and the control group ( $M = 3.40$ ,  $S.D. = 0.48$ ). The  $t$ -value was 0.25 and a Sig. two-tailed value of 0.80 indicating the reading strategies as found reported by both experimental and control groups were not different in terms of their frequencies.

After the students in both groups reported their strategy use, they received different types of instruction. The experimental group received reading strategy instruction, whereas a text-based approach was applied to the control group. The following two sections are based on comparing the results of the reading strategy questionnaire between the two groups before and after the instruction.

4.1.3.1 The Comparison of the Pre- and Post- Strategy Use in the Experimental Group

4.1.3.2 The Comparison of the Pre and Post Strategy Use in the Control Group



#### 4.1.3.1 The Comparison of the Pre- and Post- Strategy Use in the Experimental Group

After eight lessons based on a strategy-based approach which were taught throughout the whole course, the students in the experimental group were asked to complete the same reading strategy questionnaire at the end of the course. The results of their pre- and post-strategy questionnaire were analysed using a paired-samples t-test to compare before and after values which can be found in the next two tables.

**Table 4.34 Comparison of Questionnaire Mean Scores of the Experimental Group (Pre VS Post- Instruction)**

Time	n (Experimental Group)	Mean	S.D.	t	Sig. (2-tailed)
Before-instruction	30	3.37	0.40	-5.34	0.00
After-instruction	30	3.66	0.37		

**Table 4.35 Paired Samples Correlations of the Experimental Group (Pre VS Post- Instruction)**

	n (Experimental Group)	Correlation	Sig.
Before-After instruction	30	0.71	0.00

The descriptive statistics in Table 4.34 reveal that the mean number of questionnaire scores before the instruction of the experimental group is 3.37 with a standard deviation of 0.40, and after the instruction is 3.66 with a standard deviation of 0.37. The *t*-value of -5.34 and a two-tailed significance (*p*-value) of 0.00 was found suggesting the difference between means is significant at  $p < 0.001$ . Moreover, the data in Table 4.35 indicates a correlation between the two sets of mean scores ( $r = 0.71$ , significant at  $p < 0.001$ ). Therefore, it can be concluded that a statistically significant difference exists between the two groups in terms of the mean scores before- and after-instruction indicating that strategy training instruction has an effect on the increased mean score.



In order to pursue different ranges of reading strategies as used by the experimental group, the mean scores of 45 reading strategies used by the students before and after the reading strategy instruction were compared and analysed using a paired-samples t-test. The results are presented in the following table:

**Table 4.36 Differences in Reported Strategy by the Experimental Group (Pre VS Post- Instruction)**

Item no.	Strategy	Before (n = 30)		After (n = 30)		t	P
		M	S.D.	M	S.D.		
1	skim read the text	3.63	1.10	3.97	1.00	-2.16	0.04*
2	think about related vocabulary	2.87	1.04	3.23	0.94	-2.01	0.05*
3	look up words in dictionary	3.97	0.76	4.03	0.89	-0.37	0.71
4	ask teacher for explanation	2.90	0.80	3.10	0.66	-1.44	0.16
5	set purpose before reading	2.57	0.86	3.13	0.94	-2.81	0.01*
6	alright not to understand everything	3.60	1.00	3.80	0.76	-1.14	0.26
7	recognise author's opinion, tone & purpose	3.50	1.01	3.80	0.71	-1.51	0.14
8	make use of experience to help understanding	4.17	0.75	4.43	0.68	-1.61	0.12
9	underline or highlight important parts in text	3.97	0.93	4.20	1.03	-1.37	0.18
10	reread if do not understand	4.43	0.68	4.53	0.68	-0.83	0.41
11	evaluate if reading purpose is met	2.83	0.95	3.33	0.76	-2.63	0.01*
12	draw diagrams to represent key concepts	2.33	1.09	2.60	1.00	-1.31	0.20
13	ask friends if do not understand	3.80	0.66	3.73	0.83	0.57	0.57
14	read headings/sub-headings before reading text	3.83	1.09	4.53	0.73	-4.19	0.00*
15	connect new information to old	3.47	0.94	4.17	0.99	-3.63	0.00*
16	put a '?' in case of doubt	2.93	1.28	3.53	1.04	-2.34	0.03*
17	try to identify reading problems if do not comprehend	3.00	0.79	3.53	1.04	-2.64	0.01*
18	guess words meanings by using contexts	3.73	0.78	3.73	0.87	0.00	1.00
19	try to create image of what is being read	3.60	0.89	4.03	0.96	-2.44	0.02*
20	ask self if using effective reading strategies	3.00	0.91	3.10	0.66	-0.55	0.59



21	think about how text should be read	2.97	1.00	3.23	0.94	-1.28	0.21
22	check if prior guess is correct	3.33	0.88	3.47	0.94	-0.89	0.38
23	read & exchange information in group	3.10	0.88	3.67	0.99	-2.81	0.01*
24	read more slowly with difficult texts	4.10	0.80	4.27	0.74	-1.54	0.13
25	write a summary of what has been read	2.47	0.90	2.70	0.88	-1.23	0.23
26	use illustrations to understand content of text	3.83	0.99	4.17	0.79	-2.16	0.04*
27	preview text for its organization	3.40	0.89	3.57	0.77	-1.15	0.26
28	pronounce new words to help remember	3.07	1.11	3.07	1.11	0.00	1.00
29	ask self if understanding what is being read	3.77	0.90	3.90	0.80	-0.78	0.44
30	make use of grammatical knowledge	3.03	0.89	3.60	1.00	-3.32	0.00*
31	guess content from title	3.50	0.94	3.93	0.87	-2.04	0.05*
32	think about how well text is understood	3.70	0.79	3.97	0.85	-1.61	0.12
33	apply similar techniques to when reading Thai	3.50	0.73	3.40	0.81	0.62	0.54
34	take notes when reading	2.80	1.03	3.10	1.09	-1.39	0.17
35	use imagination to help understanding	3.80	0.81	3.93	1.01	-0.63	0.54
36	tell oneself text is not as difficult as it looks	2.90	0.99	3.20	0.71	-1.39	0.17
37	ignore unimportant details	2.87	0.86	3.27	0.98	-1.93	0.06
38	look for key words in a passage	3.73	0.83	3.80	0.89	-0.36	0.72
39	relate sound of new words to Thai	2.50	1.01	3.17	1.02	-3.16	0.00*
40	encourage self to try harder	3.43	1.10	4.17	0.87	-3.52	0.00*
41	scan for specific information	3.37	0.85	3.90	0.80	-2.90	0.01*
42	ask questions about text while reading	3.30	0.70	3.30	0.79	0.00	1.00
43	try to understand how things are grouped together	3.20	0.66	3.37	0.76	-0.93	0.36
44	translate what is being read into Thai	3.83	1.15	4.07	0.98	-1.42	0.17
45	make predictions about what is coming next	3.90	0.88	4.13	0.78	-1.19	0.24

\* The mean difference is significant at the 0.05 level.



According to Table 4.36, an analysis of the reading strategy questionnaire scores of pre- and post-instruction indicate that there was a difference between the two sets of mean scores. While the pre-questionnaire mean scores ranged from a high of 4.43 to a low of 2.33, the average scores of the post-questionnaire ranged from a high of 4.53 to a low of 2.60.

Regarding the mean scores, 40 out of 45 statements received higher mean scores in the post-questionnaire. However, based on descriptive statistics in Table 4.36, there were 16 strategies that were significantly different ( $p < 0.05$ ). The majority of the improved means were statements in the metacognitive category which included nine strategies of: “skim read the text” (item 1), “think about related vocabulary” (item 2), “set purpose before reading” (item 5), “evaluate if reading purpose is met” (item 11), “read headings/sub-headings before reading” (item 14), “put a ‘?’ in case of doubt” (item 16), “try to identify reading problems if do not comprehend” (item 17), “guess content from title” (item 31), and “scan for specific information” (item 41).

Five improved mean scores in the cognitive category at the significant level ( $p < 0.05$ ) included: “connecting new information to old” (item 15), “try to create image of what is being read” (item 19), “use illustrations to understand content of text” (item 26), “make use of grammatical knowledge” (item 30), and “relate sound of new words in Thai” (item 39).

As for the last social/affective category, two strategies of “read & exchange information in group” (item 23) and “encourage self to try harder” (item 40) received a significantly higher gain in mean scores.

Two strategies with decreased mean scores in the post-questionnaire were “ask friends if do not understand” (item 13) and “apply similar techniques to when reading Thai” (item 33) with a decrease of means by 0.10 in both. . The three strategies that remained unchanged were “guess words meanings by using contexts” (item 18,  $M = 3.73$ ), “ask questions about text while reading” (item 42,  $M = 3.30$ ), and “pronounce new words to help remember (item 28,  $M = 3.07$ ).



#### 4.1.3.2 The Comparison of the Pre- and Post- Strategy Use in the Control Group

The students in the control group were also asked to complete the same reading strategy questionnaire after an 8-lesson based on a text-based approach at the end of the course. The results of their pre- and post-strategy questionnaire were analysed using a paired-samples t-test to compare before and after values and are presented in Tables 4.34 and 4.35.

**Table 4.37 Comparison of Questionnaire Mean Score of the Control Group (Pre VS Post- Instruction)**

Time	n (Control Group)	Mean	S.D.	<i>t</i>	Sig. (2-tailed)
Before-instruction	30	3.40	0.48	-.79	.43
After-instruction	30	3.45	0.35		

**Table 4.38 Paired Samples Correlations of the Control Group (Pre VS Post- Instruction)**

	n (Control Group)	Correlation	Sig.
Before-After instruction	30	0.71	0.00

Table 4.37 reveals that the mean number of questionnaire scores before the instruction of the control group was 3.40 with a standard deviation of 0.48, while after the instruction, it was 3.45 with a standard deviation of 0.35. The t-value of -.79 and a two-tailed significance (p-value) of 0.43 were found indicating insignificant difference between the two sets of mean scores. This is in spite of the fact that the data in Table 4.38 indicates a correlation between the two sets of mean scores ( $r = 0.71$ , significant at  $p < 0.001$ ). What can be concluded is that there was no significant difference between the two groups in terms of the mean scores before- and after-instruction which indicates that text-based instruction has no effect on improving mean scores for those students who were in the control group.



Further analysis is also pursued to investigate if text-based instruction has brought a significant difference reflected in individual reading strategies as reported by the control group in their pre- and post-strategy questionnaire. To do so, the mean scores of 45 reading strategies used by the students before and after the reading strategy instruction were compared and analysed using a paired-samples t-test. The results are presented in the following table:

**Table 4.39 Differences in Reported Strategy by the Control Group (Pre VS Post- Instruction)**

Item no.	Strategy	Before (n = 30)		After (n = 30)		t	P
		M	S.D.	M	S.D.		
1	skim read the text	3.90	1.03	4.10	0.88	-1.18	0.25
2	think about related vocabulary	2.53	1.22	3.07	0.91	-2.64	0.01*
3	look up words in dictionary	4.00	0.95	3.80	1.10	1.00	0.33
4	ask teacher for explanation	2.60	1.00	2.50	0.82	0.49	0.63
5	set purpose before reading	2.43	0.90	2.50	0.82	-0.47	0.65
6	alright not to understand everything	3.47	1.07	3.67	0.66	-1.00	0.33
7	recognise author's opinion, tone & purpose	3.37	0.93	3.50	0.73	-0.64	0.53
8	make use of experience to help understanding	4.40	0.86	4.47	0.78	-0.44	0.66
9	underline or highlight important parts in text	3.83	0.99	3.83	0.91	0.00	1.00
10	reread if do not understand	4.60	0.62	4.27	0.69	2.57	0.02*
11	evaluate if reading purpose is met	2.63	0.89	2.90	0.71	-1.49	0.15
12	draw diagrams to represent key concepts	2.07	0.98	2.33	0.88	-1.28	0.21
13	ask friends if do not understand	3.50	1.17	3.77	1.07	-1.39	0.17
14	read headings/sub-headings before reading text	4.13	0.86	4.30	0.60	-1.04	0.31
15	connect new information to old	3.87	0.94	4.00	0.87	-0.63	0.54
16	put a '?' in case of doubt	2.57	1.33	3.00	1.11	-1.78	0.08
17	try to identify reading problems if do not comprehend	3.37	0.93	3.37	0.77	0.00	1.00
18	guess words meanings by using contexts	3.80	0.89	3.63	0.85	1.15	0.26
19	try to create image of what is being read	3.97	1.00	3.87	0.90	0.45	0.66



20	ask self if using effective reading strategies	2.83	1.26	2.97	0.67	-0.60	0.56
21	think about how text should be read	2.77	1.01	2.63	0.96	0.72	0.47
22	check if prior guess is correct	2.83	1.09	3.13	0.97	-1.47	0.15
23	read & exchange information in group	2.87	1.04	2.77	0.68	0.52	0.61
24	read more slowly with difficult texts	4.50	0.73	4.37	0.72	0.89	0.38
25	write a summary of what has been read	2.57	0.94	2.47	0.82	0.46	0.65
26	use illustrations to understand content of text	3.90	1.03	4.17	0.95	-1.49	0.15
27	preview text for its organization	3.27	0.91	3.57	0.82	-1.61	0.12
28	pronounce new words to help remember	3.10	1.12	3.20	1.13	-0.50	0.62
29	ask self if understanding what is being read	3.90	1.03	3.87	0.82	0.15	0.88
30	make use of grammatical knowledge	3.20	1.32	3.43	0.97	-1.23	0.23
31	guess content from title	3.70	1.02	3.60	1.00	0.72	0.48
32	think about how well text is understood	3.80	1.13	3.57	0.73	1.19	0.24
33	apply similar techniques to when reading Thai	3.20	0.71	3.50	1.04	-1.36	0.18
34	take notes when reading	2.80	0.71	2.60	0.97	1.03	0.31
35	use imagination to help understanding	4.23	0.86	4.23	0.68	0.00	1.00
36	tell oneself text is not as difficult as it looks	3.20	1.24	3.23	0.73	-0.14	0.89
37	ignore unimportant details	2.70	0.75	3.10	0.99	-2.56	0.02*
38	look for key words in a passage	4.13	0.82	3.77	0.94	2.36	0.03*
39	relate sound of new words to Thai	2.80	1.24	2.67	1.18	0.64	0.53
40	encourage self to try harder	4.07	0.91	3.73	1.01	2.57	0.02*
41	scan for specific information	3.60	0.86	3.87	0.90	-1.39	0.17
42	ask questions about text while reading	2.93	0.98	2.93	0.69	0.00	1.00
43	try to understand how things are grouped together	3.13	0.94	3.13	0.82	0.00	1.00
44	translate what is being read into Thai	3.97	1.00	3.87	1.14	0.53	0.60
45	make predictions about what is coming next	3.80	0.92	3.83	0.87	-0.21	0.84

\* The mean difference is significant at the 0.05 level.



The pre-questionnaire mean scores of the students in the control group ranged from a high of 4.60 to a low of 2.07, while the average scores of the post-questionnaire ranged from a high of 4.47 to a low of 2.33. An analysis of the pre- and post-strategy questionnaire mean scores indicates that there were some changes in some pairs of mean scores in both a positive and negative way. Statistically, the means of 5 strategies in the post- strategy questionnaire were significantly different ( $p<0.05$ ) regarding their pre- and post- mean scores.

In total, there were 23 strategies with higher mean scores. However, only two received significantly higher gains in the compared means which were “think about related vocabulary” (item 2) and “ignore unimportant details” (item 37). Some of the other reading strategies with higher mean scores were “preview text for its organisation” (item 27), “apply similar techniques to when reading Thai” (item 33), and “scan for specific information” (item 41) although none of them was statistically different regarding their compared mean scores.

With reference to items with decreased mean scores, 17 out of 45 statements received lower mean scores in the post-questionnaire. However, there were 3 strategies with significant difference which included “reread if do not understand” (item 10), “look for key words in a passage” (item 38), and “encourage self to try harder” (item 40). The score differences were 0.33, 0.37 and 0.33 respectively. Without gaining statistical significance, some of the other strategies with lower mean scores also included, “look up words in dictionary” (item 3), “think about how text should be read” (item 21), “write a summary of what has been read” (item 25), and “think about how well text is understood” (item 32).

The 5 items with no change in their mean scores included “underline or highlight important parts in text” (item 9), “try to identify reading problems if do not comprehend” (item 17), “use imagination to help understanding” (item 35), “ask questions about text while reading” (item 42) and “try to understand how things are grouped together (item 43).



## 4.2 The Results of the Reading Comprehension Test

The discussion in this section is based on the results of the reading comprehension tests conducted at the beginning and at the end of the course. Basically, it aims to answer research questions 4, 5, and 6. However, in order to make sure that the students' reading proficiency between the two groups was not statistically different at the onset of the course, the students in both groups were asked to do the test on the first day of the course. Details of the test scores are as follows:

**Table 4.40 Descriptive Statistics of Pre-Test Scores**

Test	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	60	6	23	13.93	3.50

As can be seen from Table 4.40, out of the total of 60, the students' scores range between the highest of 23 to the lowest of 6. The average mean score is 13.93 with the standard deviation of 3.50. A further step was taken to find out if the pre-test scores between the control and experimental groups were significantly different by using an independent samples t-test. Results of the t-test are as follows:

**Table 4.41 Comparison of Pre-Test Scores between the Control Group and the Experimental Group**

Group	n	Mean	S.D.	<i>t</i>	Sig. (2-tailed)
Experimental	30	13.57	3.24	-0.81	0.42
Control	30	14.30	3.76		

According to Table 4.41, the mean score of the experimental group was 13.57 (S.D. = 3.24), while for the 30 students in the control group the mean score was 14.30 (S.D. = 3.76). The difference between the means for the two groups was 0.73. The t-value of the mean difference was -0.81 and the Sig. (2-tailed) was found to be 0.42. Therefore, it can be concluded that the reading proficiency level of both groups was not statistically different at the beginning of the instruction.



In response to the research questions 4, 5, and 6, data are presented in the following sections respectively.

4.2.1 Comparison of Pre-Test and Post-Test Scores of the Experimental Group

4.2.2 Comparison of Pre-Test and Post-Test Scores of the Control Group

4.2.3 Comparative Rate of Success between the Students at their Different Levels of Proficiency in Both Groups (Post-Instruction)

#### 4.2.1 Comparison of Pre-Test and Post-Test Scores of the Experimental Group

After the students in the experimental group took the test, they went on to have 8 weeks of reading lessons with the integration of reading strategy instruction and did the same test again at the end of the course. In response to research question 4, the students' pre-and post-test reading scores are compared and analysed using a paired-samples t-test which yields the following results:

**Table 4.42 Comparison of Pre-Test and Post-Test Scores of the Experimental Group**

Time	n (Experimental Group)	Mean	S.D.	<i>t</i>	Sig. (2-tailed)
Before-instruction	30	13.57	3.24	-5.18	0.00
After-instruction	30	16.03	3.88		

**Table 4.43 Paired Samples Correlations of the Experimental Group (Pre VS Post- Instruction)**

	n (Experimental Group)	Correlation	Sig.
Pre-post test score	30	0.75	0.00

Based on Table 4.42, the mean score of the pre-test was 13.57 (S.D. = 3.24), while the post-test score was 16.03 (S.D. = 3.88) which resulted in the mean difference of 0.64. The t-value of -5.18 with the Sig. (2-tailed) of 0.00 indicated a significant mean difference between the two sets of test scores.



As found in Table 4.43, the relationship between the two sets of scores was found to be 0.75 and significant at the level of  $p < 0.001$ . Therefore, it can be concluded that the students in the experimental group have made improvement in their reading proficiency and benefited from strategy training instruction.

#### 4.2.2 Comparison of Pre-Test and Post-Test Scores of the Control Group

Similar procedures were carried out with the control group after 8 weeks of text-based instruction. The students in the control group were asked to do the same test again. In answering research question 5, their pre-and post-test scores were then compared and analysed using a t-test.

**Table 4.45 Comparison of Pre-Test and Post-Test Scores of the Control Group**

Time	(Control Group)	Mean	S.D.	<i>t</i>	Sig. (2-tailed)
Before-instruction	30	14.30	3.76	-4.04	0.00
After-instruction	30	16.83	3.39		

**Table 4.46 Paired Samples Correlations of the Experimental Group (Pre V Post- Instruction)**

	n (Control Group)	Correlation	Sig.
Pre-post-test score	30	0.54	0.02

According to Table 4.45, the mean score of the pre-test was 14.30 (S.D. = 3.76), while the post-test score was 16.83 (S.D. = 3.39) which resulted in a mean difference of 2.53. The *t*-value is 0.54 with the Sig. (2-tailed) of 0.00 indicating significant mean difference between pre- and post-test scores. The relationship of 0.54 between the two sets of scores is found to be significant at 0.02. Therefore, it can be concluded that the students in the control group have also made great improvement in their reading proficiency and benefited from text-based instruction.



### 4.2.3 The Rate of Success at Different Levels of Students' Proficiency in Both Groups (Post-Instruction)

The discussion in this last section is in response to research question 6 which aims to find out whether there is a significant difference between the different levels of the students in both groups after having been taught using different approaches. In order to do so, the students (N = 60) have been divided into three approximately equal groups of low, medium, and high level students so that their average scores can be compared to explore whether their compared test scores are significantly different at the end of the course. Details of the distribution of scores are presented in the following table:

**Table 4.47 Distribution of Post-Test Scores at Three Levels of Proficiency**

<b>Level of proficiency</b>	<b>Range of scores</b>	<b>Frequency</b>	<b>Percent</b>
Low	below 15	24	40.00
Moderate	16-18	19	31.70
High	above 19	17	28.30
<b>Total</b>		<b>60</b>	<b>100.00</b>

After the cut-off points have been established, a one-way between-group analysis of variance (ANOVA) is conducted to examine the impact of different teaching instructions on three levels of proficiency (high, medium, and low) in relation to the particular group they belong to, experimental or control. The presentation is in the following order.

4.2.3.1 The Discussion of the Students' Scores in Relation to Levels of their Proficiency: Experimental Group

4.2.3.2 The Discussion of the Students' Scores in Relation to Levels of their Proficiency: Control Group



### 4.2.3.1 The Discussion of the Students' Scores in Relation to Levels of their Proficiency: Experimental Group

Details of the students' mean scores at each level can be summed up as follows:

**Table 4.48 Data of the Students' Mean Scores: Experimental Group**

Level of proficiency	(Experimental group) n	Mean	S.D.	F	Sig. (2-tailed)
Low	15	13.00	2.27	36.13	0.00
Medium	8	17.50	0.76		
High	7	20.86	2.67		
<b>Total</b>	<b>30</b>	<b>16.03</b>	<b>3.88</b>		

With reference to Table 4.48, the low students scored a mean of 13.00 (S.D. = 2.27), the medium students scored a mean of 17.50 (S.D. = 0.76), and the high students scored a mean of 20.86 (S.D. = 2.67). The value of F was 36.13 and the difference between the means was significant at the level of  $p < 0.001$ . Therefore, it can be assumed that there is a significant overall difference between the different groups of students at their different levels of proficiency. To pursue how the groups differ, follow up Tukey HSD tests were conducted and the data are presented in the following table:

**Table 4.49 One-Way Anova Comparisons of the Students' Mean Scores: Experimental Group**

Level of proficiency		Mean Difference	Std. Error	Sig.
Low	Medium	-4.50*	0.92	0.00
	High	-7.86*	0.96	0.00
Medium	Low	4.50*	0.92	0.00
	High	-3.36*	1.09	0.01
High	Low	7.86*	0.96	0.00
	Medium	3.36*	1.09	0.01

\* The mean difference is significant at the 0.05 level.



In order to interpret these statistics, it is assumed that any figure in the Sig. Column less than .05 is deemed significant. Based on Table 4.49, the significance values between each pair suggest that each level was significantly different from the other at the  $p < .05$  level. As higher mean scores in the post-reading test indicate some improvement in the level of proficiency, it can be concluded that the students in the experimental group improved significantly at all levels at the end of their reading strategy instruction.

#### 4.2.3.2 The Discussion of the Students' Scores in Relation to Levels of their Proficiency: Control Group

Details of the students' mean scores at each level can be summed up as follows:

**Table 4.50 Data of the Students' Mean Scores: Control Group**

Level of proficiency	(Control group) n	Mean	S.D.	F	Sig. (2-tailed)
Low	9	12.67	1.73	76.01	0.00
Medium	11	17.00	1.00		
High	10	20.40	1.35		
<b>Total</b>	<b>30</b>	<b>16.83</b>	<b>3.40</b>		

As can be seen from Table 4.50, the low students scored a mean of 12.67 (S.D. = 1.73), the medium students scored a mean of 17.00 (S.D. = 1.00), and the high students scored a mean of 20.40 (S.D. = 1.35). The value of F was 76.01 and the difference between the means was significant at the level of  $p < 0.001$ . Therefore, a significant overall difference between different groups of students at their different levels of proficiency can be assumed. Tukey HSD tests were conducted to find out how the groups differed. The results are presented in Table 4.51.



**Table 4.51 One-Way Anova Comparisons on the Students' Mean Scores: Control Group**

Level of proficiency		Mean Difference	Std. Error	Sig.
Low	Medium	-4.33*	0.61	0.00
	High	-7.73*	0.63	0.00
Medium	Low	4.33*	0.61	0.00
	High	-3.40*	0.60	0.00
High	Low	7.73*	0.63	0.00
	Medium	3.40*	0.60	0.00

\* The mean difference is significant at the 0.05 level.

According to Table 4.51, all of the figures in the Sig. Column were less than .05 which indicated significant difference between the three groups at all levels of proficiency. Therefore, taken all together these findings show that the students in the low-level, medium-level and high-level groups all significantly benefitted from text-based strategy instruction.

### 4.3 Summary of the Findings

This chapter is in an attempt to answer research questions 1-6 based on the two major research tools used in the main study which include a strategy questionnaire and a reading comprehension test. In order to sum up the main findings which have been previously discussed in the chapter, all research questions will be restated and answered accordingly. Research questions 1, 2 and 3 are based on the results from the strategy questionnaire, while research questions 4, 5, and 6 are based on the results from the reading comprehension test.

In order to answer research question 1, "What are the reading strategies the students in the experimental and control groups use when reading English texts?", the overall mean scores regarding types and frequencies of reading strategies used by the students in both groups at their pre-instruction stage were analysed, ranked, and discussed in relation to the corresponding categories they belong to in metacognitive, cognitive and social/affective strategies.



The overall mean scores reveal that the students in the current study used cognitive strategies most frequently with the average mean score of 3.41, while the use of metacognitive strategies was found slightly lower at the average mean of 3.38. The category of social/affective strategies was found least used with the total mean score of 3.29.

Further analysis into ranked reading strategies under cognitive mean scores shows that the students showed preference in making use of their experience as well as imagination to help them understand what they read. They also relied on referencing sources, such as dictionaries, when having difficulties with vocabulary. They did not make much use of note-taking nor making summaries while reading. In the metacognitive category, their mean scores show that the students consciously monitored their comprehension while reading. However, they did not pay much attention to evaluating their understanding when they finished reading. Regarding the social/affective subcategory, the students were highly motivated to read and sought help from peers when needed. However, they did not show preference for working in groups.

In order to answer research question 2 which asks, “Is there any relationship between the students’ level of reading proficiency and the types and frequencies of reading strategies reported?”, independent-samples t-tests were conducted to compare the students’ mean scores between two different groups by analysing them in relation to individual strategies corresponding to metacognitive, cognitive and social/affective categories. The conduct of t-tests in both experimental and control groups found no significant difference in the way how high-scoring and low-scoring students used reading strategies when reading English texts.

As for research question 3 which is posed as, “What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?”, paired-samples t-tests were conducted to compare the students’ pre- and post- questionnaire mean scores. Based on the results of t-tests, the students in both groups did not differ statistically at the beginning of the course.



However, the t-tests conducted with their post-mean scores show different results between the two groups. That is, while the compared mean scores of the students in the experimental group showed an improvement score by 0.29 ( $p$ -value at 0.00), no significant difference was found in the control group as there was an increase in the compared mean scores only by .05 resulting in an insignificant  $p$ -value of .43. It can be stated that strategy training has a direct effect on students' higher use of reading strategies.

Research questions 4 and 5 consist of two following questions, "Does strategy training help the students in the experimental group to improve their reading proficiency significantly?" and "Do the students in the control group benefit from the usual approach to teaching reading in improving their reading proficiency?". In attempt to answer if both types of instructions applied to different groups of students make a difference in the students' scores in both groups at the end of their training, data based on the results of the reading comprehension test were used. The conduct of paired-samples t-tests as presented in Table 4.42 and 4.44 indicated that both groups made a significant improvement in their post-test scores compared to pre-tests scores. Both sets of mean difference increased by 2.64 and 2.53 in the experimental and the control groups respectively. The high rate of improved mean scores in both groups indicates that both types of reading instruction, strategy training and text-based have a positive effect in improving the students' scores in both groups at the end of the course.

A one-way between-group analysis of variance (ANOVA) was conducted to answer the last research question, "To what extent do the students at different levels in both groups benefit from the two different teaching approaches?". This is to explore the impact of the two different methods of teaching reading on students' proficiency at different levels. The students were divided into three groups (high, medium, and low) according to the range of their reading scores. Data revealed that there was a statistically significant difference at the  $p < .05$  level in mean reading scores between and within groups. After Tukey HSD tests were conducted, the mean scores were found to be significantly different at all levels of the proficiency levels in both experimental and control groups.



#### 4.4 Conclusion

Based on the two research tools of the questionnaire and the test, different sets of quantitative data have been analysed and discussed in great details in an attempt to answer research questions 1-6 as clearly and concisely as possible through the use of different types of statistical packages including *t*-tests and ANOVA. The discussion in the next chapter aims to answer research questions 1, 2, and 3 again but data is investigated in different perspectives through different sets of two qualitative data based on think-aloud verbal reports and a reading log.



## **Chapter 5**

### **Findings of Qualitative Data**

Data on quantitative aspects of the research have been discussed in Chapter 4 based on the strategy reading questionnaire and the reading comprehension test. This chapter presents qualitative findings of the think-aloud protocols as well as reading log studies. It is organised in terms of the specific research questions 1, 2 and 3. The research questions are as follows:

1. What are the reading strategies the students in the experimental and the control groups use when reading English texts?
2. Is there any relationship between the students' level of reading proficiency and the types and frequencies of reading strategies reported?
3. What is the difference in the types and frequencies of reading strategies used over time between the experimental and the control groups?

In order to answer the questions posed above, this chapter first reports on how the main think-aloud sessions were carried out, and how data were collected and analysed in Sections 5.1.1, 5.1.2 and 5.1.3 respectively. It then presents the results of the think-aloud study in Section 5.1.4, while the study of reading logs is discussed and its findings are presented in the same manner as the think-aloud study in Section 5.2.

#### **5.1 The Main Think-Aloud Verbal Study**

In order to investigate the reading strategies employed by the students in the study, two types of research tools, a reading strategy questionnaire and think-aloud were used. The results of findings from the questionnaire were discussed in Chapter 4. The use of a questionnaire was an appropriate research tool due to the fact that there were a large group of students who took part in the study. However, as reading is a cognitive process, it can also be investigated more directly through thinking-aloud verbal reports as well as written accounts reflected through reading logs.

In the main study, think-aloud was carried out with a smaller number of students who represented both experimental and control groups and were at different



levels of reading proficiency, high and low. The data gained from think-aloud protocols enabled the researcher to explore in depth the way the students in both groups used strategies when reading texts in relation to the group they belong to; whether experimental or control, as well as their reading proficiency; whether good or poor.

Details involved in the main think-aloud study are discussed in the following order. The information related to the main think-aloud procedure is discussed in Section 5.1.1 which includes the characteristics of the participants, the characteristics of the texts, choice of language used, think-aloud instruction and the types of interventions as found in the main study. Section 5.1.2 provides information on coding procedure consisting of matching sentences and protocols, identifying and categorising strategies, and setting up coding systems. The analysis procedure is discussed in Section 5.1.3 which includes the categorisation and definition of strategies and the reliability of coding.

The results of the think-aloud study are presented in Section 5.1.4 in response to the research questions 1, 2 and 3 posed at the beginning of this chapter. It first presents the reading strategies employed by students in the study. It then compares the reading strategies used between students who have higher and lower proficiency levels. Finally, comparison is made between the students in both groups in terms of the type and frequency of strategies employed before and after the instruction periods.

### **5.1.1 The Main Think-Aloud Procedure**

The discussion is in five sections, each of which presents different aspects of information regarding characteristics of the participants, characteristics of the texts, choice of language, think-aloud instruction and types of interventions.

#### **5.1.1.1 Characteristics of the Participants**

As mentioned in chapter 3, there were 60 participants who took part in the main study. They were all first year students enrolling in the English Foundation Course II. Randomly assigned, they consisted of two groups of equal numbers and were referred to as the experimental and the control groups.



In the main study, think-aloud reports were collected from 8 students with equal number of males and females. Four students from each group participated in the study. In general, the participants were all between 18 and 19 years old and had been studying English for 8 to 13 years. The main criterion in selection was based on the reading comprehension test scores from the tests they took on the first day when the course started. Details of the participants are as follows:

**Table 5.1 Participants' Information in the Main Think-Aloud Study**

<b>Group</b>	<b>No.</b>	<b>Sex</b>	<b>Faculty</b>	<b>Reading scores (30)</b>	<b>Level of proficiency</b>
Experimental	1	Female	Accounting	19	High
	2	Male	Accounting	17	High
	3	Female	Science & Technology	8	Low
	4	Male	Science & Technology	10	Low
Control	5	Female	Science & Technology	22	High
	6	Male	Science & Technology	20	High
	7	Female	Allied Health Science	6	Low
	8	Male	Science & Technology	10	Low

Based on the reading scores, two types of readers were established, high and low. As can be seen from Table 5.1, four students whose scores ranged from 19-22 were selected and classified as proficient readers (high), while less proficient readers (low) were among those who scored between 6-10 on their reading comprehension test. The selection of the participants in this way enabled the researcher to manipulate data gained from the think-aloud reports from two different perspectives. While it was possible to investigate the reading strategies employed by the students who had different reading abilities (high and low), the researcher was able to compare the reading strategies employed based on the particular group the students belonged to (experimental or control).

The students met with the researcher twice to perform their think-aloud reports on two occasions which was before and after the instruction periods. The researcher informed all the eight participants that the think-aloud sessions were conducted as part of the study carried out by the researcher and were not involved with any form of assessment. As the think-aloud sessions were conducted by the researcher who was also their lecturer, the participants did not find the conduct of think-aloud threatening and they were relaxed and fully cooperative.



### 5.1.1.2 Characteristics of the Texts

With reference to Table 3.8, the two texts with their titles, “Did You Know We Live in a Greenhouse?” and “Bali Travel Information” were selected to be used in the main study. Details of the criteria of the text selection were discussed in Section 3.2.2.4.2. Both texts as originally used in the main study can be found in Appendix D. Details of the two texts are presented as follows:

**Table 5.2 Information of the Think-Aloud Texts**

Title	No. of words.	No. of sentences	Used in
“Did You Know We Live in a Greenhouse?”	489	37	Pre-instruction
“Bali Travel Information”	483	33	Post-instruction

Both texts were self-contained selections and were written for general readers. The level of difficulty is similar to what the students find in the reading passages in their English Foundation text book. The topics of the two texts, global warming and travel, are generally well-known and should not, therefore, create any problems regarding background knowledge among the students who read them. The main content of the two passages can be summarised as follows:

The first text on “Did You Know We Live in a Greenhouse?” begins by drawing similarities between what a greenhouse does for plants to what the atmosphere does for the Earth in keeping it warm. It then discusses how some of man’s activities, i.e., excessive use of fossil fuels and deforestation, have thrown nature out of balance and caused global warming. Finally, it suggests some solutions which readers can engage in to help.

The second text which is entitled, “Bali Travel Information”, provides general information on Bali using several topics. The passage first begins by telling readers a mythical legend of Bali. It then provides some geographical features of Bali as one of those thousand islands forming part of Indonesia. The text then goes on to discuss different modes of transportation on the island the tourists can choose from including local *bemos* or a *dokar* which can be referred to from the text as, ‘a public car’ and ‘a carriage’ respectively.



The researcher keeps them in their original form as they are triggered as unknown words in the context and encouraged the students to employ strategies in order to guess their probable meanings in the text.

### 5.1.1.3 Choice of Language

There seems to be no absolute agreement for L2 readers in which language they should be asked to report. In Nyhus's (1994) and Upton's (1993) studies (as cited by Cohen, 1998, pp. 54-55), the reports show conflicting choices between the choice the participants made between L1 and L2. While more proficient readers prefer to report in English, the less proficient ones react negatively and choose to give a report in their first language.

In both pilot and main think-aloud studies, the think-aloud reports were carried out in Thai. There are two major reasons the researcher chose to do this. Firstly, all of the participants share the same first language, which is Thai. As mentioned in Chapter 1, English is taught as a foreign language and has limited use in daily-routine communication, so the students are likely to be less fluent in verbalising in other languages than Thai. McDonough (1995, p. 11) views the use of another language rather than the native one as creating an 'additional complication' to the way participants give reports. Secondly, one of the questions the researcher is investigating is into different strategies employed between more and less proficient students; by asking both groups of the students to verbalise in English might have put the weaker students at a disadvantage due to the language barrier. As Cohen (1998, p. 54) puts it, "...performing the verbal report in English was most likely to the detriment of those with poorer English skills."

To avoid the possibility of threats to the reliability of data, the researcher, therefore, asked the students to report in their L1. This is in line with Devine (1987), McDonough (1995) and McDonough and McDonough (1997) who suggest that language learners should be allowed to talk to the language they are most comfortable with. By asking them to do this in L2 might create a second language threshold and the verbal reports may not reflect their cognitive processes (Kormos, 1998) resulting in having inadequate data.



#### 5.1.1.4 Think-Aloud Instruction

As discussed earlier in the methodology chapter, instruction and warm-up activities have a vital role to play as they help the participants to familiarise with the processes of talking and performing the task at the same time, the researcher followed the six stages of instructions proposed in the same section. To recap, they include: introduction, warm-up, instruction, pre-think aloud, think-aloud and post think-aloud.

Each of the eight participants gave two verbal reports, before- and after-instructional periods. The first think-aloud took place in the first week of November 2004 which was at the beginning of the course. The researcher made an appointment to see each student individually. The think-aloud sessions were carried out in the researcher's office. Although it was the first time for all of the students, they were able to grasp what they were required to do, and the think-aloud reports went well.

The second think-aloud took place in February 2005. The researcher made an appointment to see all of the eight participants individually again before the end of the course. The researcher repeated the same set of instructions to refresh their memories, while a new set of activities in the warm-up and pre-think-aloud stages were introduced so as not to repeat what they had previously done. Some of the changes made included, a new set of letter puzzles as well as a news excerpt to be used in the pre-think-aloud session to avoid repetition.

Dictionaries were allowed in the main study although some of the studies (i.e., Gerloff, 1987) make a point that their absence would encourage learners to use more reading strategies. However, based on the researcher's experience, weak students tend to rely heavily on their use, so without the dictionary they might find it hard to proceed when coming across difficult words. By allowing them to use the dictionary when they need also helps to reflect the students' natural reading process as closely as possible. According to O'Malley and Chamot (1990, p. 198), resourcing is described as one of the cognitive strategies which involves, "using reference materials such as dictionaries, encyclopedias, or textbooks". Therefore, the use of a dictionary is considered as a strategy of the learner's own choice.



In the think-aloud study, the researcher provided both monolingual and bilingual dictionaries, while making it clear to the students that they were allowed to use a dictionary when they needed to.

### **5.1.1.5 Types of Interventions**

The basic concept of concurrent think-aloud reports is to let the participants verbalise their thoughts freely while they are performing the task. While the think-aloud activities were going on, there were times where the students were interrupted by the researcher on different occasions. All of the interventions were spontaneous and were kept to a minimal level.

Having finished transcribing the think-aloud verbalisations, and having taken note of the interventions made, the researcher found out that there were four main occasions on which interventions were used in the main study, namely, correcting the information as read by the students, asking for clarification, asking for confirmation and encouraging the students to continue thinking aloud. Each type of intervention will be discussed in the following sections in relation to when it occurred, what the researcher did, and why it was necessary to take action at that particular time. The whole discussion will be based on the verbal protocols found in the text, “Did You Know We Live in a Greenhouse?” in which most of the interventions occurred.

#### **5.1.1.5.1 Correcting the Information**

In the main study, there were times when students skipped certain parts of the text and the researcher intervened. For example, 5 out of 8 students skipped the minus symbol (-) as they were reading the text resulting in their misunderstanding the word, “-18°C” as “18°C” when thinking aloud. A sample of how the information is corrected can be found in Table 5.3.



**Table 5.3 A Sample Protocol of How the Information is Corrected**

<b>Text</b>	<b>Student's protocol</b>	<b>Researcher's intervention</b>	<b>Student's response</b>
Without the natural greenhouse effect, the temperature would be - 18° C.	Just like here it says, 15°C and 18 °C. It seems ...	It's minus 18 °C.	Oh, minus 18 °C. Now I understand. That's why it didn't seem to make sense at first.

This symbol is crucial in the process of interpreting and forming the overall meaning derived from the text. By misreading, it would have affected the way the students perceived the text resulting in not being able to fully comprehend the text.

#### **5.1.1.5.2 Asking for Clarification**

While thinking aloud, the students sometimes made remarks or comments in response to the text they were reading, but they did not make their points clear. When this type of incident happened during the think-aloud, the researcher felt it was necessary to ask them for clarification and then moved on. A sample of a student's protocol of asking for clarification is as follows:

**Table 5.4 A Sample Protocol of Asking for Clarification**

<b>Text</b>	<b>Student's protocol</b>	<b>Researcher's intervention</b>	<b>Student's response</b>
We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things.	Why do they have to call it by such a name?	Which name, please?	The greenhouse effect." In fact, it's in the atmosphere. Something we can't even see.

According to the nature of the concurrent report, what the student was verbalising came from his short-term memory, so it was possible for him to retrieve and reply instantly. This kind of answer provided by the student at that time would more closely and accurately reflect his thoughts rather than waiting and asking him later after the think-aloud was over.



### 5.1.1.5.3 Asking for Confirmation

While thinking aloud, some students may have skipped some sentences unintentionally. However, as applied in this study, think-aloud verbal data were collected at the end of every sentence after a square (□), missing any of them would have resulted in having incomplete data. Therefore, the researcher had to follow and monitor carefully where a student was up to as can be seen in the following table.

**Table 5.5 A Sample Protocol of Asking for Confirmation**

<b>Text</b>	<b>Student's protocol</b>	<b>Researcher's intervention</b>	<b>Student's response</b>
Some of our energy sources, known as fossil fuels, have been trapped beneath the ground for millions of years: coal, oil, and natural gas.	Some of our energy sources, ...	Excuse me, have you thought aloud the previous sentence yet?	Don't think so. So, it says, "Did you know?"...

### 5.1.1.5.4 Encouraging to Continue Thinking Aloud

Most students tended to become silent especially when they came across problems as they were reading. In most cases, they would take time to think to themselves while forgetting to think aloud as can be supported by the following example.

**Table 5.6 A Sample Protocol of Encouraging to Continue Thinking Aloud**

<b>Text</b>	<b>Student's protocol</b>	<b>Researcher's intervention</b>	<b>Student's response</b>
Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	.... Silence...	Please keep talking.	There's a word here I don't know the meaning. It's the word, "trap".



As mentioned earlier because reading is a silent process, it is impossible to know what is going in a reader's mind unless it is verbalised. By encouraging the students to keep talking after they were silent for a while helps the researcher to find out more about what type of reading difficulties they were experiencing or how they went on to solve the problems.

To sum up, as mentioned earlier that the participants should be given opportunities to take an active role while reporting their thoughts, this is in line with what Smagorinsky (1994) points out that the researcher's role while think-aloud is carried out should be neutral and avoid cueing particular responses. The researcher should be present to remind participants to keep talking.

However, the researcher feels that interruptions during the think-alouds are sometimes unavoidable and can vary from student to student. As mentioned earlier the interruptions made by the researcher were unplanned and spontaneous to what was happening in the think-aloud. In certain circumstances, interventions can be found to be necessary in retrieving more information which otherwise might be lost during the process of reporting. However, all interruptions (if any) should not be intrusive and as brief as possible. After receiving clarified from the participants, researchers should let them get back to their reading process as soon as possible. Being interrupted too frequently may cause interference with their ongoing reading process resulting in inaccurate data.

## **5.1.2 Coding procedure**

The coding procedure includes three main stages: matching sentences and protocols, identifying and categorising strategies, and setting up coding systems. Each stage will be described in detail in the following sections.

### **5.1.2.1 Matching Sentences and Protocols**

After the students' recorded verbalisations were transcribed, their verbal protocols were then matched with the corresponding sentences in the text. For example, based on the text, "Bali Travel Information", a matched pair of sentence and a student's protocols look like the following:



**Table 5.7 A Sample Analysis on a Matched Pair of Sentence and Protocols**

Text	Student's protocols
It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	I don't understand what the words, 'fertile' and 'shore' mean. I'll read again. So, it was a beautiful island... I think I'll just skip this sentence.

### 5.1.2.2 Identifying and Categorising Strategies

Each protocol was analysed to infer what type of operations the particular student performed at points in time. The analysis was based on students' explicit protocols, and no inference was made on the part of the researcher.

When the student responded to the text by saying, "I don't understand what the words, 'fertile' and 'shore' mean.", his protocol was categorised as "self-monitoring" because it represents a way of how the reader consciously checks his comprehension while reading. However, as the category of "self-monitoring" can include a wider range of strategies of what a reader can do while reading, a descriptive name or a label was given as, "identify the source of reading problem". This helps to differentiate it from other strategies that may fall in the same category when employed by the same or other readers.

As can be seen from the next protocol given by the same student when he said, "I'll read again. So, it was a beautiful island..." his protocol was classified as "self-monitoring" again as he was aware that he did not comprehend the text, and he wanted to reread again for better understanding. This strategy was described as "reread".

In the student's last protocol in response to the particular text, he said, "I think I'll just skip this sentence," was categorised as "selective attention" as it represents the way of how readers pay attention to key words and at same time they can ignore inessential or unknown words and move on to the next sentence which was what the particular student did. Therefore, the reading strategy was described as "skip to the next sentence".

After the corresponding category was assigned, followed by a descriptive name to suggest a particular type of reading strategy the student employed, the protocols as presented earlier in Table 5.7 look like the following:



**Table 5.8 A Sample Analysis on Assigning Descriptive Reading Labels**

<b>Sentence no. &amp; text</b>	<b>Student's protocols</b>	<b>Sub-category</b>	<b>Coded reading strategy</b>
It was a beautiful island, but its fertile plains and shores rocked and were unsteady. (Bali Travel Information, sentence 4)	I don't understand what the words, 'fertile' and 'shore' mean.	Self-monitoring	Identify the source of reading problem
	I'll read again. So, it was a beautiful island...	Self-monitoring	Reread
	I think I'll just skip this sentence.	Selective attention	Skip to the next sentence

### 5.1.2.3 Setting up Coding Systems

For convenience when reference needs to be made, the coding systems have been set up to cater for three different types of data, namely, participants, text and transcription symbols and reading strategies, each of which is discussed in the following sections.

#### 5.1.2.3.1 Participants

With reference to Table 5.1, the letter 'P' is used to prefix the participants' numbers, so the students in the experimental group will be referred to as P1-P4, while P5 - P8 are assigned for the control group.

**Table 5.9 Student's Code**

<b>Group</b>	<b>Level of proficiency</b>	<b>Sex</b>	<b>Student's code</b>
Experimental	High	Female	P1
	High	Male	P2
	Low	Female	P3
	Low	Male	P4
Control	High	Female	P5
	High	Male	P6
	Low	Female	P7
	Low	Male	P8



### 5.1.2.3.2 Text and Transcription Symbols

When a particular sentence needs to be referred to in conjunction with the protocols the students produce, the letter “S” which is followed by a number is used to suggest a sentence number from which reference is made.

The two text titles are shortened for easy referencing: the first text entitled, “Did You Know We Live in a Greenhouse?” will be referred to as, “Greenhouse”, while “Bali” will be used to refer to the original text, “Bali Travel Information”. Therefore, an example of a set of coding as: “Bali, S4, P6”, will imply that reference is made to the text, “Bali Travel Information”, sentence number 4 and the protocols are verbalised by participant number 6.

Transcription symbols need to be set up although all think-aloud sessions were carried out in Thai. This is owing to the fact that two out of sixteen verbal protocols needed to be translated into English in order to check the reliability of coding. According to Smagorinsky (1994, p. 7), researchers need to “understand and delineate their own approach to the data, and to devise a coding system that describes the processes that their theory anticipates.”

Due to the specific nature of the data as reflected from the students’ verbal protocols, there is a need to develop a new coding scheme that emerges from and is consistent with the investigation of reading strategy use. The coding system in the current study has been developed and adopted with modification from various studies, some of which include Bracewell & Breuleux (1994) and Green & Higgins (1994). The transcription symbols employed are as follows:

**Table 5.10 A List of Transcription Symbols**

No.	Mark	Significance	Example
1	.	Period: used to mark the end of a sentence	Just continue reading to find out I suppose.
2	?	Question mark: used with interrogative sentences	Is the text going to be about tourism?
3	!	Exclamation mark: used with exclamatory sentences or interjections	Oh! I don’t know anything now. I’m confused!
4	( )	Curly brackets: used where the text is being translated into Thai	(Happiness then was brought back to the island once again.)



5	< >	Angle brackets: used where the text is being vocalised	<The gods came to meet and discuss.>
6	“ ”	Double quotation marks: used where direct reference is made to words or phrases taken from the text	“Negotiate?” What is it? What does it mean?
7	‘ ’	Single quotation marks: used where emphasis is highlighted by the researcher	I think “bemos” and ‘hitchhikes’ are similar.
8	...	Multiple periods: used to mark parts of words or phrases that are cut off or unfinished	‘...sharing the car with. You never know who will end up sharing the car with, but it could be ducks, chickens,...’
9	::	Double colons: used to indicate prolongation of syllables	“Ef::f::icientl::y.”
10	[ ]	Square brackets: used for all additional information or explanations made by the researcher	“Regulator.” [while looking the word up in the dictionary]
11	* *	Bracketing asterisks: used for all interruptions made by the researcher	*It’s actually -18° C.*
12	-	Hyphen: used to set strategies apart by beginning on a new line	- Is it going to be about the local transportation? - <Local transportation>

### 5.1.2.3.3 Metacognitive and Cognitive Strategies

The two initials “M” and “C” have been assigned for metacognitive and cognitive strategies respectively. After all reading labels for both types of strategies were completed, each reading strategy was coded according to the particular category it belongs to as follows:

**Table 5.11 A List of Reading Strategies in the Metacognitive Category**

Metacognitive category	Reading strategy as found in the main study
M1 Advance organisation	M1.1 Guess from title or sub-title M1.2 Preview the text
M2 Advance preparation	Not found in use in the main study.



M3 Selective attention	<p>M3.1 Pay attention to key words</p> <p>M3.2 Pay attention to the use of punctuation marks</p> <p>M3.3 Skip to the next sentence</p>
M4 Self-monitoring	<p>M4.1 Recognise reading problems one's having</p> <p>M4.2 Identify the source of reading problems</p> <p>M4.3 Asking for information about the text</p> <p>M4.4 Verify one's understanding of the text</p> <p>M4.5 Check one's understanding of the text</p> <p>M4.6 Correct one's understanding of the text</p> <p>M4.7 Integrate information with previous sentence</p> <p>M4.8 Talk to the text</p> <p>M4.9 Read ahead</p> <p>M4.10 Continue reading</p> <p>M4.11 Reread</p>
M5 Self-evaluation	Not found in use in the main study.

**Table 5.12 A List of Reading Strategies in the Cognitive Category**

<b>Cognitive category</b>	<b>Reading strategy as found in the main study</b>
C1 Resourcing	<p>C1.1 Look up in dictionary</p> <p>C1.2 Fit meaning into context</p>
C2 Grouping	C2.1 Make use of grouping
C3 Note taking	Not found in use in the main study.
C4 Summarising	C4.1 Summarise the content read
C5 Deduction	C5.1 Apply known rules
C6 Imagery	C6.1 Visualise information



C7 Auditory representation	C7.1 Vocalise
C8 Elaboration	C8.1 Activate known vocabulary C8.2 Activate previous knowledge C8.3 Relate to personal experience
C9 Transfer	C9.1 Translate into Thai
C10 Inferencing	C10.1 Guess unknown words C10.2 Infer overall meaning from context C10.3 Make a prediction C10.4 Make use of illustrations C10.5 Identify reference

After being coded, the protocols presented earlier in Table 5.8 are coded as follows:

**Table 5.13 A Sample of Coded Protocols**

Sentence no. & text	Student's protocols	Reading strategy
S4 It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	- I don't understand what the words, 'fertile' and 'shore' mean.	M4.2 Identify the source of reading problem
	- I'll read again. So, it was a beautiful island...	M4.11 Reread
	- I think I'll just skip this sentence.	M3.3 Skip to the next sentence

### 5.1.3 Analysis Procedure

After all the transcriptions were encoded, the reading strategies were established and defined according to their corresponding metacognitive and cognitive strategies. Each is presented in a tabular format as can be found in Section 5.1.3.1. Details of how the procedure of reliability coding was carried out are discussed in Section 5.1.3.2.



### 5.1.3.1 Categorisation and Definition of Strategies

The categorisation as proposed in this section is originally derived from the framework of learning strategies taught in the Cognitive Academic Language Learning Approach (CALLA) as proposed by O'Malley and Chamot's (1990, pp. 198-199). A list of learning strategies has been developed in the three main categories of metacognitive, cognitive and social and affective strategies.

The researcher keeps all types of learning strategies as they are but made some modification to suit what is being explored in this study. As mentioned earlier reading strategies are a sub-set of learning strategies, they can also be categorised and defined to reflect what readers do when they read.

Based on the think-aloud main study, 32 reading strategies were identified according to two main types of metacognitive and cognitive categories. The categorisation and definition of reading strategies serve two purposes in proposing the strategies as well as presenting the findings as found in the main study.

**Table 5.14** Categorisation and Definition of Reading Strategies in the Metacognitive Category

Category	Reading strategy	Definition	Example from protocols
M1 Advance organisation	M1.1 Guess from title or sub-title	M1.1 The readers familiarise themselves with the topic by guessing what the text is going to be about before attempting to read the text.	M1.1 I think the text is going to introduce some of the tourist attractions in Bali or perhaps give an overview of ... what Bali's like or what the history of Bali's like... something like that. ("Bali", S2, P2)
	M1.2 Preview the text	M1.2 The readers preview text features, e.g., title, sub-title, layout, illustrations, to organise text information before reading.	M1.2 I think the passage has been taken from the Internet. Just by looking at the top of the page over here, they're headings where you can click to choose from. Each of which leads you to different sections of the text. (Bali, S1, P1)



<p>M3 Selective attention</p>	<p>M3.1 Pay attention to key words</p> <p>M3.2 Pay attention to the use of punctuation marks</p> <p>M3.3 Skip to the next sentence</p>	<p>M3.1 The readers pay attention to certain key words in the sentence.</p> <p>M3.2 The readers take note of the use of punctuation marks and their functions.</p> <p>M3.3 The readers ignore inessential words or unknown parts and move on to the next sentence.</p>	<p>M3.1 I can see the word “very cheap” at the end of this sentence which suggests that you should go and visit Bali as it’s not too expensive. (“Bali”, S21, P5)</p> <p>M3.2 I can see inverted commas which suggest a proper or specific name. The soubriquet of the Great Mountain is, therefore, “the Morning of the World”. (“Bali”, S9, P5)</p> <p>M3.3 Forget about what “tiny” means. After all, it’s only an adjective. (“Bali”, S25, P6)</p>
<p>M4 Self-monitoring</p>	<p>M4.1 Recognise reading problems one’s having</p> <p>M4.2 Identify the source of reading problems</p> <p>M4.3 Asking for information about the text</p> <p>M4.4 Verify one’s understanding of the text</p>	<p>M4.1 The readers become aware that they are having comprehension problems.</p> <p>M4.2 The readers identify what reading problems hinder their understanding of the text.</p> <p>M4.3 The readers pose questions to themselves concerning the information in the text.</p> <p>M4.4 The readers justify the way they understand the text by making clarification or interpreting the meaning of the text.</p>	<p>M4.1 I finished reading. Have no ideas what it’s all about. “Greenhouse”, S8, P6)</p> <p>M4.2 Up til now, I still have no clear ideas of what “global warming” means. (“Greenhouse”, S23, P7)</p> <p>M4.3 Huh? But how can plants and trees help regulating the atmosphere? (“Greenhouse”, S20, P2)</p> <p>M4.4 Ah, so the car you will be traveling in is also used for transporting sheep, chickens, etc., and what you have to do is to ask the driver if you can have a ride. Is this what the text wants to say? (“Bali”, S20, P2)</p>



	<p>M4.5 Check one's understanding of the text</p>	<p>M4.5 The readers check to confirm if their previous guess is correct.</p>	<p>M4.5 Aha! It really does discuss the greenhouse effect ("Greenhouse", S7, P2)</p>
	<p>M4.6 Correct one's understanding of the text</p>	<p>M4.6 The readers realise they misunderstand certain part(s) of the information and try to correct their understanding.</p>	<p>M4.6 Do 'ducks and chickens' come with the "women off to the market to sell their produce"? Oh, no! Oh, no! These 'ducks and chickens' have nothing to do with the women. ("Bali", S20, P2)</p>
	<p>M4.7 Integrate information with previous sentence</p>	<p>M4.7 The readers keep the meaning of the text in mind and make association when possible.</p>	<p>M4.7 "The best way to get ...". Umm, "best" and "bicycle"... If I can link up with what it said earlier about how dangerous a motorbike is, that means a bicycle is much safer. ("Bali", S32, P5)</p>
	<p>M4.8 Talk to the text</p>	<p>M4.8 The readers respond to the text actively while reading in the same way they do when engaged in a conversation. Some of the responses include comments to show if they agree or disagree with certain concepts presented in the text. They also make personal remarks or ask follow-up questions to the text while reading.</p>	<p>M4.8 Yes. And how could I be of help? The number of the world population is so large. What if I help, while others just don't bother? It is not going to be very effective, is it? Let me read now. I'll see what I can do about it. ("Greenhouse", S26, P2)</p>
	<p>M4.9 Read ahead</p>	<p>M4.9 The readers read ahead to find the information in the next part of the text help with their comprehension.</p>	<p>M4.9 These two sentences probably discuss... I think I should read the next sentence beginning with 'without' first. ("Bali", S8, P1)</p>



	M4.10 Continue reading	M4.10 The readers continue to read even though they are experiencing comprehension problems.	M4.10 Don't know what "dakar" means. Just continue reading, I suppose. ("Bali", S22, P8)
	M4.11 Reread	M4.11 The readers reread the text for better understanding.	M4.11 Don't understand this. Let me read again. ("Bali", S20, P6)

**Table 5.15**    **Categorisation and Definition of Reading Strategies in the Cognitive Category**

Category	Reading strategy	Definition	Example from protocols
C1 Resourcing	C1.1 Look up in dictionary	C1.1 The readers find or check the meaning of words in the dictionary.	C1.1 Don't know what "fertile" means, I'll look it up in the dictionary. ("Bali", S4, P3)
	C1.2 Fit meaning into context	C1.2 The readers try to match the closest meaning of the unknown words with the context.	C1.2 There's no "regulator" here. 'To regulate' means 'to control', so "regulator" should mean something like 'controller'. ("Greenhouse", S20, P2)
C2 Grouping	C2.1 Make use of grouping	C2.1 The readers take note of how related items are grouped together.	C2.1 Umm... "Ducks" and "chickens"... Actually, they're all poultry. ("Bali", S20, P5)
C4 Summarising	C4.1 Summarise the content read	The readers make a summary of what being read.	C4.1 Under this subtitle... the second subtitle, it mainly discusses about what causes global warming. ("Greenhouse", S15, P1)
C5 Deduction	C5.1 Apply known rules	The readers use grammatical rules they know to assist comprehension while reading.	C5.1 Destroying forests or "deforestation..." Here, "deforestation" should carry the same meaning as 'destroying forests'. This is because 'de' is a prefix preceding the stem. 'De' conveys a negative meaning and so does "deforestation". ("Bali", S22, P1)



C6 Imagery	C6.1 Visualise information	C6.1 The readers make use of visual images to better their comprehension of the text.	C6.1 The words, “sun’s heat” and “Earth’s surface” make me think of the earth’s orbit, the characteristics of the planets and the heat which radiates from the sun to the Earth. (“Greenhouse”, S6, P5)
C7 Auditory representation	C7.1 Vocalise	C7.1 The readers vocalise while reading to help with their understanding of the text.	C7.1 Bali is at your fingertips. (“Bali”, S18, P1)
C8 Elaboration	C8.1 Activate known vocabulary	C8.1 The readers familiarise themselves with the words they know by going over their meanings to themselves.	C8.1 “Mountain... island... balance”. These words suggest that nature is in balance. “Calm” means ‘peaceful’, so it should indicate that it’s peaceful here. (“Bali”, S6, P5)
	C8.2 Activate previous knowledge	C8.2 The readers make use of their academic as well as world knowledge to help them understand the content of the text.	C8.2 And Bali should be part of Indonesia, isn’t that right? (“Bali”, S1, P4)
	C8.3 Relate to personal experience	C8.3 The readers relate the information they are reading to their personal experience.	C8.3 “Morning of the world”... “Magical island...” Oh. Oh. It says here that Indonesia consists of thousand islands. But from what I remember in my schooldays, doesn’t it have more than 3,000 islands? (“Bali”, S9, P2)
C9 Transfer	C9.1 Translate into Thai	C9.1 The readers draw what they already know about language to help them understand the text.	C9.1 This sentence simply wants to say that everybody knows that flowers, fruit and vegetables can be grown in a greenhouse, but did you know that we humans also live in a “greenhouse”? (“Greenhouse”, S3, P1)



C10 Inferencing	C10.1 Guess unknown words	C10.1 The readers guess unknown words using contextual clues.	C10.1 “Trapping” ... Not sure if it means something like ‘keeping inside’. (“Greenhouse”, S14, P3)
	C10.2 Infer overall meaning from context	C10.2 The readers make inferences from the text while reading.	C10.2 The Balinese are somehow very “friendly”. They’re always greeting one another whenever they meet. (“Bali”, S33. P2)
	C10.3 Make a prediction	C10.3 The readers predict the direction of the incoming text while reading.	C10.3 My guess is that the text is going to talk about how these gases have an effect on the atmosphere as well as the greenhouse effect? Is that so? (“Greenhouse”, S18, P2)
	C10.4 Make use of illustrations	C10.4 The readers make use of the illustrations while reading.	C10.4 I also make a reference to the illustration. (“Greenhouse”, S4, P5)
	C10.5 Identify reference	C10.5 The readers make references from the text while reading.	C10.5 “They” here should refer to “plants and trees” which are natural regulators of the atmosphere. (“Greenhouse”, S21, P1)

### 5.1.3.2 Reliability of the Coding

The data used in the study were based on two think-aloud sessions which took place in the pre- and post- instructional periods with 8 students which resulted in 16 protocols. The researcher classified and encoded all the students’ protocols in consultation with her supervisor. As all data was coded by the researcher herself, the analysis procedure had undergone different stages to ensure that the coding system was consistent throughout.



After all of the transcriptions were encoded, the researcher developed a specific definition for each type of reading strategy, and made a list of all of the protocols that had been assigned accordingly. This was to ensure that each strategy was distinct from one another or to avoid having an overlapped categorisation. Some of the protocols that were listed under M4.2 “identify the source of reading problems” can be exemplified in the next table.

**Table 5.16 Sample Protocols Listed under M4.2**

Text	Student’s protocols listed under M4.2
It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	- What is this? What does “fertile” mean? (Source: Bali, S4, P2)
It would appear that the atmosphere is trapping too much heat and causing the Earth to heat up.	- Trapping.” I don’t know what it means. (Source: Greenhouse, S14, P1)
Those looking for adventure can try the local “bemos”.	- I still don’t know what “bemos” means? (Source: Bali, S19, P6)
They decided the answer lay in placing a mountain upon the island, to balance, and calm it.	- I don’t understand this sentence. It’s from here. I don’t know what ‘placing’ means. I know what a ‘place’ is, but not, ‘placing’. (Source: Bali, S6, P5)

Next, the researcher read each protocol carefully again to see how accurately it was assigned to a particular category. This process was carried out over different periods of time so that the researcher was able to see things from a different perspective at different times. After making sure that all listed protocols belonged to the particular reading strategy assigned, the researcher made all necessary changes to the definitions and counted the frequency of strategies found in the transcriptions.

Finally, two protocols with the most varied types of metacognitive and cognitive strategies employed were selected for the purpose of checking the reliability of coding. Both selected protocols were from the same student in the experimental group referred to as ‘P2’ and were based on the two texts, “Did You Know We Live in a Greenhouse?” and “Bali Travel Information”. The translated versions of protocols were sent to be read and commented on by two Thai colleagues who have sound knowledge of both English and Thai. The full transcriptions of both protocols can be found in Appendix I.



After that, three independent judges were asked to read and rate whether they agree with the existing scheme of coding. The judges were advised to read the information as presented in Table 5.14 and Table 5.15 first as it enables them to form some ideas of what criteria the researcher based the analysis on. They then proceeded to both transcriptions and expressed their opinion whether they agreed or disagreed with the researcher's analysis.

Based from both texts on "Greenhouse" and "Bali", the total frequency of strategies categorised and counted by the researcher was 72 and 83 respectively. Details of the judges' agreement in coding can be found in Table 5.17.

**Table 5.17 The Rate of Judges' Agreement in Coding**

Text	No. of strategies as identified by the researcher		No. of strategies as agreed by					
			Judge 1		Judge 2		Judge 3	
	Total	%	Total	%	Total	%	Total	%
Greenhouse	72	100	69	95.83	69	95.83	67	93.06
Bali	83	100	79	95.18	80	96.39	79	95.18

On the average, the percentage rate of agreement among the three judges ranged from 93 – 95 which suggests a very high level of agreement. In case of disagreement, the judges' interpretations and explanations were given to the researcher. However, as there were very few of such cases, the protocols and reading strategies as previously identified and categorised by the researcher were kept unchanged. The results of think-aloud findings will be discussed in the next section.

#### **5.1.4 Results of the Think-Aloud Study**

The frequency of strategies was coded and counted based on the categorisation and definition of strategies proposed in Section 5.1.3.1. Data were collected in two different ways: records of different types of strategies employed as well as the frequency of how often each strategy was used in both think-aloud sessions. Data presented in this section will be in answer to research questions 1, 2 and 3 in three different sections as follows:



5.1.4.1 Overall Types and Frequency of Reading Strategies Employed by the Eight Students in the Main Study

5.1.4.2 A Comparison of Reading Strategies Employed between High- and Low- Proficiency Students

5.1.4.3 A Comparison of Reading Strategies Used over Time between Both Groups

#### 5.1.4.1 Overall Types and Frequency of Reading Strategies Employed by the Eight Students in the Main Study

In response to research question 1, data based on the 16 verbalisations reveals that the students in both groups have extensive use of metacognitive and cognitive strategies. However, none of the strategies in the social/affective category were reported. A full list of data including overall types and frequency of reading strategies can be found in Appendix J.1.

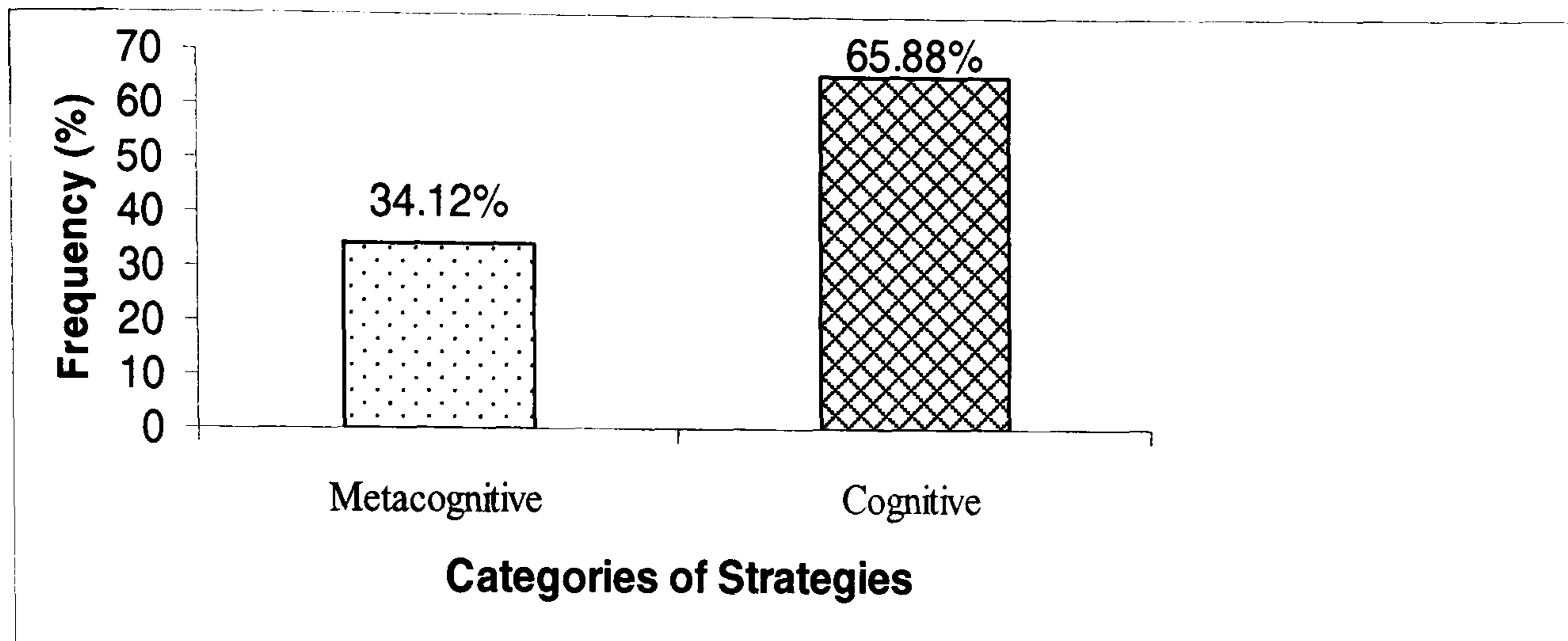
Out of the total of 1,105 instances of strategy use from the 8 students who took part in the main think-aloud study, 32 types of reading strategies were identified in metacognitive and cognitive categories. The strategy breakdown is as follows:

**Table 5.18 Overall Frequency of Metacognitive and Cognitive Categories**

Category	Frequency based on		Total	Percentage
	Greenhouse	Bali		
Metacognitive	182	195	377	34.12
Cognitive	343	385	728	65.88
<b>Total</b>	<b>525</b>	<b>580</b>	<b>1105</b>	<b>100</b>

Based on Table 5.18, it can be clearly seen that the strategies in the cognitive category were employed at a higher rate than those in the metacognitive category, with the percentage of 65.88 against 34.12 which can be presented in Figure 5.1 as follows:



**Figure 5.1 Overall Frequency of Metacognitive and Cognitive Categories**

In the following discussion, metacognitive and cognitive categories will be first divided into sub-categories and then sub-divided into their subsequent strategies. The same code as used when discussing the strategy questionnaire in Chapter 4 will be applied. The distribution of the frequency that comes in each sub-category is based on the two reading texts used in think-aloud sessions and can be summed up as in the table below.

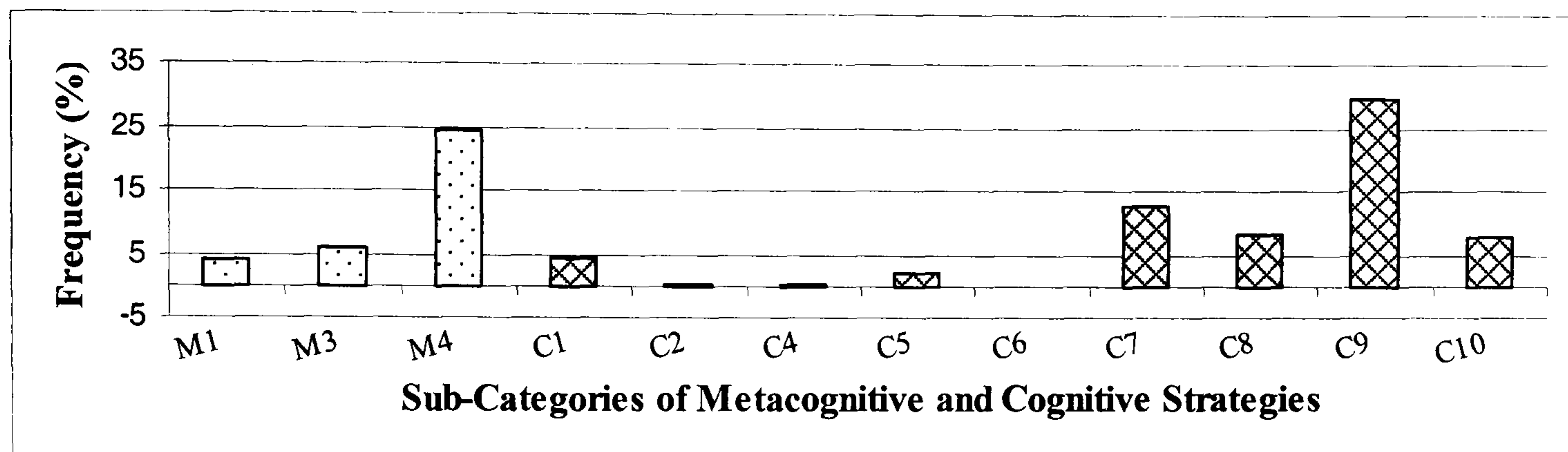
**Table 5.19 Distribution of Metacognitive and Cognitive Sub-Categories**

Sub-category	Frequency as found in		Total	Percentage
	Greenhouse	Bali		
M1 Advance organisation	17	26	43	3.89
M3 Selective attention	37	27	64	5.79
M4 Self-monitoring	128	142	270	24.43
C1 Resourcing	11	36	47	4.25
C2 Grouping	2	1	3	0.27
C4 Summarising	2	3	5	0.45
C5 Deduction	3	19	22	1.99
C6 Imagination	1	0	1	0.09
C7 Auditory representation	64	76	140	12.67
C8 Elaboration	47	45	92	8.33
C9 Transfer	178	152	330	29.86
C10 Inferencing	35	53	88	7.96
<b>Total:</b>	<b>525</b>	<b>580</b>	<b>1105</b>	<b>100.00</b>



Based on Table 5.19, the sub-category of C9 Transfer gained the highest frequency of 330 which was equivalent to 29.86 per cent, followed by M4 Self-monitoring (270, 24.43%) and C7 Auditory representation (140, 12.67%). Some of the sub-categories reported at a low frequency included C4 Summarising (5, 0.45%), C2 Grouping (3, 0.27%) and C6 Imagination (1, 0.09%). Details of each sub-category distribution can be presented in Figure 5.2.

**Figure 5.2** Distribution of Metacognitive and Cognitive Sub-Categories



All sub-categories and their subsequent strategies in both main categories will be discussed next. While the sub-categories of metacognitive strategies together with samples of protocols are discussed in Section 5.1.4.1.1, the presentation of cognitive sub-categories is found in Section 5.1.4.1.2, followed by the summary of the strategy use in both sub-categories.

#### **5.1.4.1.1 Discussion of Metacognitive Sub-Categories**

According to O'Malley and Chamot (1990, p. 197), metacognitive strategies "involve executive processes in planning for learning, monitoring one's comprehension and production, and evaluating how well one has achieved a learning objective." In this study, metacognitive strategies refer to "attempts or initiations readers consciously take to facilitate their reading process. They include making a plan, monitoring and checking their understanding".

Based on both think-aloud sessions, the students' protocols reflected the use of metacognitive strategies which can be matched with the three sub-categories in M1 Advance organisation, M3 Selective attention and M4 Self-monitoring.

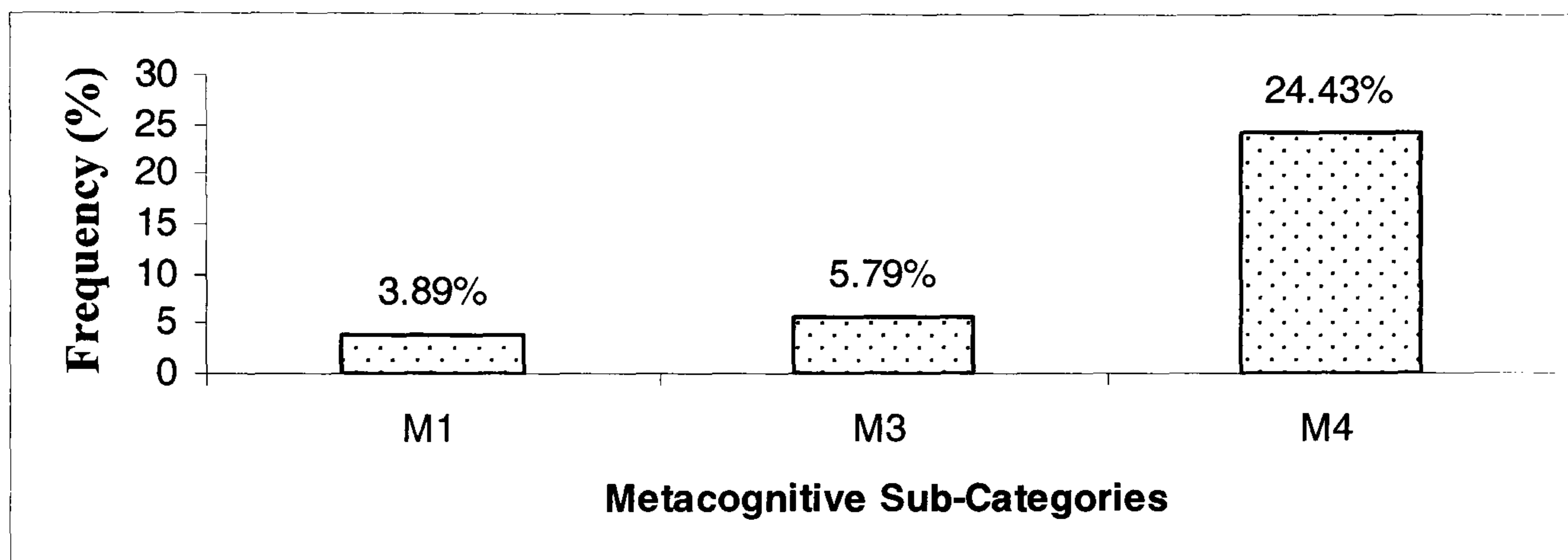


The rate of frequency was found to be of 377 which was equivalent to 34.12 per cent, and 16 reading strategies were identified. The frequency of each metacognitive sub-category is presented in Table 5.20.

**Table 5.20 Frequency of Metacognitive Sub-Category**

Sub-category	Frequency as found in		Total	Percentage
	Greenhouse	Bali		
M1 Advance organisation	17	26	43	3.89
M3 Selective attention	37	27	64	5.79
M4 Self-monitoring	128	142	270	24.43
<b>Total</b>	<b>182</b>	<b>195</b>	<b>377</b>	<b>34.12</b>

**Figure 5.3 Frequency of Metacognitive Sub-Category**



As can be seen from Table 5.20 and Figure 5.3, M4 Self-monitoring gained the highest frequency, followed by M3 Selective attention and M1 Advance Organisation. Discussion of each metacognitive sub-category will be presented in the order of M1, M3 and M4.

### **M1 Advance Organisation**

Generally, the strategies in M1 Advance organisation are used by readers before they attempt to read the text in detail. What readers normally do includes running their eyes over text elements, such as, title, layout, illustrations, etc., in order to get some general ideas about the text. Some readers also try to familiarise themselves with the topic of the text by making a prediction about its content as well as making use of their experience.



In this study, two reading strategies were found in M1 which are coded and labelled as M1.1 “guess from title or sub-title” and M1.2 “preview the text”. The frequency of M1.1 was far higher in the main study when compared to M1.2 as can be seen in Table 5.21.

**Table 5.21 Frequency of M1 Advance Organisation**

Strategy	Frequency	Percentage
M1.1 Guess from title or sub-title	30	2.71
M1.2 Preview the text	13	1.18
<b>Total of M1</b>	<b>43</b>	<b>3.89</b>

In the main study, all of the 8 students made use of M1.1 “guessing from title or sub-title” before they actually started reading. This resulted in the total frequency rate of 30, 2.71 per cent of total strategy use. Their guesses were primarily based on the prediction about the content of the text as in:

**Table 5.22 Student’s Protocol Reflecting M1.1**

Text	Student’s protocol reflecting M1.1
Did you know we live in a Greenhouse?	- Umm... Generally, “Greenhouse” should be something that has to do with hot weather. Something to do with the greenhouse effect. (Source: Greenhouse, S1, P3)
Bali Travel Information	- Travel... Bali ... Information... That suggests some kind of invitation to visit Bali. It may come from the hotels or it may be the promotion campaign from the travel agencies there. (Source: Bali, S1, P5)

M1.2 “previewing the text” is another way of scanning the text for its organisation. In this study, a student who was coded as P1 made extensive use of M1.2, 6 out of the total of 13 instances. She constantly previewed the text features which include title, sub-title and layout. Some of her remarks include:



**Table 5.23 Student's Protocol Reflecting M1.2**

Text	Student's protocol reflecting M1.2
Did you know we live in a Greenhouse?	- This is the topic. (Source: Greenhouse, S1, P1)
Bali Travel Information	- I think the passage has been taken from the Internet. Just by looking at the top of the page over here, they're headings where you can click to choose from. Each of which leads you to different sections of the text." (Source: Bali, S1, P1)

### M3 Selective Attention

As suggested by its name, M3 includes the way the readers pay attention to key words, linguistic markers, sentences, or types of information. By doing so, they sometimes ignore some parts they have found unimportant or difficult to understand.

M3 Selective attention (64, 5.79%) consists of three strategies which are, M3.1 "pay attention to key words", M3.2 "pay attention to the use of punctuation marks" and M3.3 "skip to the next sentence". Among them, M3.2 was used most frequently.

**Table 5.24 Frequency of M3 Selective Attention**

Strategy	Frequency	Percentage
M3.1 Pay attention to key words	19	1.72
M3.2 Pay attention to the use of punctuation marks	24	2.17
M3.3 Skip to the next sentence	21	1.90
<b>Total of M3:</b>	<b>64</b>	<b>5.79</b>

Owing to the fact that, punctuation marks are massively used in written texts, their use should have been recognised among individual students resulting in high frequency. However, think-aloud protocols helped to reveal that not all of the students were consciously aware of them. The rate of frequency among individual students in using M3.2 ranged from the highest of 10 to 0.



Among the 8 students, some were more aware of the significance of punctuation marks more frequently than others especially the two students who were coded as, P1 and P5. Both of them took note of the punctuation features and referred to their functions explicitly while reading.

**Table 5.25 Student's Protocol Reflecting M3.2**

Text	Student's protocol reflecting M3.2
Did you know we live in a Greenhouse?	- I can see a question mark which suggests that it's a question. (Source: Greenhouse, S1, P5)
The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b> , " <b>The Morning of the World</b> ", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b> .	- Here... According to the legend, this is how the mountain got its name. There're two dashes which come before and after the name, suggesting that it's the name of the mountain. (Source: Bali, S9, P1)

The strategy of M3.3 "skip to the next sentence" came in second place with the frequency of 21, 1.90 per cent of total strategy use. Seven out of 8 tended to skip reading and move on to the next sentence when they failed to understand difficult vocabulary or sentence. It was sometimes due to their judgment that certain words were not crucial in a particular context.

**Table 5.26 Student's Protocol Reflecting M3.3**

Text	Student's protocol reflecting M3.3
Plants and trees are natural regulators of the atmosphere.	- Don't know what "regulator" means. I think I'll just skip it. (Source: Greenhouse, S20, P1)
The fact of the matter is that global warming could easily mean changes to our daily lives.	- Don't understand this sentence. I'll skip it for the time being. (Source: Greenhouse, S24, P1)
The tiny horses seem to be amazingly strong for their size.	- What does "tiny" mean? Oh well, just forget it. After all, it's only an adjective. (Source: Bali, S24, P6)



Lastly in this sub-category of M3 Selective Selection, 5 out of 8 students used the strategy of M3.1 “pay attention to key words”. They did so by focusing their attention on a few key words that they thought were important within the sentence. Based on these words, they later tried to figure out the direction or the overall meaning of the sentence they were reading. This strategy gained the frequency of 19, 1.72 per cent of all strategies. Some of the students’ protocols that reflect this strategy can be found below.

**Table 5.27 Student’s Protocol Reflecting M3.1**

Text	Student’s protocol reflecting M3.1
The average temperature of the Earth's surface with the greenhouse effect is 15 degrees Celsius.	- Celsius. Fifteen degrees Celsius. (Source: Greenhouse, S8, P2)
We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things.	- I can see the words, “green”, “perfect planet” and “growing and living things”. They’re all suggesting something positive. (Source: Bali, S24, P6)

#### **M4 Self-Monitoring**

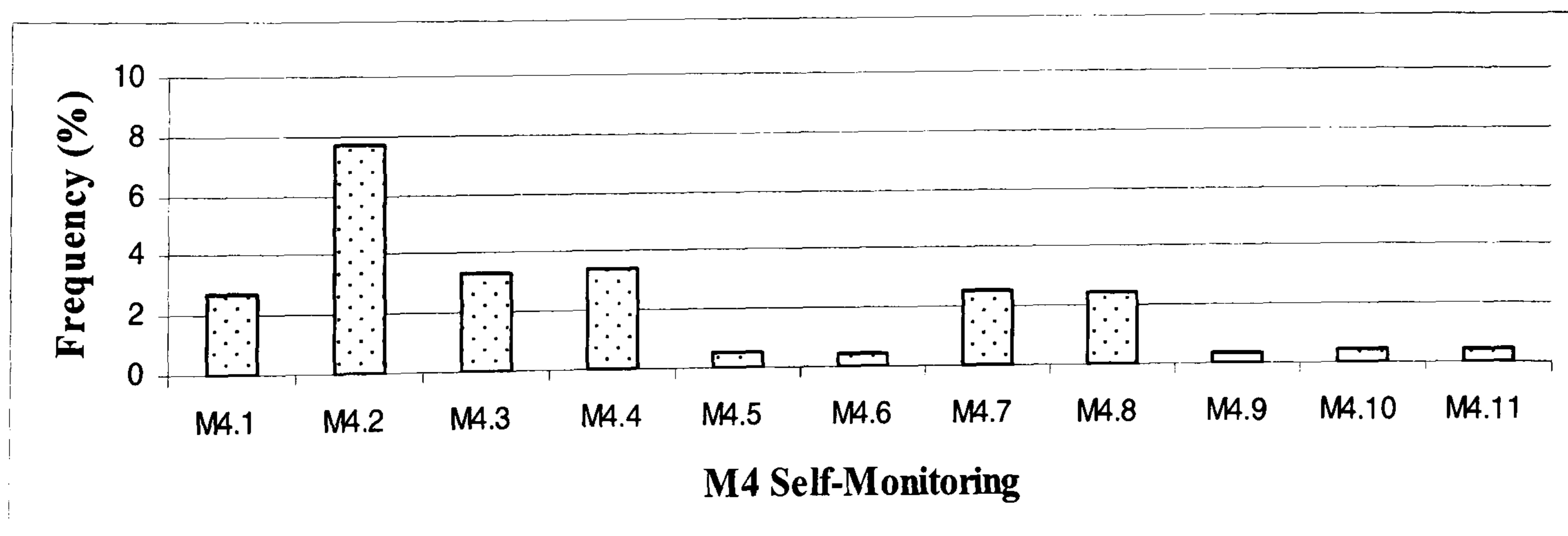
Self-monitoring involves strategies the readers consciously and regularly use to check their comprehension of the text as well as those they employ when the text becomes too difficult for them to understand. As discussed earlier in Section 5.1.4.1 M4 gained the highest score in relation to its frequent use among metacognitive sub-categories, each of the strategies under M4 will be discussed in detail in this section. To give an overview of M4 Self-monitoring, there were 270 instances reported which amounted to 24.43 per cent of the overall strategies. Self-monitoring consists of 11 different types of reading strategies and can be summarised as in the following table.



**Table 5.28** Frequency of M4 Self-Monitoring

Strategy	Frequency	Percentage
M4.1 Recognise reading problems one's having	30	2.71
M4.2 Identify the source of reading problems	85	7.69
M4.3 Asking for information about the text	37	3.35
M4.4 Verify one's understanding of the text	38	3.44
M4.5 Check one's understanding of the text	6	0.54
M4.6 Correct one's understanding of the text	5	0.45
M4.7 Integrate information with previous sentence	28	2.53
M4.8 Talk to the text	27	2.44
M4.9 Read ahead	4	0.36
M4.10 Continue reading	5	0.45
M4.11 Reread	5	0.45
<b>Total of M4:</b>	<b>270</b>	<b>24.43</b>

Under self-monitoring sub-category, the strategies that were used most frequently were M4.2 “identify the source of reading problems”, M4.4 “verify one’s understanding of the text” and M4.3 “asking for information about the text”, while M4.9 “read ahead”, M4.11 “reread”, and M4.10 “continue reading” were reported at a low frequency. The distribution of M4 strategies can be presented in the next figure.

**Figure 5.4** Distribution of Self-Monitoring



Due to strategy categorisation, M4 Self-monitoring included a number of strategies the students employed to maximise their understanding of the text as well as those they used when comprehension did not take place. In the following discussion, related strategies will be grouped together and supported by appropriate think-aloud protocols.

First of all, data from the main study shows that the students were highly aware of the reading problems they were having, and some tried to identify more precisely the source of their reading problems. These two strategies have been coded as M4.1 and M4.2 respectively.

The strategy of M4.2 which involves identifying the source of reading problems came highest among the 11 strategies with 85 instances reported which was equivalent to 7.69 per cent of total strategy use. The related strategy of M4.1 was also scored high in the fourth place with 30, 2.71 per cent of all strategies.

The main difference between M4.1 and M4.2 was whether the students took a step further to classify the type of problems they were having or not. As in M4.1 which was labelled as “recognise reading problems one’s having”, the students mainly showed their awareness of the reading difficulties they were having without being specific about the nature of the particular problems as in Table 5.29.

**Table 5.29 Student’s Protocol Reflecting M4.1**

Text	Student’s protocol reflecting M4.1
The average temperature of the Earth’s surface with the greenhouse effect is 15 degrees Celsius.	- I’ve finished reading, but don’t understand what’s going on. (Source: Bali, S8, P6)
For a change of pace, negotiate a “ <i>dokar</i> ” the local horse and carriage that can carry three or four passengers.	- I’m getting more and more confused. I don’t understand. I don’t understand. I don’t understand at all. (Source: Bali, S22, P4)

However, as for those students who used M4.2, “identify the source of reading problems”, would take a step further in trying to identify what their reading problems were all about as in the following protocols.



**Table 5.30 Student's Protocol Reflecting M4.2**

Text	Student's protocol reflecting M4.2
And so they did.	- I can't make sense of what "And so they did". I simply don't know what "they did" here refers to. (Source: Greenhouse, S7, P7)
It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	- It's an island. It's a beautiful island. But, what are all these about? Plains? Shores? Rocked? Unsteady? I absolutely have no ideas of what these words mean. (Source: Bali, S6, P4)

Next, as mentioned earlier that comprehension is a crucial element of the reading process, some students were aware of it and used a number of strategies to monitor their comprehension. The strategies employed in the study included M4.4 "verify one's understanding of the text", M4.5 "check one's understanding of the text", M4.6 "correct one's understanding of the text" and M4.7 "integrate information with previous sentence". These strategies reflected what the students did while reading in order to help improve their comprehension. However, among them, the two strategies of M4.4 in verifying one's understanding of the text (38, 3.44%) and M4.7 in which the students tried to integrate information with previous sentence (28, 2.53%) were used more frequently than the others, and will be discussed more closely next.

In verifying their understanding of the text, the students tried to restate or interpret the way they perceived the text. By doing so, it helps them to build up the basic meaning of the sentence while making themselves understand the message the writers try to convey to the readers.

**Table 5.31 Student's Protocol Reflecting M4.4**

Text	Student's protocol reflecting M4.4
We are surrounded by a blanket of air called the atmosphere which has kept the temperature on Earth just right for centuries.	- I see. They're only drawing an analogy. An analogy between an atmosphere and a blanket of air. We live under the blanket in the sense that it is actually referring to the atmosphere. (Source: Greenhouse, S5, P2)
This is known as GLOBAL WARMING.	- Ah, so they want to define the term. Whatever has caused "the Earth to heat up" is called "global warming". (Source: Greenhouse, S15, P2)



Based on the main study, the strategy under M4.7 “integrating information with previous sentence” was found to be used most frequently by the student who was coded as P5. She made use of it consistently in both think-aloud sessions at the frequency of 16 out of the total use of 28. She always kept the meaning of the previous sentences she read in her mind and related to one another whenever possible, and this is revealed in her protocols, for example:

**Table 5.32 Student’s Protocol Reflecting M4.7**

Text	Student’s protocol reflecting M4.7
Without the natural greenhouse effect, the temperature would be -18 degrees Celsius.	- With reference to the word, “without”, I start to compare the information with what was said in the previous sentence. With or without the greenhouse effect makes a great difference which is either 15 with its effect or -18 without it. (Source: Greenhouse, S9, P5)
Perhaps the best way to get about is by bicycle.	- If I can relate it to what was said earlier about how a motor bike is dangerous, that suggests a bicycle is much safer then. (Source: Bali, S32, P5)

Apart from that, the students also regularly checked their understanding of the text and corrected it if they know they misunderstand certain parts of the text although the report of both strategies of M.3.5 and M4.6 were found to be comparatively low, 6 and 5 instances respectively. When having problems understanding the texts, some of the strategies the students employed to help improve their comprehension include: M4.10 “continue reading” (5, 0.45%), M4.11 “reread” (5, 0.45%) or M4.9 “read ahead” (4, 0.36%). However, these three strategies also had a low frequency.

Last but not least, the last two strategies under self-monitoring that reflect the active role the readers have were of “asking for information about the text”, coded as M4.3 and “talk to the text”, coded as M4.8. Each of which will be discussed next.

Based on think-aloud protocols, it was found that some students also posed questions to the text or sometimes to themselves while reading. The questions served several purposes, such as, asking questions of the text, doubting the truth of the text. Some protocols reflect that the questions also derived from the misinterpretation of vocabulary as in the protocol quoted by P7 where she misinterpreted the word, “addition” as “increase”.



**Table 5.33 Student's Protocol Reflecting M4.3**

Text	Student's protocol reflecting M4.3
We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things.	- Huh? But why does the text say, "We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things."? The greenhouse effect is always having a negative effect, isn't it? Huh! Or is it just my misunderstanding? (Source: Greenhouse, S7, P2)
Many scientists now believe that the addition of greenhouse gases from human or manmade sources is throwing our atmosphere and the natural greenhouse effect out of balance.	- About this "greenhouse" ... these "greenhouse gases" Why? Why do they need to be added? (Source: Greenhouse, S13, P7)

The strategy of M4.8 labelled as, "talk to the text", was unique and different from the rest of the other strategies in M4 Self-monitoring. This is because the strategy did not result from the problem in not understanding the text they were reading, rather the readers took a step further by responding actively to the text in the same way as if they were having a conversation with the text.

It is worth mentioning that data using this strategy only came from two male students who were coded as P2 and P6. They were both classified as proficient readers. P2 was from the experimental group, while P6 was from the control group. The frequency rate of their use of M4.8 was 27, 2.44% of all strategies. Their protocols reflected their personal remarks, agreement or disagreement with the text as well as their follow-up questions posed in the same way they would have done when engaged in a face-to-face conversation.

**Table 5.34 Student's Protocol Reflecting M4.8**

Text	Student's protocol reflecting M4.8
First of all, think about what causes global warming.	- Huh! But I simply can't do the thinking. "To think about what causes global warming." I am not a scientist! (Source: Greenhouse, S28, P6)
If cutting down forests and trees aids global warming, we should be sure to plant a new tree for every one that is cut down or burned.	- But you need to grow them according to the number that ... I wonder who can actually keep an accurate track of the number of trees which were cut down or burned. It's just like the situation where you close the barn door after the



Decide how you can help.	<p>horses have gone. How long ago were these trees cut down? In which century? It makes no sense. It's absolutely not practical. (Source: Greenhouse, S30, P2)</p> <p>"Can help?" But I'm only a student. Anyway, I would rather agree with the one suggesting about "burning the fuels" more efficiently. The latter? I just simply can't do it. Planting trees in the forests! It must be so hot out there. (Source: Greenhouse, S31, P2)</p>
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The discussion of M4 Self-monitoring which was the final metacognitive sub-category has now been completed. The focus in the next section will be turned towards cognitive sub-categories and their subsequent strategies.

#### 5.1.4.1.2 Discussion of Cognitive Sub-Categories

According to O'Malley and Chamot (1990, p. 197), in cognitive strategies, the learner "interacts with the material to be learned by manipulating it mentally (as in making mental images, or elaborating on previously acquired concepts or skills) or physically (as in grouping items to be learned into meaningful categories, or taking notes on important information to be remembered)." In this study, cognitive strategies refer to "steps readers take while engaging in the reading process to maximise their comprehension by making use of their available resources, previous knowledge or experience".

Based on two think-aloud sessions, the cognitive classification consists of nine sub-categories. Sixteen different reading strategies were identified out of the total frequency of 728 which was equivalent to 65.88 per cent of total strategy use. The distribution of the cognitive sub-categories is in Table 5.35.

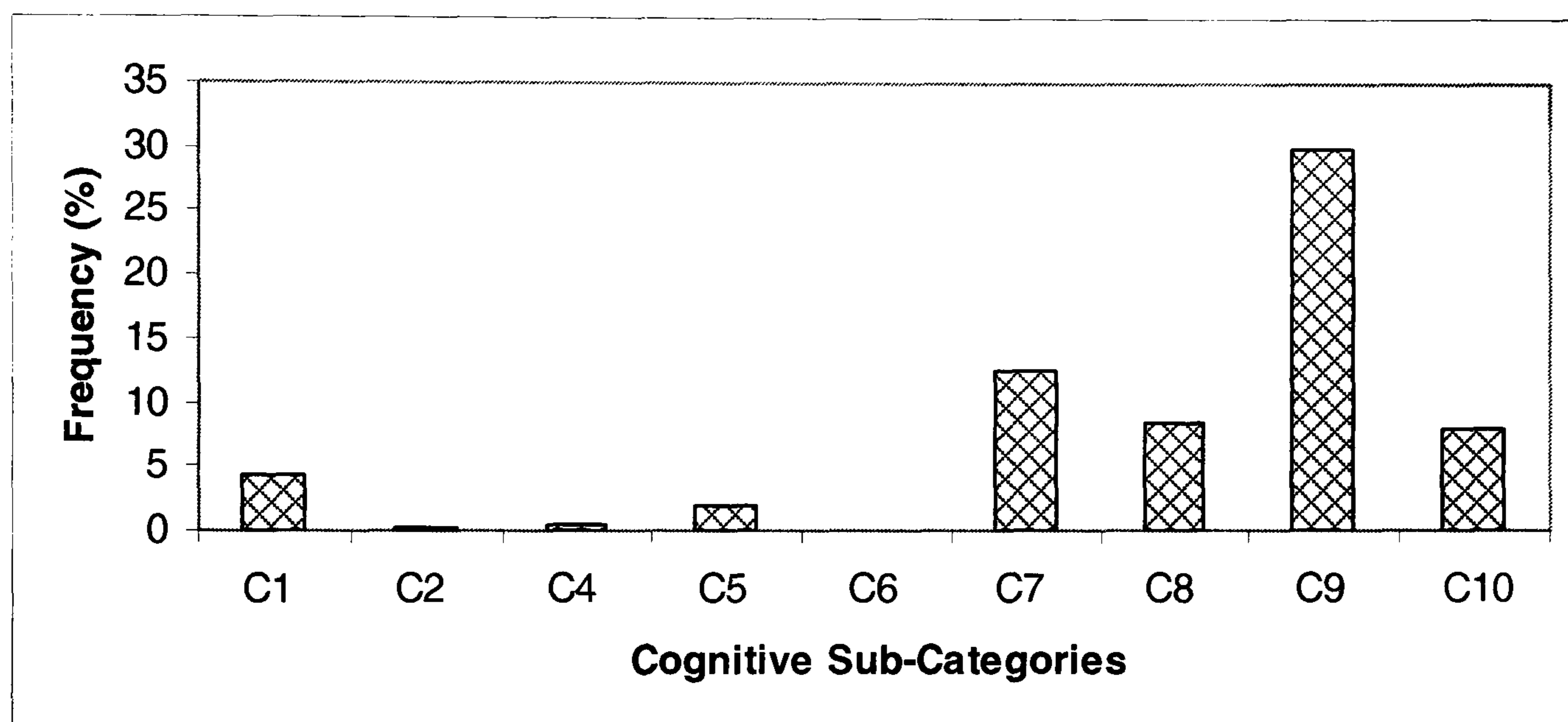
**Table 5.35 Frequency of Cognitive Sub-Category**

Sub-category	Frequency as found in		Total	Percentage
	Greenhouse	Bali		
C1 Resourcing	11	36	47	4.25
C2 Grouping	2	1	3	0.27



C4 Summarising	2	3	5	0.45
C5 Deduction	3	19	22	1.99
C6 Imagination	1	0	1	0.09
C7 Auditory representation	64	76	140	12.67
C8 Elaboration	47	45	92	8.33
C9 Transfer	178	152	330	29.86
C10 Inferencing	35	53	88	7.96
<b>Total:</b>	<b>343</b>	<b>385</b>	<b>728</b>	<b>65.88</b>

**Figure 5.5 Frequency of Cognitive Sub-Category**



As can be seen from Figure 5.5, C9 Transfer gained the highest frequency, followed by C7 Auditory representation and C8 Elaboration, while some strategies, such as, C4 Summarising, C2 Grouping, and C6 Imagination were reported at lowest frequency rates. Discussion of each cognitive sub-category will be presented in the order of C1 – C8.

### **C1 Resourcing**

As mentioned in 5.1.1.4 that dictionaries were allowed in the think-aloud, and it depended on the students' own choice to use it or not. Resourcing consists of 2 strategies: C1.1 "look up in dictionary" and C1.2 "fit meaning into context". Details are as follows:



**Table 5.36 Frequency of C1 Resourcing**

Strategy	Frequency	Percentage
C1.1 Look up in dictionary	37	3.35
C1.2 Fit meaning in context	10	0.90
<b>Total of C1</b>	<b>47</b>	<b>4.25</b>

Based from Table 5.36, it shows that some students chose to look the word up in the dictionary as a reference source although not all of them tried to match the closest meaning of the unknown words with the context. In the study, although only 3 out of 8 students used the dictionary when coming across unknown words, 2 of them, coded as P3 and P7 used C1.1 extensively with the frequency of 26 and 18 times respectively in both think-aloud sessions. In a single sentence from, “Bali Travel Information”, P7’s protocols showed that she went straight to the dictionary to look up the word “narrow”, fit its meaning in the context, moved on and repeated the same procedure again when she came across the word “exposed”.

**Table 5.37 Student’s Protocol Reflecting C1.1 and C1.2**

Text	Student’s protocol reflecting C1.1 and C1.2
Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.	<ul style="list-style-type: none"> <li>- Don't know what “narrow” means. [Look up the word “narrow” in the dictionary]</li> <li>- Oh, it means “thin”. So, it refers to the narrow Straits of Bali.</li> <li>- The Balinese are friendly... Oh, what about “exposed”? [Look up the word “exposed” in the dictionary]</li> <li>- It means something like “friendly”. So, the Balinese are more “open” to the tourists. (Source: Bali, S13, P7)</li> </ul>

## C2 Grouping

Grouping is the way the readers take note of how the related items are grouped together. There was a low frequency of use of this strategy in the main study of 3, reflected in 0.27 per cent of total strategy use.



**Table 5.38 Frequency of C2 Grouping**

Strategy	Frequency	Percentage
C2.1 Make use of grouping	3	0.27
<b>Total of C2:</b>	<b>3</b>	<b>0.27</b>

Based from Table 5.38, only 2 female students, coded as P1 and P5, who were from the experimental and the control group respectively made use of grouping in the same sentence and text as in:

**Table 5.39 Student's Protocol Reflecting C2.1**

Text	Student's protocol reflecting C2.1
<p>Some of our energy sources, known as fossil fuels, have been trapped beneath the ground for millions of years:</p> <ul style="list-style-type: none"> <li>• coal</li> <li>• oil</li> <li>• natural gas.</li> </ul>	<p>- And over here. They should belong to ... The three items that have been listed here should all belong to the three types of energy sources. These are the three types of energy sources. (Source: Greenhouse, S17, P1)</p> <p>- All these words, "coal, oil and natural gas", they should all come under the "fossil fuels". (Source: Greenhouse, S17, P5)</p>

#### **C4 Summarising**

According to O'Malley and Chamot (1990), the cognitive sub-category of summarising includes both "mental or written summary of information gained through listening or reading" (p. 198). As applied to the think-aloud study, the focus was, therefore, primarily on the way the readers make a mental summary of what was being read. This strategy was used at a low frequency with 5 instances from 3 students.

**Table 5.40 Frequency of C4 Summarising**

Strategy	Frequency	Percentage
C4.1 Summarise the content read	5	0.45
<b>Total of C4:</b>	<b>5</b>	<b>0.45</b>



During think-aloud sessions, the instances in which two male students recited the main points they read at the end of the paragraph are as follows:

**Table 5.41 Student's Protocol Reflecting C4.1**

Text	Student's protocol reflecting C4.1
2. Walk, ride your bike or take the bus more often.	- I think the overall text has to do with energy, the negative effect it has towards environment, something like that. (Source: Greenhouse, S37, P4)
The tiny horses seem to be amazingly strong for their size.	- To sum up, this paragraph is discussing another highlight of Bali which is a "dokar". It's a horse which is able to pull 3-4 passengers although it's such a small animal. (Source: Bali, S26, P8)

### C5 Deduction

As second language readers, this strategy refers to the way students make use of their knowledge about language in order to assist comprehension and solve reading problems they have. In the study, seven students used grammatical knowledge and this was reflected in a total frequency of 22, 1.99 per cent of overall strategies.

**Table 5.42 Frequency of C5 Deduction**

Strategy	Frequency	Percentage
C5.1 Apply known rules	22	1.99
<b>Total of C5:</b>	<b>22</b>	<b>1.99</b>

In the study, seven students used their knowledge about language in several ways to help them improve their understanding of the text. For example, single words like, "so" and "not" were interpreted in relation to their grammatical functions. In one instance, the part of speech of "average" was being explicitly examined to figure out its probable meaning. Moreover, some students tried to work out the meaning of a long and complex sentence by breaking it into smaller parts to make it easier to understand.



**Table 5.43 Student's Protocol Reflecting C5.1**

Text	Student's protocol reflecting C5.1
Of course we are not surrounded by glass.	- The word "not" suggests negation. (Source: Bali, S4, P5)
And so they did.	- The word "so" suggests that there's some agreement with what was said previously. (Source: Bali, S7, P5)
The average temperature of the Earth's surface with the greenhouse effect is 15 degrees Celsius.	- I think "average" is an adjective as it's placed before "temperature" which is a noun. It tells what kind of temperature it is whether high or low. Definitely, it's a modifier, but I still don't know what it means. (Source: Greenhouse, S8, P7)
The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b> , " <b>The Morning of the World</b> ", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b> .	- Gunung Agung? What's this? Ah... there's the word, "Great Mountain" which precedes this name. That suggests that this "Gunung Agung" actually is the name of the Great Mountain. Also what come after it is "Bali" suggesting this Great Mountain is situated in Bali. (Source: Bali, S9, P5)

### C6 Imagination

As applied to the main study, the strategy of imagination refers to the way the readers make use of visual images to better improve their comprehension of the text. However, only one instance is found in think-aloud data.

**Table 5.44 Frequency of C6 Imagination**

Strategy	Frequency	Percentage
C6.1 Visualise information	1	0.09
<b>Total of C6:</b>	<b>1</b>	<b>0.09</b>

As the student coded as P5 was reading the sentence, her protocol revealed that she tried to relate the two phrases which are, "sun's heat" and "Earth's surface" to form a bigger picture of the Earth's orbit. The way she perceived and visualised the information was as in Table 5.45.



**Table 5.45 Student's Protocol Reflecting C6.1**

Text	Student's protocol reflecting C6.1
Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	- The words, "sun's heat" and "Earth's surface" make me think of the Earth's orbit, the characteristics of the planets and the heat which radiates from the sun to the Earth. ( Source: Greenhouse, S6, P5)

### **C7 Auditory Representation**

As can be seen from the think-aloud study, this strategy of auditory representation refers to the way the readers vocalise or sub-vocalise as they read to help make a connection between sound and meaning. The frequency is as follows:

**Table 5.46 Frequency of C7 Auditory representation**

Strategy	Frequency	Percentage
C7.1 Vocalise	140	12.67
<b>Total of C7:</b>	<b>140</b>	<b>12.67</b>

As can be seen from Table 5.46, the use of this strategy amounted to 140 instances, 12.67% from both think-aloud sessions which is considered to be of high frequency. Although students were advised to read the text in silence and think-aloud only when they come to the end of each sentence as discussed earlier in Section 3.5.3.5.3, they could not help vocalising as they read along. The use of vocalising was constantly used by some students, while absent from others. For those who used it, vocalising became integrated with other strategies as students used it while reading.

The highest frequency use of vocalising came from the male student in the control group who was coded as P8. His protocols reflected that he began to vocalise when he had problems understanding the meaning of the sentence. Sometimes he vocalised at the beginning or in the middle of the sentence as he read along.

In most cases, he combined the strategy of vocalising with C9.1 Translation into Thai which is to be discussed next in the sub-category of C9 Transfer. In his protocols in the next table, enclosed quotation marks suggest that these parts were being vocalised.



**Table 5.47 Student's protocol reflecting C7.1**

Text	Student's protocol reflecting C7.1
If the global warming trend continues, we may experience shorter, warmer winters, and longer hotter summers.	- If "global warming" remains like this, we will ... "we may experience shorter, warmer winters and longer hotter summers." (Source: Greenhouse, S25, P8)
So what can you do about global warming?	- "So what can you do about global warming?" (Source: Greenhouse, S27, P8)
The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b> , " <b>The Morning of the World</b> ", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b> .	- "The mountain was called Great Mountain – Gunung Agung" They call this mountain Gunung Agung. "...and the island is Bali, The Morning of the World,"... The definition of Bali is the Morning of the World. "...a magical island full of legends and mystical" Mystical? It suggests something mysterious... "set among the thousands of islands that are Indonesia." This island is full of mysterious tales from over thousand of years ago. (Source: Bali, S9, P8)

### C8 Elaboration

Elaboration refers to the way the readers relate new information to prior knowledge. As found in the main study, it was reflected in three different strategies which are C8.1 "activate known vocabulary", C8.2 "activate previous knowledge" and C8.3 "relate to personal experience". Their frequency rates are as follows:

**Table 5.48 Frequency of C8 Elaboration**

Strategy	Frequency	Percentage
C8.1 Activate known vocabulary	67	6.06
C8.2 Activate previous knowledge	15	1.36
C8.3 Relate to personal experience	10	0.90
<b>Total of C8:</b>	<b>92</b>	<b>8.33</b>



Out of the three strategies, C8.1 “activate known vocabulary” gained the highest frequency of all. In this strategy, the students chose to focus attention on a word or a group of words they already know in preparation for them working out the meaning of the whole sentence.

**Table 5.49 Student’s Protocol Reflecting C8.1**

Text	Student’s protocol reflecting C8.1
One of the most popular (and most dangerous) ways to get about in Bali is to take a motor bike.	- “Dangerous” suggests danger. “Most” is the highest degree. “Take a motor bike” means to ride on a motor bike. So, to ride a motor bike is dangerous. (Source: Bali, S26, P5)
If burning fossil fuels adds greenhouse gases to the atmosphere, we should find ways to use these fuels more efficiently.	- “More efficiently”. Ah. That means the same, more or less, as ‘more effectively’. (Source: Greenhouse, S29, P2)

Next, the students also made use of their academic knowledge as well as world knowledge to help them understand the content of the text through the strategy of C8.2 Activate previous knowledge. It was found in 15 instances or 1.36 per cent of overall strategies. In the study, P2’s protocols reflected a great amount of integrating his previous knowledge on ‘the ozone hole’ while reading the text on, “Did you know we live in a Greenhouse?”, which discusses the ‘greenhouse effect’. This influenced the way he interpreted the meaning of the text throughout his reading of the text as in Table 5.50.

**Table 5.50 Student’s Protocol Reflecting C8.2**

Text	Student’s protocol reflecting C8.2
Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	- The atmosphere has been accumulating the sun’s heat, and finally it has got holes in it resulting in the greenhouse effect. The plants’ greenhouse is a literal greenhouse, while the humans’ greenhouse refers to the greenhouse effect. That’s how it should go, more or less. (Source: Greenhouse, S6, P2)



<p>Destroying our forests, or <b>deforestation</b>, upsets this balance and actually results in increasing amounts of carbon dioxide in the atmosphere.</p>	<p>- It has something to do with carbon dioxide. This carbon dioxide causes a leakage in the atmosphere resulting in the greenhouse effect. (Source: Greenhouse, S22, P2)</p>
<p>The fact of the matter is that global warming could easily mean changes to our daily lives.</p>	<p>- If the air-conditioning machines produce CFC, we will have more of it spread in the atmosphere. That will increase the greenhouse effect, and the Earth will become hotter. Will it go like this? (Source: Greenhouse, S24, P2)</p>

Finally, the students also tried to personalise what they read into their own circumstances so that they were able to relate more to their own context resulting in better understanding. The label for this strategy is C8.3 “relate to personal experience”. With its frequency of 10, it showed that some students were actively involved in what they were reading.

**Table 5.51 Student’s Protocol Reflecting C8.3**

<b>Text</b>	<b>Student’s protocol reflecting C8.3</b>
<p>If the global warming trend continues, we may experience shorter, warmer winters, and longer hotter summers.</p>	<p>- We’re actually experiencing that now. Bangkok is getting hotter and hotter every year. That should be one of the global warming trends. (Source: Greenhouse, S25, P2)</p>
<p>Bemos are fun, frequent and above all, very cheap.</p>	<p>- I think it’s similar to the way we do hitchhiking when traveling here. (Source: Bali, S21, P2)</p>

## **C9 Transfer**

In relation to the L2 reading context, it refers to the way the readers draw on what they already know about language to help them understand the text. In order to understand what the text is about, the students relied primarily on translating what they read into Thai. The cognitive sub-category of C9 Transfer was highest in rank which is reflected in the frequency of 330 from both think-aloud sessions.



**Table 5.52 Frequency of C9 Transfer**

Strategy	Frequency	Percentage
C9.1 Translate into Thai	330	29.86
<b>Total of C9:</b>	<b>330</b>	<b>29.86</b>

Based on the students' protocols, the majorities used this strategy as a primary resource and would turn to other strategies only when they failed to understand the meaning of the text. In general, their translation was straightforward or word-to-word.

**Table 5.53 Student's Protocol Reflecting C9.1**

Text	Student's protocol reflecting C9.1
You probably know that flowers, fruit and vegetables can be grown in a greenhouse, but did you know that we humans also live in a greenhouse?	- What it wants to say in this sentence is that we all know that flowers, fruit, and vegetables can all be grown in this "greenhouse", but did you know that we humans can live in this "greenhouse" as well? (Source: Greenhouse, S3, P1)
Many scientists now believe that the addition of greenhouse gases from human or manmade sources is throwing our atmosphere and the natural greenhouse effect out of balance.	- Many scientists ... nowadays... many scientists believe that ... the increase of manmade gases or natural resources.... various construction sites ... these all contribute to the destruction of atmosphere ...the greenhouse effect... causing the atmosphere ...the outer atmosphere to be in imbalance. (Source: Greenhouse, S13, P8)

### **C10 Inferencing**

This last cognitive sub-category of C10, Inferencing refers to the way the readers make inferences from the text. Based on think-aloud protocols, 5 different strategies were found, which are of C10.1 "guess unknown words", C10.2 "infer overall meaning from context", C10.3 "make a prediction", C10.4 "make use of while reading" and C10.5 "identify reference". Its overall frequency came in the fourth place of cognitive sub-categories with the total frequency of 88, 7.96 per cent of overall strategy use. Detailed frequency rates of individual strategies are as follows:



**Table 5.54 Frequency of C10 Inferencing**

Strategy	Frequency	Percentage
C10.1 Guess unknown words	60	5.43
C10.2 Infer overall meaning from context	4	0.36
C10.3 Make a prediction	10	0.90
C10.4 Make use of illustrations while reading	1	0.09
C10.5 Identify reference	13	1.18
<b>Total of C10:</b>	<b>88</b>	<b>7.96</b>

Based on Table 5.54, the strategy of guessing unknown words was highest with the frequency rate of 60, 5.43 per cent of all strategies. The two Balinese words, “bemos” and “dokar”, which appeared in “Bali Travel Information”, elicited a large number of guesses as reflected in the following protocols.

**Table 5.55 Student’s Protocol Reflecting C10.1**

Text	Student’s protocol reflecting C10.1
Those looking for adventure can try the local “ <i>bemos</i> ”.	<ul style="list-style-type: none"> <li>- Perhaps the word “bemos” suggests a place where you can go traveling. (Source: Bali, S19, P2)</li> <li>- “Bemos” is a name of some sort. It might refer to people who are looking for adventure. “Bemos” should relate to the locality. (Source: Bali, S19, P3)</li> <li>- It might refer to a tourist attraction. (Source: Bali, S19, P4)</li> </ul>
For a change of pace, negotiate a “ <i>dokar</i> ” the local horse and carriage that can carry three or four passengers.	<ul style="list-style-type: none"> <li>- I think “dokar” is a type of local horse. (Source: Bali, S22, P3)</li> <li>- “Dokar” is a place where there’re lots of horses. They’re used for transport. Something like that. (Source: Bali, S22, P7)</li> </ul>

In the main study, there were 13 instances, 1.18 per cent of overall strategy use reflecting the use of making references while reading. This includes identifying what the references were as well as replacing them in the context.



**Table 5.56 Student's Protocol Reflecting C10.5**

Text	Student's protocol reflecting C10.5
They decided the answer lay in placing a mountain upon the island, to balance, and calm it.	- What are "they" here referring to? Oh, must be referring to "gods". (Source: Bali, S6, P6)
And so they did.	- Ah. And so what 'the gods' did was to recreate the island. (Source: Bali, S7, P2)

Making a prediction was another strategy used in order to predict the direction of the incoming text while reading. The frequency based from the main study was 10 and in most cases it was from the student coded as P2. Some of his protocols are in Table 5.57.

**Table 5.57 Student's Protocol Reflecting C10.3**

Text	Student's protocol reflecting C10.3
But be warned.	- Ah, what kind of warning could it be about? Perhaps about how the bike might easily cause accidents. (Source: Bali, S28, P2)
The fact of the matter is that global warming could easily mean changes to our daily lives.	- Let me think. My guess would be about how we used less air-conditioning in the past, but we use it more now as it's getting hotter. (Source: Greenhouse, S24, P2)

The last two strategies in this sub-category are C10.2 "infer overall meaning from context" and C10.4 "make use of illustrations while reading". The first strategy refers to the way the readers make inferences, while the second one is the way the readers make use of illustrations while reading. However, both strategies gained a low frequency rate of 4 and 1 which are equivalent to 0.36 per cent and 0.09 per cent of overall strategy use respectively.



### 5.1.4.1.3 Summary of Types and Frequency of Reading Strategies Employed by the Eight Students in the Main Study

After all of the 32 strategies which come under the headings of both metacognitive and cognitive sub-categories have been discussed in Sections 5.1.4.1.1 and 5.1.4.1.2 together with their subsequent protocols, their rankings will now be presented in this section to give a summary of how they were distributed in the main study. In order to do this, all strategies were listed and sorted from the most frequently to the least frequently used. The figures are presented in both frequency and percentage.

**Table 5.58 Rankings of Metacognitive and Cognitive Strategies**

Ranking order	Reading strategy	Frequency	Percentage
1	C9.1 Translate into Thai	330	29.86
2	C7.1 Vocalise	140	12.67
3	M4.2 Identify the source of reading problems	85	7.69
4	C8.1 Activate known vocabulary	67	6.06
5	C10.1 Guess unknown words	60	5.43
6	M4.4 Verify one's understanding of the text	38	3.44
7	M4.3 Asking for information about the text	37	3.35
8	C1.1 Look up in dictionary	37	3.35
9	M1.1 Guess from title or sub-title	30	2.71
10	M4.1 Recognise reading problems one's having	30	2.71
11	M4.7 Integrate information with previous sentence	28	2.53
12	M4.8 Talk to the text	27	2.44
13	M3.2 Pay attention to the use of punctuation marks	24	2.17
14	C5.1 Apply known rules	22	1.99
15	M3.3 Skip to the next sentence	21	1.9
16	M3.1 Pay attention to key words	19	1.72
17	C8.2 Activate previous knowledge	15	1.36
18	M1.2 Preview the text	13	1.18
19	C10.5 Identify reference	13	1.18
20	C1.2 Fit meaning into context	10	0.9
21	C8.3 Relate to personal experience	10	0.9
22	C10.3 Make a prediction	10	0.9
23	M4.5 Check one's understanding of the text	6	0.54



24	M4.6 Correct one's understanding of the text	5	0.45
25	M4.10 Continue reading	5	0.45
26	M4.11 Reread	5	0.45
27	C4.1 Summarise the content read	5	0.45
28	M4.9 Read ahead	4	0.36
29	C10.2 Infer overall meaning from context	4	0.36
30	C2.1 Make use of grouping	3	0.27
31	C6.1 Visualise information	1	0.09
32	C10.4 Make use of illustrations while reading	1	0.09
<b>Total</b>		<b>1105</b>	<b>100</b>

According to Table 5.58, the overall rankings show that the most frequent strategies used were used for decoding the meaning of the text. Based on the frequency rate, the students tried to grasp the meaning of the text by translating what they were reading into Thai. This resulted in 330 uses of the strategy of C9.1 Translate into Thai which was equivalent to 29.86 per cent of total strategy use. Some students connected the sound with meaning to help understand what they were reading. This strategy was labelled as C7.1 “vocalise” in the main study. It came second in the ranking and gained the frequency of 140, 12.67 per cent of all strategies.

The students’ protocols showed that they were aware of the reading problems they were having. After they tried to identify what hindered their understanding of the text using the strategy of M4.2 “identify the source of reading problems” (85, 7.69 per cent), they then coped with the problems accordingly.

It can be said that the major problems the students had while thinking-aloud, derived from difficult vocabulary. Some of the strategies they used to handle the unknown words were reflected in 3 strategies which were C8.1 “activate known vocabulary”, 67, 6.06 per cent, C10.1 “guess unknown words” 60, 5.43 per cent and C1.1 “look up in dictionary”, 37, 3.35 per cent. This reveals the students tended to work out the meaning by making use of the vocabulary they already knew first. If they still could not work it out, then guessing the unknown words from context would be the next step they took, and the students would use checking the meaning of words in the dictionary as a last resource. While doing so, they also constantly checked the meaning to see if it fit with the context through the strategy of M4.4 “verify one’s understanding of the text”, 38, 3.44 per cent as well as M4.3 “asking for information about the text”, 37, 3.35 per cent of overall strategy use.



Although the students focused more on working out the meaning of words they found problematic, they did not use some of the following strategies so frequently to help them guess the meaning of the unknown words. Some of them were, C6.1 “visualise information”, C2.1 “make use of grouping” and C10.2 “infer overall meaning from context”. Moreover, the frequency rates of M4.5 “checking one’s understanding of the text”, M4.6 “correct one’s understanding of the text” as well as C4.1 “summarising the content they read” were also found to be low in use.

#### **5.1.4.2 A Comparison of Reading Strategies Employed Between High- and Low- Proficiency Students**

In the previous section, the overall types and frequency rates of reading strategies were discussed which helps to reveal that the students used a variety of strategies from both metacognitive and cognitive categories. However, data were presented without addressing or making a generalisation about the use of the particular types of strategies in relation to a particular group of students.

In answering research question 2, the discussion in this section aims to look at the reading strategies as employed between the two groups of students at different levels of proficiency, more proficient and less proficient which will sometimes be referred to as ‘high’ and ‘low’ in abbreviated form for convenience. With reference to Table 5.1 and the criteria specified in the same section, the students who were coded as P1, P2, P5 and P6 are classified as more proficient readers, while the less proficient ones are referred to as those coded P3, P4, P7 and P8.

The following discussion will be based on the same think-aloud data as appeared in Appendix J.1. In the first section of 5.1.4.2.1 the overall frequency of strategy use in both groups will be discussed. The strategies employed by more proficient and less proficient readers will be presented in Sections 5.1.4.2.2 and 5.1.4.2.3 respectively.

##### **5.1.4.2.1 Overall Frequency of High- and Low-Proficiency Readers**

Based on Appendix J.1, there were 1,105 instances of reading strategies drawn from the eight students. However, after the students were divided according to the level of their proficiency, it was found that more proficient readers reported more instances at a slightly higher level of 577 when compared to 528 instances as found in the less



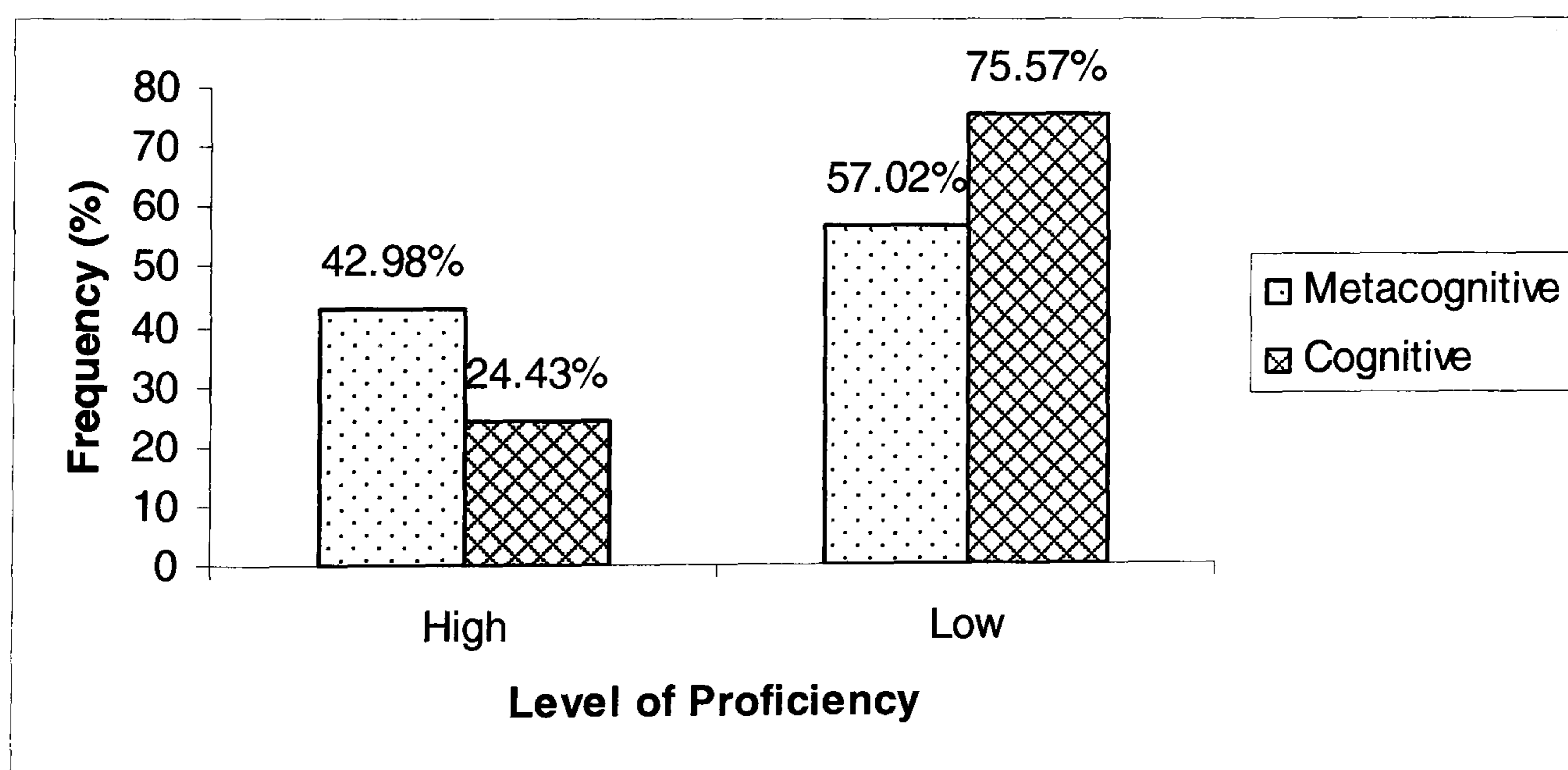
proficient group. The total frequency rates of the strategies between two groups that come under the headings of both categories can be summarised in the next table.

**Table 5.59 Overall Frequency of Categorical Strategies Used by High and Low Level Readers**

Category	High		Low	
	Frequency	Percentage	Frequency	Percentage
Metacognitive strategy	248	42.98	129	24.43
Cognitive strategy	329	57.02	399	75.57
<b>Total</b>	<b>577</b>	<b>100</b>	<b>528</b>	<b>100</b>

Table 5.59 shows cognitive strategies were employed at a higher rate than metacognitive strategies although to a different degree in both groups. As can be seen from the table, the frequency of cognitive strategies was reported at 75.75 per cent among the less proficient group, while it was reported at 57.02 per cent among the more proficient readers. As a result, the number of metacognitive strategies was reported at a much higher level among more proficient readers as can also be seen in the following figure.

**Figure 5.6 Overall Frequency of Categorical Strategies Used by High and Low Level Readers**



Based on Figure 5.6, it can be stated that the proficient readers in the main study reported more frequent use of metacognitive strategies, 42.98 per cent of total strategy use, while 24.43 per cent was reported by the less proficient group. The breakdown of reading strategies according to their categorical and sub-categorical types between the two groups will be presented in the next table.



**Table 5.60 Overall Frequency of Sub-Categorical Strategies Used by High and Low Level Readers**

Sub-category	High		Low	
	Frequency	Percentage	Frequency	Percentage
M1 Advance organisation	26	4.51	17	3.22
M3 Selective attention	45	7.8	19	3.6
M4 Self-monitoring	177	30.68	93	17.61
C1 Resourcing	3	0.52	44	8.33
C2 Grouping	3	0.52	0	0
C4 Summarising	1	0.17	4	0.76
C5 Deduction	14	2.43	8	1.52
C6 Imagination	1	0.17	0	0
C7 Auditory representation	66	11.44	74	14.02
C8 Elaboration	69	11.96	23	4.36
C9 Transfer	122	21.14	208	39.39
C10 Inferencing	50	8.67	38	7.2
<b>Total:</b>	<b>577</b>	<b>100.01</b>	<b>528</b>	<b>100.01</b>

\* Totals do not equal 100 because of rounding off.

According to Table 5.60, the number in frequency rates between high and low groups shows major differences in some sub-categories, while these differences are small in others. In order to bring out and present the differences more clearly, each set of frequency rates between the two groups were calculated and only those pairs that show major differences in figures will be discussed in the next two sections. The strategies employed at a higher rate by the more proficient students will now be discussed in the next section.

#### **5.1.4.2.2 Strategies Employed by High-Proficiency Readers**

In most sub-categorical strategies, the comparison of frequency rates showed that the group of more proficient readers employed reading strategies more frequently than the other group. The differences found in eight sub-categories of M1 Advance organisation, M3 Selective attention, M4 Self-monitoring, C2 Grouping, C5 Deduction, C6 Imagination, C8 Elaboration and C10 Inferencing.



However, the highest strategy use was found among the three sub-categories of M4 Self-monitoring, C8 Elaboration and M3 Selective attention which is reflected in the differences of 84, 46 and 26 respectively. Each of these will be further discussed together with their appropriate protocols in the next section.

### M4 Self-Monitoring

Based on the think-aloud data, the difference of 84 (high = 177, low = 93) makes M4 Self-monitoring the highest sub-category employed by the more proficient readers. For example, in the process of decoding the meaning of the text, a male student coded as P6 employed a variety of strategies that come in this sub-category quite extensively. This was supported by the fact that 4 out of 6 instances in his following protocols belonged to M4 sub-categorical strategies. According to the particular set of think-aloud protocols, he first asked about the information presented in the text (M4.3) as he was not sure about the function of the word 'peopled' in the way it appeared in the text. In order to solve this problem, he reread (M4.11) the first half of the text and guessed its possible meaning. Then, as he continued reading, he realised he had difficulties understanding the meaning of 'exposed' (M4.2), and attempted to draw an overall meaning of the unknown word within the context while verifying his general understanding of the text (M4.4).

**Table 5.61 P6's Protocols Reflecting M4 Self-Monitoring**

Text	Student's protocol	Code
Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.	- Don't understand "is peopled by". Why there's an 'ed' ending?	- M4.3 Asking for information about the text
	- I think I'd better read again.	- M4.11 Reread
	- I guess "is peopled by" means something like, "people start to move in".	- C10.1 Guess unknown words
	- And here... located to the east of Java ... across certain narrow Straits of Bali... The island is occupied by the Balinese who "are more exposed to..."	- C9.1 Translate into Thai



	<ul style="list-style-type: none"> <li>- Don't understand what "exposed" here means.</li> <li>- Maybe it goes somehow like this... the Balinese... they welcome the tourists or they treat these tourists a bit more than the rest of other Indonesians themselves ... Maybe the Balinese are more friendly to the tourists. (Source: Bali, S13, P6)</li> </ul>	<ul style="list-style-type: none"> <li>- M4.2 Identify the source of reading problems</li> <li>- M4.4 Verify one's understanding of the text</li> </ul>
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When the same sentence was read by a weaker student coded as P8, there were 2 instances of M4.2 in which he tried to identify the source of reading problems. However, after he realised the text was too difficult for him to understand, he finally decided to move on to the next sentence (M3.3).

**Table 5.62 P8's Protocols Reflecting M4 Self-Monitoring**

<b>Text</b>	<b>Student's protocol</b>	<b>Code</b>
Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.	<ul style="list-style-type: none"> <li>- "Located near the eastern-most tip of Java island across the narrow Straits of Bali, ... across the narrow Straits of Bali, ... Located near the eastern-most tip of Java ...</li> <li>- I don't really understand what is said here.</li> <li>- I should read what comes later after the comma. Maybe it will help to explain what was said previously.</li> <li>- So it says, "this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia."</li> </ul>	<ul style="list-style-type: none"> <li>- C7.1 Vocalise</li> <li>- M4.2 Identify the source of reading problems</li> <li>- M3.2 Pay attention to the use of punctuation marks</li> <li>- C7.1 Vocalise</li> </ul>



	<ul style="list-style-type: none"> <li>- It means something like ... this 'Isle of Gods' is introduced by the Balinese to western tourists... more than people who live in other parts of Indonesia do.</li> <li>- "Across the narrow Straits of Bali. It's a modifier. "The narrow Straits of Bali". I'm most confused with this.</li> <li>- I think I'd better skip it. (Source: Bali, S13, P8)</li> </ul>	<ul style="list-style-type: none"> <li>- C9.1 Translate in Thai</li> <li>- M4.2 Identify the source of reading problems</li> <li>- M3.3 Skip to the next sentence</li> </ul>
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### C8 Elaboration

This sub-category of C8 Elaboration resulted in the differences of 46 (high = 69, low = 23). The students made use of C8 when they relate the content of the text which they are reading to their own experience. This can be done in a number of ways. They sometimes try to work out the meaning of the words they know (C8.1), make use of their prior knowledge (C8.2), or relate the events in the text to what they know of the subject (C8.3).

Based on the following protocols quoted from the text on 'Bali Travel Information', it shows that more proficient readers, coded as P2 and P5, tried to make use of their knowledge of vocabulary (C8.1) or their past experience (C8.2) to help them understand the text better while reading.

**Table 5.63 P2's Protocols Reflecting C8 Elaboration**

Text	Student's protocol	Code
The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b> , " <b>The Morning of the World</b> ", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b> .	- "...morning of the world..." "...magical island..." Oh. Oh. It says here that Indonesia consists of thousand islands. But from what I remember in my schooldays, doesn't it have more than 3,000 islands? (Source: Bali, S9, P2)	C8.2 Activate previous knowledge
	- The words 'legends' and 'tale' carry more or less the same meaning. (Source: Bali, S9, P2)	C8.1 Activate known vocabulary



However, the use of activating prior knowledge was rarely found among less proficient readers. A less proficient reader coded as P7 admitted she did not have enough background knowledge in a related area while identifying it as a problem that hinders her comprehension of the text.

**Table 5.64 P7's Protocols Reflecting Lack of C8 Elaboration**

Text	Student's protocol	Code
The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b> , " <b>The Morning of the World</b> ", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b> .	- The mountain was referred to as 'Great Mountain'. It's got its local name as well. I've got to admit that I don't seem to have much knowledge about islands. I also don't know what 'mystical' means. (Source: Bali, S9, P7)	M4.2 Identify a problem in understanding text

The use of C8.3 "relate to personal experience" is reflected in a number of protocols from P2 and P5. This suggests that while reading, these two efficient readers tried to use their past experience to make the context more understandable so they could relate more to the message of the text. However, similar use of this type of strategy was not found in any protocols among less proficient readers. P2's and P5's protocols are quoted as follows:

**Table 5.65 High Students' Protocols Reflecting C8.3**

Text	Student's protocol	Code
Arm yourself with a map and trusty guide book and head off in a hotel taxi, a hire car with or without a driver, or motor bike.	- It also reminds me of the fact that western tourists don't tend to book their trip through a travel agency. From what I can see around here, they like to come as backpackers, going around by themselves and their guide book. Unlike Chinese tourists who prefer to come in a big coach with their own tour guide. (Source: Bali, S16, P5)	C8.3 Relate to personal experience



Bemos are fun, frequent and above all, very cheap.	- I think it's similar to the way we do hitchhiking when traveling here. (Source: Bali, S21, P2)	C8.3 Relate to personal experience
Their harness bells jingle as they make their colourful way through the streets.	I think the streets are as colourful and lively as what you can see along Khao San Road [a haven for foreign backpackers in Bangkok]. (Source: Bali, S24, P5)	C8.3 Relate to personal experience

### M3 Selective Attention

This is the last metacognitive sub-category that had the difference of 26 instances between the two groups of readers (high = 45, low = 19). In brief, selective attention refers to the way readers choose to focus on some key words (M3.1) or pay attention to some punctuation marks as found in the text (M3.2). Moreover, it also includes ignoring some difficult or unimportant words (M3.3). Based from the main study, the students classified as more proficient readers used more strategies in this sub-category. Examples from good readers' protocols reflecting the use of M3.1, M3.2 and M3.3 are as follows:

**Table 5.66 High students' Protocols Reflecting M3 Selective Attention**

Text	Student's protocol	Code
The average temperature of the Earth's surface with the greenhouse effect is 15 degrees Celsius.	- "Cel::sius::". "Fifteen degrees Celsius". (Source: Greenhouse, S8, P2)	M3.1 Pay attention to key words
It may be as simple as sharing the information you learned in this paper with your neighbours and friends it's a start!!	- There's an exclamation mark suggesting an emphasis. (Source: Greenhouse, S32, P5)	M3.2 Pay attention to the use of punctuation marks
The friendly Balinese love to stop for a chat, and a bicycle is just the right speed.	- Might as well skip it. Anything I don't know or can't translate it; I will just skip it. (Source: Bali, S33, P1)	M3.3 Skip to the next sentence



Based on the strategy of M3.3 “skip to the next sentence” which is also within the same sub-category, think-aloud protocols showed that more proficient readers were more tolerant when dealing with unknown or difficult words. In most cases, they either guessed from context or ignored them and moved on to read the next sentence (M3.3), while less proficient readers felt the need to deal with them straight away.

In the following two sets of protocols, it showed different strategies employed by a good reader, coded as P1, and a weaker reader, coded as P3, as they were reading the same sentence based on the text, “Bali Travel Information”.

**Table 5.67 P1’s protocols reflecting M3 Selective attention**

Text	Student’s protocol	Code
Their harness bells jingle as they make their colourful way through the streets.	- Don’t understand this.	M4.1 Recognise reading problems one’s having
	- Better skip. (Source: Bali, S 24, P1)	M3.3 Skip to the next sentence
Drivers need a valid International Driver's License and helmets are compulsory.	- “...and helmets ... helmets are compulsory”... I don’t understand this.	M4.1 Recognise reading problems one’s having
	- Will just skip it. (Source: Greenhouse, S31, P1)	M3.3 Skip to the next sentence

**Table 5.68 P3’s Protocols Reflecting Lack of M3 Selective Attention**

Text	Student’s protocol	Code
Their harness bells jingle as they make their colourful way through the streets.	- “Their harness bells jingle...” means .... I think I’d better look the word ‘jingle’ in the dictionary. (Source: Bali, S24, P3)	C1.1 Looking in dictionary
Drivers need a valid International Driver's License and helmets are compulsory.	- I need to look up in the dictionary as there’re two words I don’t know here which are, ‘helmets’ and ‘compulsory’. (Source: Greenhouse, S31, P3)	C1.1 Looking in dictionary



### 5.1.4.2.3 Strategies Employed by Low-Proficiency Readers

As discussed in the previous section that more proficient readers used more variety in types of strategies, the opposite is true for the less proficient ones. After the difference in frequency rate of the two groups was calculated and compared, there were 4 sub-categorical strategies that were used more often by weaker readers. These were: C9 Transfer, C1 Resourcing, C7 Auditory representation and C4 Summarizing.

In relation to the difference in frequency between the two groups, only the first two sub-categories of C9 and C1 gained large differences of 86 and 41 respectively, while the differences among the last two strategies of C7 and C4 were 8 and 3 respectively. The sub-categories of C9, C1 and C7 will be discussed supported by their appropriate protocols.

#### C9 Transfer

In the main study, the use of C9 Transfer was reported in both groups although it was relatively much higher in the less proficient group with the frequency of 208 against 122 resulting in the differences of 86.

In relation to the data, P8 reported the highest use of this strategy. This was reflected in one of his protocols as he was identifying his reading problems as not being able to read and being unable to translate.

**Table 5.69 P8's Protocols Reflecting Reading Problems**

Text	Student's protocol	Code
Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	- I can't read this sentence. I mean I can't translate it. (Source: Greenhouse, S6, P8)	M4.2 Identify the source of reading problems

It was the same sentence P7 used which also further explained about the way she made use of C9.1.



**Table 5.70 P7's Protocols Reflecting C9 Transfer**

<b>Text</b>	<b>Student's protocol</b>	<b>Code</b>
Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	<ul style="list-style-type: none"> <li>- It means something like the Earth orbits around the sun and absorbs the sun's heat.</li> <li>- When I translate... I don't ... sort of... When I read, I can't actually translate every single word as I don't know all of them. I only choose to translate what stands out most.</li> </ul> (Source: Greenhouse, S6, P7)	C9.1 Translate into Thai

One of the protocols from a less proficient reader, coded as P4, revealed some of the difficulties he had in expressing the ideas in words.

**Table 5.71 P7's Protocols Reflecting Reading Problems**

<b>Text</b>	<b>Student's protocol</b>	<b>Code</b>
If the global warming trend continues, we may experience shorter, warmer winters, and longer hotter summers.	<ul style="list-style-type: none"> <li>- 'shorter, warmer winters and longer hotter summers' I don't know what they are doing here. I know what they all mean, but can't put them altogether in words. (Source: Greenhouse, S25, P4)</li> </ul>	M4.2 Identify the source of reading problems

Although weak readers tended to do a lot of translation while reading, their translated protocols were sometimes incomplete and contained mistakes due to their misinterpretations of words or expressions.

**Table 5.72 Low Students' Protocols Reflecting Mistakes in Their Translation**

<b>Text</b>	<b>Student's protocol</b>	<b>Code</b>
Did you know we live in a Greenhouse?	<ul style="list-style-type: none"> <li>- What do you think of a 'greenhouse'? (Source: Greenhouse, S1, P4)</li> </ul>	- C9.1 Translate into Thai
For hundreds of years the Earth's atmosphere has changed very little.	<ul style="list-style-type: none"> <li>- Every one hundred year the Earth's atmosphere keeps changing a little. (Source: Greenhouse, S11, P8)</li> </ul>	C9.1 Translate into Thai



Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about.	- And then... when you travel, you can look around you or something like that... along the side. (Source: Bali, S29, P7)	C9.1 Translate into Thai
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### C1 Resourcing

The second highest sub-category among the lower group of readers is C1 Resourcing. Although the students were allowed to use reference materials (i.e., a dictionary), 3 out of 8 students actually used a dictionary while reading. There were 3 instances of dictionary use from P2 who was coded as a proficient reader, and the rest of the 44 instances were distributed among the two female less proficient readers. This resulted in the difference of 41 between the two groups of readers.

Both P3 and P7 looked words up in a dictionary (C1.1) frequently and consulted with it as their first resource when experiencing unknown or difficult words. In one of the protocols by P3, it showed how frequently she used this strategy in order to check the meanings of the words that were unfamiliar to her. Out of the total of 7 instances of strategy use, she looked up 3 words in the dictionary including: 'fertile', 'plains' and 'unsteady'.

**Table 5.73 P3's Protocols Reflecting C1.1**

Text	Student's protocol	Code
It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	- It's beautiful. It's a beautiful island.	C9.1 Translate into Thai
	- 'Fertile?' Don't know what it means.	M4.2 Identify the source of reading problems
	- Will look it up in the dictionary. Oh, it means 'abundant'. [after looking the word up in the dictionary]	C1.1 Look up in dictionary
	- 'Plains?' [while looking the word up in the dictionary]	C1.1 Look up in dictionary



	<ul style="list-style-type: none"> <li>- 'Shores rocked?' Maybe it has to do with rocks or mountains.</li> <li>- Umm. "Unsteady..." [while looking up in the dictionary]</li> <li>- As from the beginning, 'fertile...fertile' means abundant, but the plains... and the mountains along the plains are not steady. Maybe it has something to do with earthquakes so that's why its plains are not so steady. (Source: Bali, S4, P3)</li> </ul>	<p>C10.1 Guess unknown words</p> <p>C1.1 Look up in dictionary</p> <p>M4.4 Verify one's understanding of the text</p>
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Although a dictionary may be helpful to low-proficiency readers, failure in fitting meaning into context results in not fully comprehending the text. When the think-aloud report took place, there were two types of dictionary for the students to choose from, monolingual (English-English) and bilingual (English-Thai). Regardless of their proficiency backgrounds, all students went for a bilingual dictionary. In general, a bilingual dictionary provides a limited range of word meanings with no accompanying contexts. As a result, weaker students showed some difficulties in working out the meaning from the context (C1.2).

In the following protocols by P3, she looked up the two words (C1.1) of 'across' and 'tip' while trying to figure out their meanings in the particular context (C1.2). Her protocols reflected her difficulties and showed that she was filled with uncertainty about what these two words meant in the context.

**Table 5.74 P3's Protocols Reflecting C1.2**

Text	Student's protocol	Code
<p>Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.</p>	<ul style="list-style-type: none"> <li>- Across? (while looking up in the dictionary)</li> <li>- Tip? (while looking up in the dictionary)</li> </ul>	<p>C1.1 Look up in dictionary</p> <p>C1.1 Look up in dictionary</p>



	<p>- At first, I wasn't too sure about what 'across' means. But after looking up in the dictionary, I've found out it means 'cross', and it confuses me more. Maybe it means 'near'. As for the word 'tip', the dictionary says it refers to 'needle point'. Does it mean the same as the 'edge' of Java? (Source: Bali, S13, P3)</p>	C1.2 Fit meaning into context
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The same sentence created a problem for P7 in the same way. In the following protocols, she started off by looking up 'narrow' and 'exposed' (C1.1) and managed to read on after figuring out the meanings of both words. However, she failed to understand its interpretative meaning as embedded in the corresponding context.

**Table 5.75 P7's Protocols Reflecting C1.1 And C1.2**

Text	Student's protocol	Code
<p>Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.</p>	<p>- So, 'narrow' means 'confine' [after looking the word up in the dictionary].</p> <p>- The Balinese are friendly... friendly to the tourists. 'Exposed?' [while looking up the word in the dictionary]</p> <p>- They're friendly and open to the tourists.</p> <p>- But here it says, "than many people..." I... I don't understand how they can be friendlier than other Indonesians. (Source: Bali, S13, P7)</p>	<p>C1.1 Look up in dictionary</p> <p>C1.1 Look up in dictionary</p> <p>C1.2 Fit meaning into context</p> <p>M4.2 Identify the source of reading problems</p>



## C7 Auditory Representation

The last sub-category to be discussed is C7 Auditory representation which consists of C7.1 Vocalise. Although the difference between the two groups was not substantially high (low = 74, high = 66), there were some distinctive features of how this strategy was used among low-proficiency readers. This strategy was used predominantly by two male students, coded as P4 and P8. Generally, this strategy was integrated into the process of their reading by the two groups of readers as they occasionally vocalised when they found the text difficult to understand. The amount of verbalisation depended on the individual.

Based on the protocol data, P7 sometimes repeated the whole sentence, part of the sentence or certain words to help him relate meaning with sound. All of his protocols in quotation marks suggested that they were taken straight from the text.

**Table 5.76 P7's Protocols Reflecting C7 Auditory Representation**

Text	Student's protocol	Code
<p>Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about.</p>	<p>- "Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about." Many westerners are not prepared for the ... 'chaos' 'cha::os' ... 'cha::os'. This word seems so familiar. "... chaos of Balinese roads and drivers have to watch for everything while zooming about."</p>	<p>C7.1 Vocalise</p>
	<p>- I'd better look at what comes after 'and' first as it may agree with what was said in the earlier part.</p>	<p>C5.1 Apply known rules</p>
	<p>- "...and drivers have to watch for everything while zooming about."</p>	<p>C7.1 Vocalise</p>
	<p>- And the drivers have to watch everything while they're at that spot.</p>	<p>C9.1 Translate into Thai</p>



	<ul style="list-style-type: none"> <li>- “Many westerners are not prepared for the seeming chaos of Balinese roads ...”</li> <li>- I think I’ll skip it. I’ll skip this square. [as appeared in the reading text] (Source: Bali, S29, P8)</li> </ul>	<p>C7.1 Vocalise</p> <p>M3.3 Skip to the next sentence</p>
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Although the think-aloud verbal report is different from another type of data collection which is known as miscue analysis in which learners are asked to read aloud and their miscues are analysed, some of the students’ protocols also contained a feature of mispronunciations when they verbalised. Their mispronunciations also had an adverse effect on how they perceived the meaning of the text.

As found in the main study, the male student coded as P4 mispronounced the words of ‘century’ for ‘country’ and ‘global warming’ for ‘global warning’. He then went on to mistranslate the words when he read them. In the end, he admitted he could not make sense of the text.

**Table 5.77 P4’s Protocols Reflecting Mispronunciation of Words**

<b>Text</b>	<b>Student’s protocol</b>	<b>Code</b>
We are surrounded by a blanket of air called the atmosphere which has kept the temperature on Earth just right for centuries.	- Does it mean ‘the atmosphere’ has kept the temperature of a ‘country’... the temperature of one country? (Source: Greenhouse, S5, P4)	C9.1 Translate into Thai
The Greenhouse Effect and Global Warming	<ul style="list-style-type: none"> <li>- The Greenhouse Effect and Global ‘Warning’.</li> <li>- ‘Global?’ I don’t know what it means.</li> <li>- A warning related to ‘global’. I think this global thing might refer to an organisation. It’s a, sort of, warning. (Source: S10, P4)</li> </ul>	<p>C7.1 Vocalise</p> <p>M4.2 Identify the source of reading problems</p> <p>C10.1 Guess unknown words</p>



This is known as global warming.	<ul style="list-style-type: none"> <li>- This is known as global 'warning'.</li> <li>- Does it mean the government is trying to give a warning?</li> <li>- I'm confused. Maybe I've just made this up. [laugh] (Source: Greenhouse, S15, P4)</li> </ul>	<p>C7.1 Vocalise</p> <p>C9.1 Translate into Thai</p> <p>M4.1 Recognise reading problems one's having</p>
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### 5.1.4.3 A Comparison of the Reading Strategies Used over Time Between Both Groups

In the previous two sections, the think-aloud results were discussed in relation to the overall types and frequency rates of reading strategies as generally used by the 8 students in the main study and as typically used according to the level of their reading proficiency which was high or low.

In this section, in relation to research question 3, the discussion is based on comparing the frequency rates of reading strategies used pre- and post- instructional periods between the experimental and control groups. The breakdowns of the overall types and frequency rates of both texts, 'Greenhouse' and 'Bali', can be found in Appendices J.2 and J.3 respectively. The data concerning the strategies used by the students in the experimental group is discussed in Section 5.1.4.3.1, whereas Section 5.1.4.3.2 involves the control group. Finally, the summary of the reading strategies used by both groups is discussed in Section 5.1.4.3.3.

#### 5.1.4.3.1 The Experimental Group

With reference to Table 5.1, there were 4 students in the experimental group who were coded as P1, P2, P3 and P4. In the following discussion, they are referred to as the experimental group regardless of the differences in their proficiency backgrounds.



Based on the raw data presented in Appendices J.2 and J.3, the total of their strategies used before- and after- instructional periods can be summed up and presented in the following table.

With reference to Table 5.78, the overall frequency of strategy use among the students in the experimental group showed some improvement reflecting in the difference of 23 (Greenhouse = 271, Bali = 294). However, there was a decline in its use in some students (i.e., P1 and P4), while an increase in others (i.e., P2 and P3).

**Table 5.78 Individual Frequency of Strategy Use: Experimental Group**

Student's code	Frequency of Strategy		Total
	Greenhouse	Bali	
P1	72	65	137
P2	72	83	155
P3	51	79	130
P4	76	67	143
<b>Total</b>	<b>271</b>	<b>294</b>	<b>565</b>

Based on Table 5.78, the difference between pre- and post- think-aloud reports clearly indicates that the students coded as P3 and P2 used reading strategies more frequently in their post-report, 28 and 11 instances respectively, while P4 and P1 showed a small decline of 9 and 7 respectively.

A more detailed summary of the distribution of types and frequency rates of reading strategies as used by the students in the experimental group is presented in the next table. The data in Table 5.79 has derived from adding up all the frequency rates as found from both texts in Appendix J.2 and J.3.

**Table 5.79 Distribution of Sub-Categories and Frequency Rates of Reading Strategies: Experimental Group**

Sub-category	Greenhouse		Bali	
	Frequency	Percentage	Frequency	Percentage
M1 Advance Organisation	10	3.69	16	5.44
M3 Selective Attention	14	5.17	12	4.08
M4 Self-monitoring	72	26.57	63	21.43
C1 Resourcing	7	2.58	22	7.48
C2 Grouping	1	0.37	0	0.00



C4 Summarising	2	0.74	1	0.34
C5 Deduction	1	0.37	8	2.72
C6 Imagination	0	0.00	0	0.00
C7 Auditory representation	37	13.65	44	14.97
C8 Elaboration	18	6.64	19	6.46
C9 Transfer	90	33.21	78	26.53
C10 Inferencing	19	7.01	31	10.54
<b>Total</b>	<b>271</b>	<b>100.00</b>	<b>294</b>	<b>100.00</b>

In general, the differences in metacognitive and cognitive sub-categories as found in both think-aloud reports vary between a maximum decrease of 12 to an increase of 15 among all the four students.

In metacognitive sub-categories, it was only in M1 Advance organisation that the students reported more of its use by 6 instances (Greenhouse = 10, Bali = 16), while both sub-categories of M4 Self-monitoring and M3 Selective attention showed a decline of 9 and 2 respectively. Most of the strategies in cognitive sub-categories were used at a higher rate. Some of which include C1 Resourcing, C10 Inferencing, C7 Auditory representation and C5 Deduction with the gain of 15, 12, 7 and 7 respectively. However, a few sub-categories were used less frequently which include C9 Transfer and C4 Summarising, resulting in a decrease of 12 and 1 respectively.

In order to give an overview of strategy use, the same data is added up and presented next under the main category it belongs to, metacognitive or cognitive.

**Table 5.80 Overall Frequency of Metacognitive and Cognitive Categories: Experimental Group**

Category	Greenhouse		Bali	
	Frequency	Percentage	Frequency	Percentage
Metacognitive	96	35.42	91	30.95
Cognitive	175	64.58	203	69.05
<b>Total</b>	<b>271</b>	<b>100</b>	<b>294</b>	<b>100</b>

From both think-aloud sessions, there were 565 instances in total, 271 from the text on 'Greenhouse', and 296 from 'Bali', resulting in the difference of 23 between the two groups as discussed earlier.



However, after the strategies are investigated according to their assigned categories, data shows that there was a small decrease of 5 in the metacognitive category (Greenhouse = 96, Bali = 91), whereas there was a major increase of 28 in the cognitive category (Greenhouse = 175, Bali = 203). Data from the control group will be discussed in the next section before comparison between the two groups is made in the later section.

#### 5.1.4.3.2 The Control Group

The data from P5, P6, P7 and P8 is used to represent the control group as a whole. Based on Table 5.81, the overall frequency of their strategy use in both texts also shows an improvement of 32 (Greenhouse = 254, Bali = 286).

**Table 5.81 Individual Frequency of Strategies Use: Control Group**

Student's code	Frequency of Strategy		Total
	Greenhouse	Bali	
P5	90	73	163
P6	48	74	122
P7	58	60	118
P8	58	79	137
<b>Total</b>	<b>254</b>	<b>286</b>	<b>540</b>

In relation to individual improvement in strategy use, P6, P7, and P8 reported higher frequency rates in the use of strategies in their second think-aloud verbal reports. This is reflected in the differences of 26, 2 and 21 respectively. The only figure which declined came from P5 whose frequency dropped sharply by 17 (Greenhouse = 90, Bali = 73). The distribution of types and frequency rates of reading strategies as found in individual metacognitive and cognitive sub-categories is added up and presented in the next table.



**Table 5.82 Distribution of Sub-Categories and Frequency Rates of Reading Strategies: Control Group**

Sub-category	Greenhouse		Bali	
	Frequency	Percentage	Frequency	Percentage
M1 Advance Organisation	7	2.76	10	3.50
M3 Selective Attention	23	9.06	15	5.24
M4 Self-monitoring	56	22.05	79	27.62
C1 Resourcing	4	1.57	14	4.90
C2 Grouping	1	0.39	1	0.35
C4 Summarising	0	0.00	2	0.70
C5 Deduction	2	0.79	11	3.85
C6 Imagination	1	0.39	0	0.00
C7 Auditory representation	27	10.63	32	11.19
C8 Elaboration	29	11.42	26	9.09
C9 Transfer	88	34.65	74	25.87
C10 Inferencing	16	6.30	22	7.69
<b>Total</b>	<b>254</b>	<b>100.00</b>	<b>286</b>	<b>100.00</b>

Among all of the four students in the control group, the differences in frequency rates between the first and the second think-aloud verbal reports on 'Greenhouse' and 'Bali' are in the range of a maximum decrease of 14 to an increase of 10.

In the area of metacognitive sub-categories, both the sub-categories of M1 Advance organisation and M4 Selective attention were used at a higher rate. The sub-category of M4 was used at a higher frequency by 23 instances (Greenhouse = 56, Bali = 79), while a small improvement was made to M1 with 3 more instances (Greenhouse = 7, Bali = 10).

In the post-think-aloud report, the students in the control group used cognitive strategies more frequently than metacognitive ones. This is reflected in some of the sub-categories including: C1 Resourcing, C5 Deduction, C10 Inferencing, and C7 with higher differences of 10, 9, 6 and 5 respectively. Some of the strategies found in the sub-categories of C9 Transfer and C8 Elaboration were used less frequently which resulted in a decline of 14 and 3 respectively.

The overview of strategies presented in relation to metacognitive and cognitive categories is presented in the next table.



**Table 5.83 Overall Frequency of Metacognitive and Cognitive Categories: Control Group**

Category	Greenhouse		Bali	
	Frequency	Percentage	Frequency	Percentage
Metacognitive	86	33.86	104	36.36
Cognitive	168	66.14	182	63.64
<b>Total</b>	<b>254</b>	<b>100</b>	<b>286</b>	<b>100</b>

Out of the total 540, the increased frequency rate between the think-aloud reports taking place before- and after the instructional periods between the two texts 'Greenhouse' and 'Bali' was 32.

The number of strategies employed in both main categories clearly indicates clearly a sign of great improvement. In the metacognitive category, the frequency shows an increase of 18 (Greenhouse = 86, Bali = 104), while there was a higher increase of 14 in the frequency rate in the cognitive category (Greenhouse = 168, Bali = 182).

In the next section the discussion is based on comparative results reflecting the data gained from the experimental and control groups.

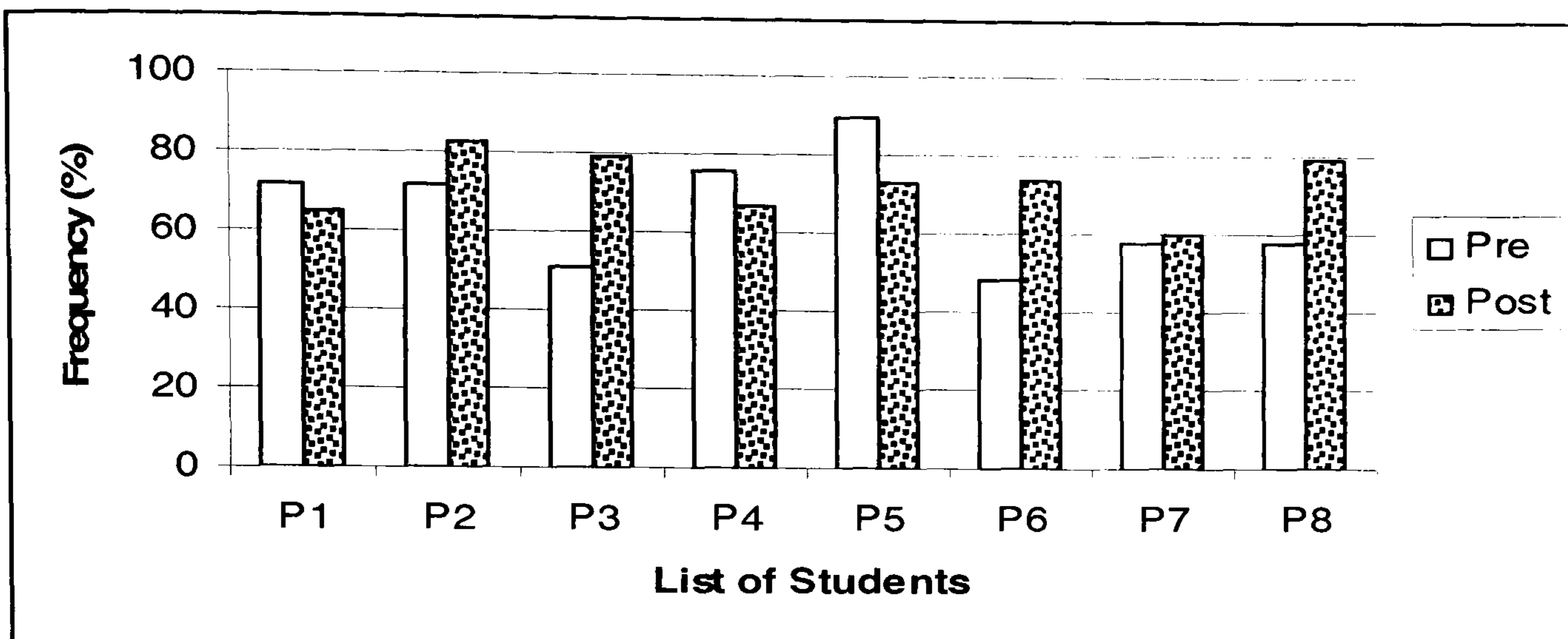
#### **5.1.4.3.3 Summary of the Reading Strategies Used Between Both Groups**

In the previous two sections, details of individual frequency of strategy use, distribution of types and frequency rates of reading strategies and overall frequency rates of metacognitive and cognitive categories between the experimental and control groups were discussed. The focus of this section aims to summarise some of the major findings drawn from the results presented earlier.

First, in terms of the details of individual frequency of strategy use, five students from both groups reported more frequent use of reading strategies, while three of them employed reading strategies less frequently in their second think-aloud report as can be seen from the figure below. Among the three students, two of them, P1 and P4 are in the experimental group, while one student, P5, is in the control group. Based on data drawn from Table 5.78 and 5.81, individual frequency rates can be presented as follows:

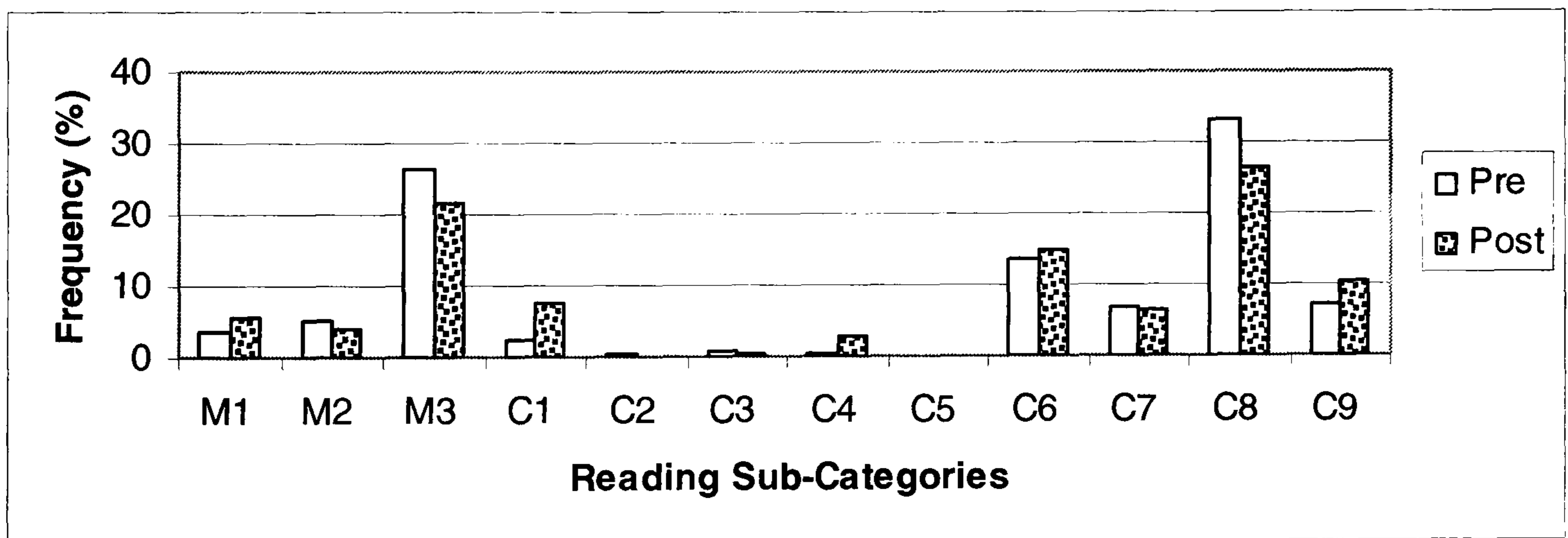


**Figure 5.7 Individual Frequency of Strategy Use from Both Groups**

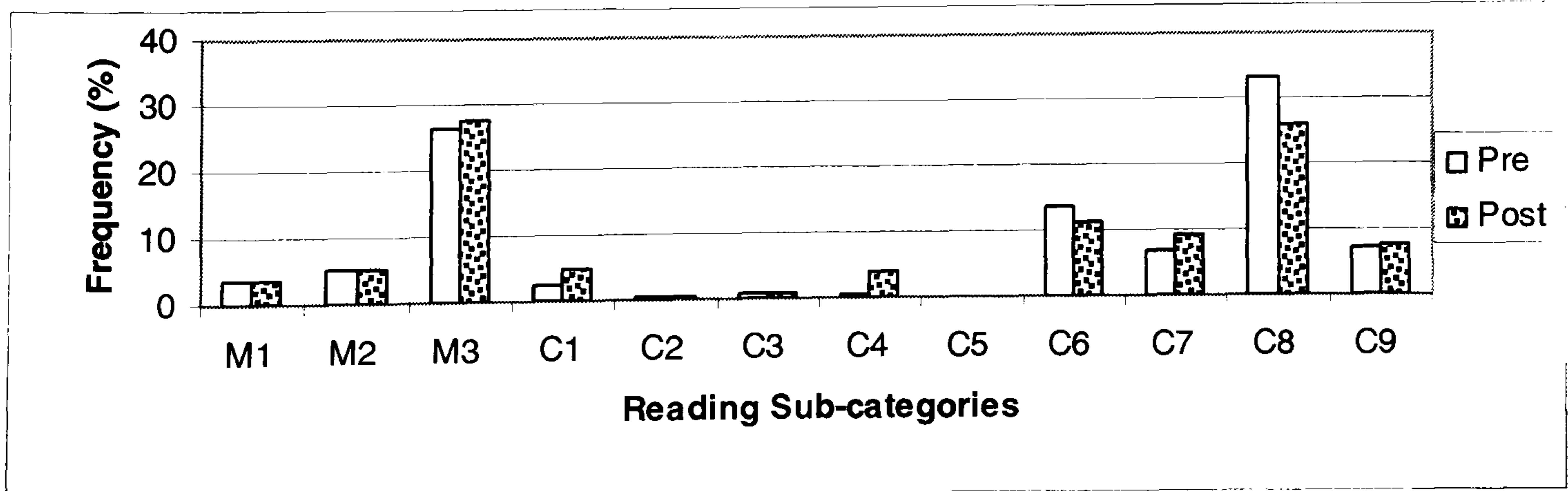


Secondly, data which appeared earlier in Table 5.79 and 5.82 are presented in the following Figures 5.8 and 5.9 to show the distribution of types and frequency rates of reading strategies between both groups.

**Figure 5.8 Distribution of Types and Frequency of Reading Strategies: Experimental Group**



**Figure 5.9 Distribution of Types and Frequency of Reading Strategies: Control Group**



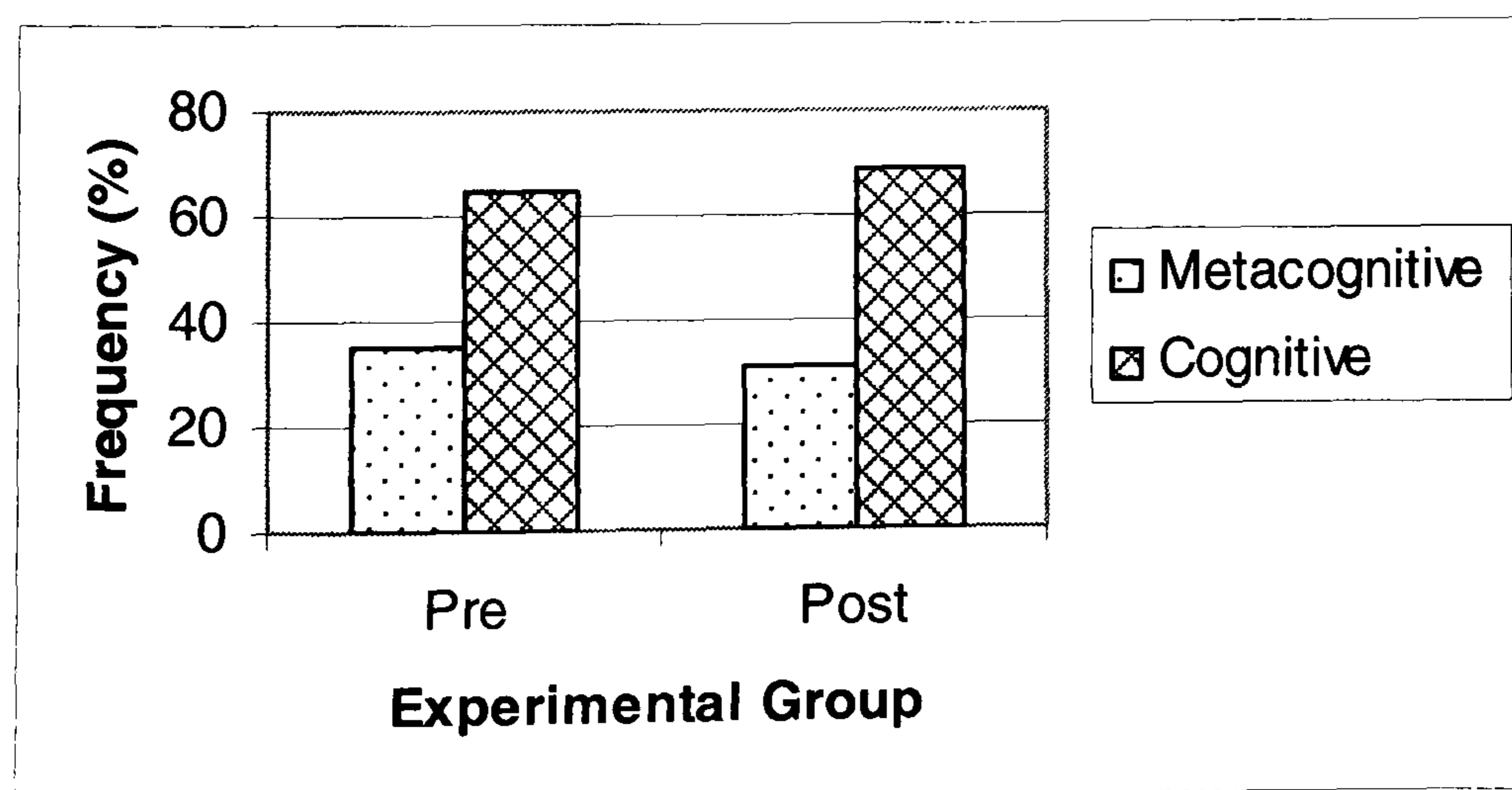


Based on Figures 5.8 and 5.9, it can be seen that there was an increase in the use of reading strategies as well as a decline in some between both groups. In the metacognitive category, the students in the experimental group used the sub-category of M1 Advance Organisation at a slightly higher rate than what was reported from the control group. However, the students in the control group reported more frequent use of the sub-categories of M3 Selective Attention and M4 Self-monitoring, while there was a decline of their use among the students in the experimental group.

With respect to the cognitive category, there was no major difference in the way reading strategies are employed between the two groups. With a slight variation in frequency use, the sub-categories of C1 Resourcing, C5 Deduction, C7 Auditory representation and C10 Inferencing all had higher frequency in the post-think- aloud session, whereas the sub-category of C9 Transfer was also found to be used less by the students in both groups. The differences in the use of the sub-categories of C2, C4, C6 and C8 are, however, small.

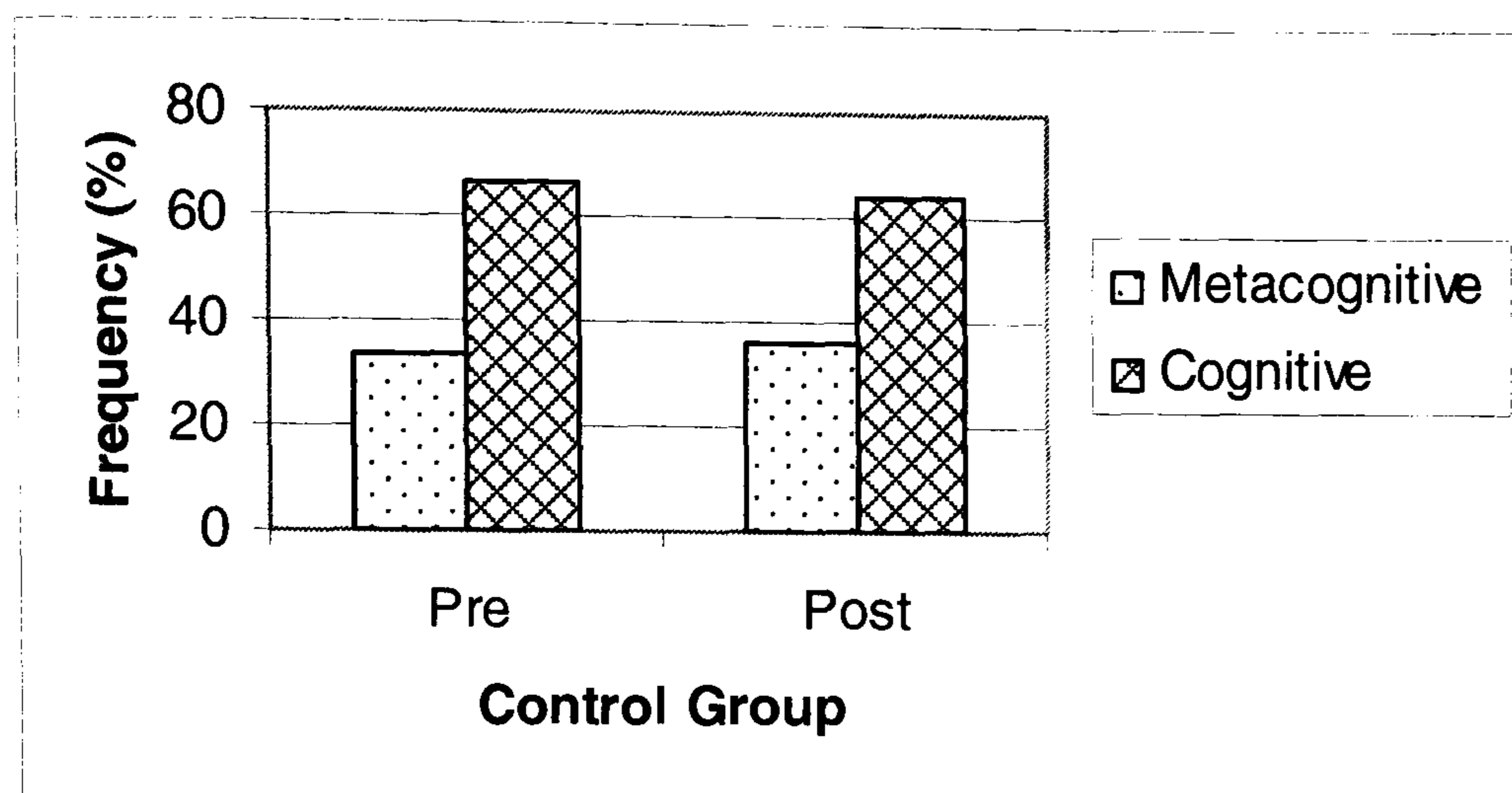
Finally, the issue of overall frequency rates of metacognitive and cognitive categories used over time between both groups will be discussed in this section. As mentioned earlier, both groups reported more frequent use of reading strategies in their post-think-aloud; however, there were some basic differences in the overall frequency rates in metacognitive and cognitive categories between the two. To highlight the difference in their frequency rates, data drawn from Table 5.80 and 5.83 can be represented in Figures 5.10 and 5.11 as follows:

**Figure 5.10 Overall Frequency of Metacognitive and Cognitive Categories: Experimental Group**





**Figure 5.11 Overall Frequency of Metacognitive and Cognitive Categories: Control Group**



In Figure 5.10, it can be seen that there was a decline in metacognitive strategies use over time combined with a slight increase of cognitive strategies among the students in the experimental group in their post-think-aloud session. However, the change of strategy use worked out differently for the students in the control group. Based on Figure 5.11, the use of metacognitive strategies in the post-instructional period was on the increase which coincided with a slight decrease of the strategy use in the cognitive category. The differences in mean scores are presented in the next two tables.

**Table 5.84 Difference in Mean Score over Time: Experimental Group**

Category	Pre-score		Post-score		Mean Difference
	Frequency	Mean	Frequency	Mean	
Metacognitive	96	24	91	22.75	- 1.25
Cognitive	175	43.75	203	50.75	+ 7
<b>Total:</b>	<b>271</b>	<b>67.75</b>	<b>294</b>	<b>73.5</b>	<b>+ 5.75</b>

**Table 5.85 Difference in Mean Score over Time: Control Group**

Category	Pre-score		Post-score		Mean Difference
	Frequency	Mean	Frequency	Mean	
Metacognitive	86	21.5	104	26	+ 4.5
Cognitive	168	42	182	45.5	+ 3.5
<b>Total:</b>	<b>254</b>	<b>63.5</b>	<b>286</b>	<b>71.5</b>	<b>+ 8</b>



Based on Table 5.84, the mean score between pre- and post-scores in the experimental group has dropped by 1.25 (Pre = 24, Post = 22.75) in the metacognitive category, while there is a gain of 7 in the cognitive category (Pre = 43.75, Post = 50.75). This has resulted in the improved mean score of 5.75, whereas data drawn from Table 5.85 shows that the mean score between the pre- and post-scores of the students in the control group is 8. The students made use of more reading strategies in both metacognitive and cognitive categories. The mean score under in categories has increased by 4.5 (Pre = 21.5, Post = 26) and 3.5 (Pre = 42, Post = 45.5) respectively.

Finally, it can be concluded that based on the total mean pre- and post- scores the students in the experimental group employed reading strategies at a higher frequency (Pre = 67.75, Post = 73.5) when compared to those used by the control group (Pre = 63.5, Post = 71.5). However, after the two different sets of mean scores between the two groups have been compared, the students in the control group are found to improve in their use of reading strategies at a higher rate of 8, while the improved score from the experimental group yields 5.75 in average.

## **5.2 Results of the Reading Log Study**

As mentioned earlier, this chapter presents qualitative findings of the think-aloud protocols as well as reading log studies which are organised in terms of the specific research questions 1, 2, and 3 as posed earlier in this chapter. While think-aloud protocols help to reveal the students' on-going reading process, the study of reading logs which is a type of self-report helps to reflect the reading strategies students use when dealing with problems while reading. Moreover, this agrees with O'Malley and Chamot (1990) in stating that data regarding strategy use should be collected in various circumstances. As details of the use of reading logs as a research tool as well as their strengths and limitations have already been discussed in Section 3.2.3 in the methodology chapter, the procedure of how the study on the reading log was conducted will be discussed next.



As part of the requirements of the research, all students in both experimental and control groups were asked to hand in their reading logs to the researcher. However, data to be presented in this section was based on the same group of students who had think-aloud reports with the researcher only. All of the eight students submitted their reading logs on three occasions: the first week, mid- and final-weeks of the academic term. As the first reading logs were considered to be trialled pieces of writing so that improvement could be made to the later versions, data are basically based on 16 entries the students submitted during mid- and final-weeks and will be referred to in this section as Time 1 and Time 2.

As there was no restriction on language use, the students could choose to write in either Thai or English. However, in order for the researcher to have a better understanding of their written accounts, the students were requested to attach a copy of the reading text together with their reading log form. The reading selections were based on a variety of text selections ranging from fiction, i.e., Harry Potter, to magazine and newspaper articles. Some of the non-fiction sources were taken from 'National Geographic', 'Far Eastern Economic Review', 'Reader's Digest' 'The Bangkok Post' and 'The Nation Junior'.

As the students' pieces of writing resemble think-aloud transcribed protocols, the findings in this section will be discussed and presented in the same manner as the think-aloud study. A sample of a student's written work supplemented by the corresponding text can be found in the next table.

**Table 5.86 A Sample of Student's Reading Log**

<b>Text</b>	<b>What problems did you have while reading?</b>	<b>What did you do to solve the problems?</b>	<b>Did it work?</b>
They've become such a part of social rituals that we hardly notice their persuasive- and often contradictory- role in our lives. (Source: <i>National Geographic</i> , January 2003)	I don't know some words such as, 'rituals', 'persuasive' and 'contradictory'. (Source: P5)	I used contextual clues, so that I could guess the probable meanings of 'rituals' and 'persuasive'. However, the last word was too hard for me, so I decided to use a dictionary.	Yes, with the help of dictionary. Contextual clues helped me as well.



The analysis of the student's data is mainly based on the content taken from the two columns under, 'How did you read?' and 'What did you do to solve the problems?' as their content represents the strategies the students used when reading and dealing with text difficulties. The student's written part as shown above will then be analysed into sub-categories in the same way as think-aloud protocols.

**Table 5.87 A Sample of How Strategies are Coded**

Student's written account	Coded reading strategy
<ul style="list-style-type: none"> <li>- I used contextual clues, so I can guess their probable meanings of 'rituals' and 'persuasive'.</li> <li>- However, the last word was too hard for me, so I decided to use a dictionary.</li> </ul>	C10.1 Guess unknown words  C1.1 Look up in the dictionary

Data based on reading logs were also collected in two different ways: records of different types of strategies employed as well as their frequency rates. A full list of data including overall types and frequency rates of reading strategies is included in Appendix K. The findings in response to research questions 1, 2 and 3 will be presented in three different sections as follows.

5.2.1 Overall Types and Frequency of Reading Strategies Employed by the Eight Students in the Main Study

5.2.2 A Comparison of Reading Strategies Employed Between High- and Low- Proficiency Students

5.3.3 A Comparison of Reading Strategies Used over Time between Both Groups

### **5.2.1 Overall Types and Frequency of Reading Strategies Employed by the Eight Students in the Main Study**

Based on the 16 entries of reading logs, the students in both groups have shown extensive use of metacognitive, cognitive strategies as well as social/affective strategies. Twenty-seven different reading strategies were identified and there were 182 instances of strategy use from 8 students. Tables 5.88 lists the frequency rates of the three main categories employed by the students in both groups.

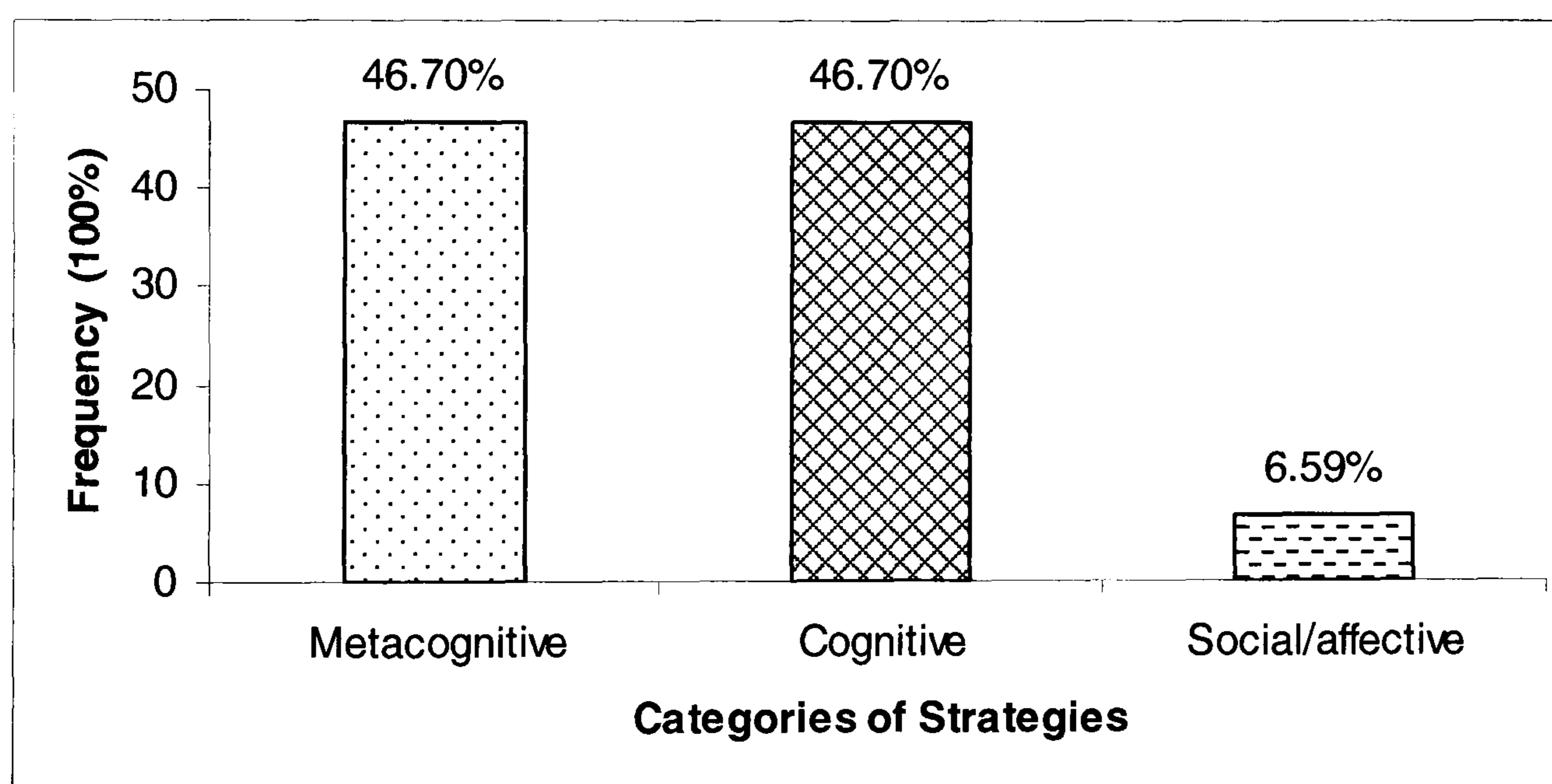


**Table 5.88 Overall Frequency of the Three Categories**

Category	Frequency based on		Total	Percentage
	Time 1	Time 2		
Metacognitive	41	44	85	46.70
Cognitive	39	46	85	46.70
Social/affective	7	5	12	6.59
<b>Total</b>	<b>87</b>	<b>95</b>	<b>182</b>	<b>99.99*</b>

\* Totals do not equal 100 because of rounding off.

Based on Table 5.88, data reveal that there was a tie of 85 instances (46.70%) between the use of metacognitive and cognitive strategies, while there was a small number of 12 instances in social and affective strategies indicating that the students in the study made use of both metacognitive and cognitive strategies at a high rate in their extensive reading. Reference can also be referred to Figure 5.12.

**Figure 5.12 Overall Frequency of the Three Categories**

Based on 16 entries of the reading logs, after data were analysed, coded and the frequency rates of reading strategies were counted, it can be summed up in the subsequent sub-categories as follows:

**Table 5.89 Distribution of Sub-Categories**

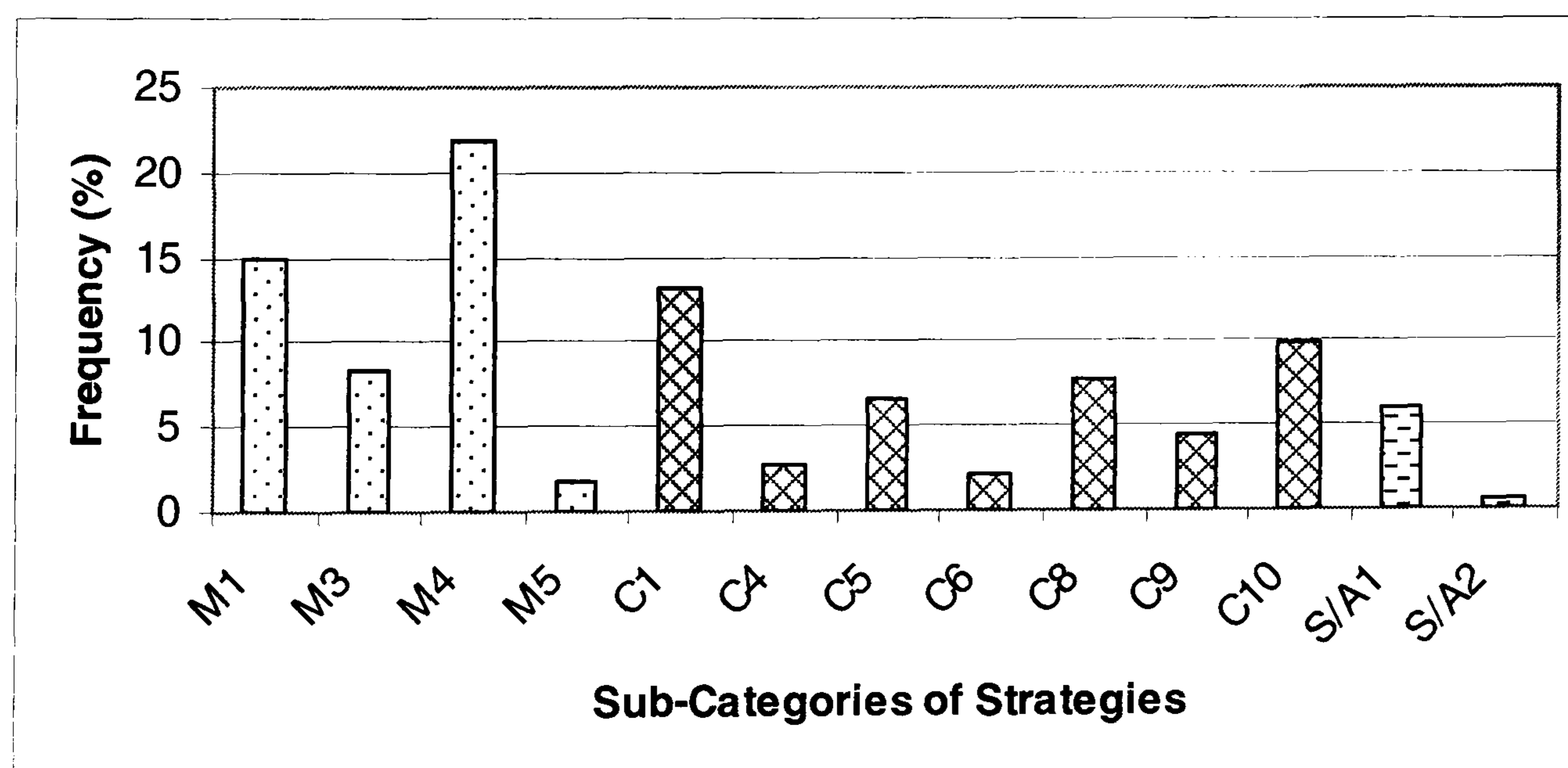
Sub-category	Frequency as found in		Total	Percentage
	Time 1	Time 2		
M1 Advance organisation	12	15	27	14.84
M3 Selective attention	7	8	15	8.24
M4 Self-monitoring	20	20	40	21.98



M5 Self-evaluation	2	1	3	1.65
C1 Resourcing	12	12	24	13.19
C4 Summarising	1	4	5	2.75
C5 Deduction	5	7	12	6.59
C6 Imagery	3	1	4	2.20
C8 Elaboration	5	9	14	7.69
C9 Transfer	5	3	8	4.40
C10 Inferencing	8	10	18	9.89
S/A1 Questioning for clarification	6	5	11	6.04
S/A2 Cooperation	1	0	1	0.55
<b>Total:</b>	<b>87</b>	<b>95</b>	<b>182</b>	<b>100.00</b>

According to Table 5.89, the sub-category of M4 Self-monitoring gained the highest frequency of 40 instances which was equivalent to 21.98%, followed by M1 Advance organisation (27, 14.84%) and C1 Resourcing (24, 13.19%). Some of the sub-categories reported at a low frequency included C6 Imagery (4, 2.20%), followed by M5 Self-evaluation (3, 1.65%) and S/A2 Cooperation (1, 0.55%). The distribution of each sub-category can be found in Figure 5.13.

**Figure 5.13 Distribution of Sub-Categories**



Strategies in the metacognitive, cognitive, social and affective categories will now be discussed in detail in Sections 5.2.1.1, 5.2.1.2 and 5.2.1.3 respectively, while the summary of types and frequency rates of reading strategies used is presented in Section 5.2.1.4.



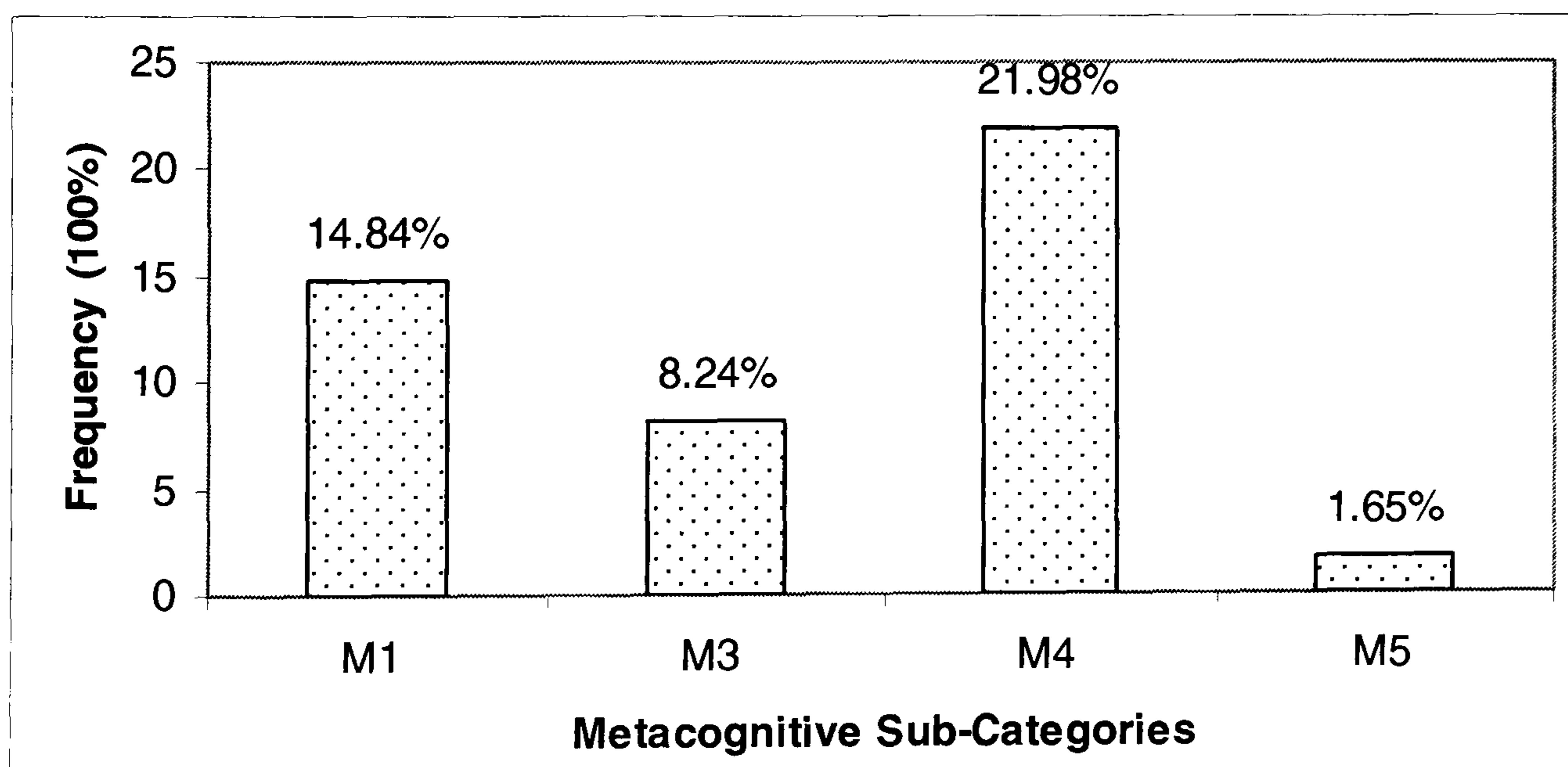
### 5.2.1.1 Discussion of Sub-Categories in the Metacognitive Category

Based on the 16 reading logs, the students' written work reflects four sub-categories of M1 Advance organisation, M3 Selective attention, M4 Self-monitoring and M5 Self-evaluation. The total frequency was found to be 85 or 46.70% of total strategies reported, among which 14 different metacognitive strategies were identified. Data can be summed up in Table 5.91 and Figure 5.14.

**Table 5.90 Frequency of Metacognitive Sub-Category**

Sub-category	Frequency as found in		Total	Percentage
	Time 1	Time 2		
M1 Advance organisation	12	15	27	14.84
M3 Selective attention	7	8	15	8.24
M4 Self-monitoring	20	20	40	21.98
M5 Self-evaluation	2	1	3	1.65
<b>Total</b>	<b>41</b>	<b>44</b>	<b>85</b>	<b>46.70</b>

**Figure 5.14 Frequency of Metacognitive Strategies**



Based on the data presented in both Table 5.90 and Figure 5.14, it can be seen that M4 gained the highest frequency, followed by M1 Advance organisation, M3 Selective attention. The use of M5 Self-evaluation was reported with the lowest frequency of 3 instances. Discussion of all sub-categories and corresponding written accounts based on the students in the study will be presented next.



### **M1 Advance Organisation**

The use of M1 Advance organisation is reflected in 27 instances and is equivalent to 14.84%. Some of the strategies with the highest frequency rates were M1.4 “skim read the text” (14, 7.69%) and M1.1 “guess from title” (7, 3.85%). P1 and P2 reported high use of both strategies. P1 wrote, “I read the title first which helps to make me know it’s a company’s name. I then skim through the text once”, while P2 described his use of strategies as, “I read the headline of the news and tried to guess what’s it all about.”

### **M3 Selective Attention**

There were 15 instances which was equivalent to 8.24%. Some of the strategies with highest frequency rates were M3.4 “ignore insignificant/unknown words” (8, 4.40%) and M3.2 “pay attention to the use of punctuation marks” (4, 2.20%). As P1 wrote, “I just ignored this problematic word. Without it, I was still able to grasp the general meaning of the sentence.”

### **M4 Self-Monitoring**

Based on the written accounts, there were 40 instances reported which was equivalent to 21.98% and makes it the sub-category with the highest use among the other three metacognitive sub-categories. The two strategies with highest frequency rates were M3.11 “reread” (17, 9.34%) and M3.12 “read slowly and carefully” (11, 6.04%). The students coded as P5 and P6 made use of both strategies quite often when compared to the others. This is reflected in P5’s written account as follows: “I read it twice. First, I read to know what it talked about. Second, I read it more carefully to understand the details.”

### **M5 Self-Evaluation**

The sub-category of M5 Self-evaluation gained the lowest frequency (3, 1.65%) of all suggesting that the students in the study did not usually evaluate how well they understood the text after reading. There were two instances of M5.2 “evaluate how well the text is understood”, while there was one instance of M5.1 “evaluate if reading purpose is met”. The written account reported by P4 reflecting the use of M5.2 can be found as he wrote, “I asked myself if I understood what I read.”



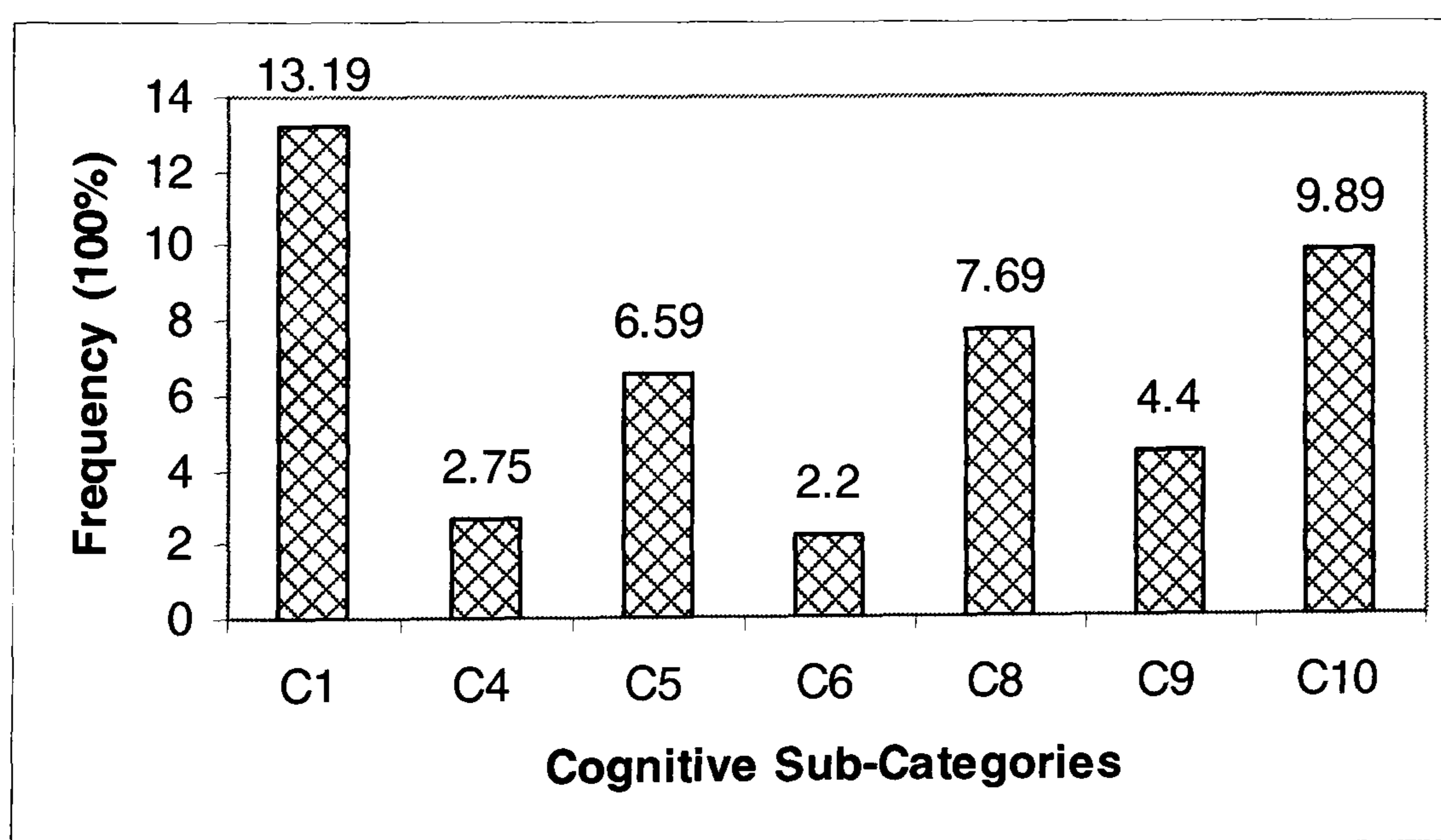
### 5.2.1.2 Discussion of Sub-Categories in the Cognitive Category

There were a similar number of 85 instances of strategy use in the cognitive category which is equivalent to 46.71%, among which 11 different cognitive strategies were identified. The seven cognitive sub-categories consist of C1 Resourcing, C4 Summarising, C5 Deduction, C6 Imagery, C8 Elaboration, C9 and C10 Inferencing, among which 11 different cognitive strategies were identified. Data is summed up and presented in Table 5.91 and Figure 5.15.

**Table 5.91 Frequency of Cognitive Sub-Category**

Sub-category	Frequency as found in		Total	Percentage
	Time 1	Time 2		
C1 Resourcing	12	12	24	13.19
C4 Summarising	1	4	5	2.75
C5 Deduction	5	7	12	6.59
C6 Imagery	3	1	4	2.20
C8 Elaboration	5	9	14	7.69
C9 Transfer	5	3	8	4.40
C10 Inferencing	8	10	18	9.89
<b>Total:</b>	<b>39</b>	<b>46</b>	<b>85</b>	<b>46.71</b>

**Figure 5.15 Frequency of Cognitive Strategies**



According to Table 5.91 and Figure 5.15, C1 Resourcing had the highest frequency, followed by C10 Inferencing and C8 Elaboration. The two sub-categories with low frequency rates were C4 Summarising and C6 Imagery. Corresponding written accounts of cognitive sub-categories are to be presented next.



## **C1 Resourcing**

The sub-category of C1 Resourcing which consists of C1.1 “look up in the dictionary”, and C2 “fit meaning into context” gained highest frequency of 24 (13.19%). While there were 22 instances (12.09%) reported using the strategy of C1.1 “look up in the dictionary”, there were only 2 instances (1.10%) under C2 “fit meaning into context”.

Although all students made use of C1.1, the highest rate of frequency came from P1 with 6 instances. Based on one of her accounts on one occasion when she failed to figure out the meaning of ‘chain’ as found in the context of, “Everyone knew the chain was on the verge of bankruptcy”, she went straight to the dictionary, looked the word up, and searched for its nearest definition to the particular context. P1 wrote, “I looked up the word in the dictionary and tried to find the meaning that best fits the context. As I figured it out, the word ‘chain’ refers to branches of the same company.”

## **C4 Summarising**

The sub-category of C4 Summarising gained the second lowest frequency (5, 2.75%) indicating that the students rarely made use of this type of strategy while or after reading. Based on the reading logs, P2 used C4.1 “summarise the content read” on a few occasions as he wrote, “In some paragraphs, if I didn’t quite understand what they were talking about, I would try to summarise the main concepts to see what the main ideas were all about.”

## **C5 Deduction**

Six out of the 8 students reported the use of C5 Deduction resulting in 12 instances (6.59%). P4 made use of this strategy more frequently than the others. He wrote, “I looked at all the punctuation marks while figuring out what their functions were.” Another written account was from P8 as he pointed out, “I read and tried to locate the subject, verb and object in each sentence.”



## **C6 Imagery**

With 4 instances (2.20%), this makes the sub-category of C6 Imagery the lowest frequency of all among other cognitive sub-categories. The strategy of C5.1 “visualise information” was sparsely used by a few students including P1, P4 and P5. As P5 recalled, “I looked at the sentence that I found confusing again. This time I read more slowly while trying to create the image in my head.”

## **C8 Elaboration**

The use of the strategies of C8.1 “activate known vocabulary” and C8.2 “activate previous knowledge” in the sub-category of C8 Elaboration comes the third highest with 14 instances, 7.69%. Between the two strategies, C8.2 gained higher frequency of 12 instances, 6.59%, while there were only 2 instances, 1.10% reported from C8.1. Both P1 and P5 reported high use of C8.2. As for P1 who chose to base one of her reading logs on a chapter from “Harry Potter and the Prisoner of Azkaban” wrote, “Before reading, I tried to remind myself of what I already know about Harry Potter from the previous books I had read.”

## **C9 Transfer**

There were 8 instances reported in the sub-category of C9 Transfer which was equivalent to 4.40%. The strategy of C9.1 “translate into Thai” was reported by P4 at the highest rate. He wrote, “After I read each sentence, I tried to conceptualise its basic meaning and then translated it into Thai.”

## **C10 Inferencing**

The last sub-category of C10 Inferencing gained the second highest use of all (18, 9.89%). Seven out of 8 students reported the use of strategies in this cognitive sub-category. It mainly consists of C10.1 “guess unknown words”, C10.3 “make a prediction” and C10.4 “make use of illustrations while reading”. In general, P3’s and P5’s written accounts reflected high use of C10.1 “guess unknown words”.



For example, in order to guess the probable meaning of the word ‘soil’ in the way it appears in the context of “...which bring nitrogen from the atmosphere into the soil.” She wrote, “After I looked at some other words in the context like ‘atmosphere’, I then figured it out the process helps to take nitrogen from the atmosphere into the ground. Therefore, *soil* means more or less the same as *ground*.”

### 5.2.1.3 Discussion of Sub-Categories in the Social/Affective Category

In comparison with metacognitive and cognitive categories, strategies in the social/affective category received lowest frequency of 12, 6.59%. Their use is reflected into the two sub-categories of S/A1 Questioning for clarification and S/A2 Cooperation. Data are presented in Table 5.92 and Figure 5.16.

**Table 5.92 Frequency of Social/Affective Sub-Category**

Sub-category	Frequency as found in		Total	Percentage
	Time 1	Time 2		
S/A1 Questioning for clarification	6	5	11	6.04
S/A2 Cooperation	1	0	1	0.55
<b>Total:</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>6.59</b>

**Figure 5.16 Frequency of Social/Affective Strategies**

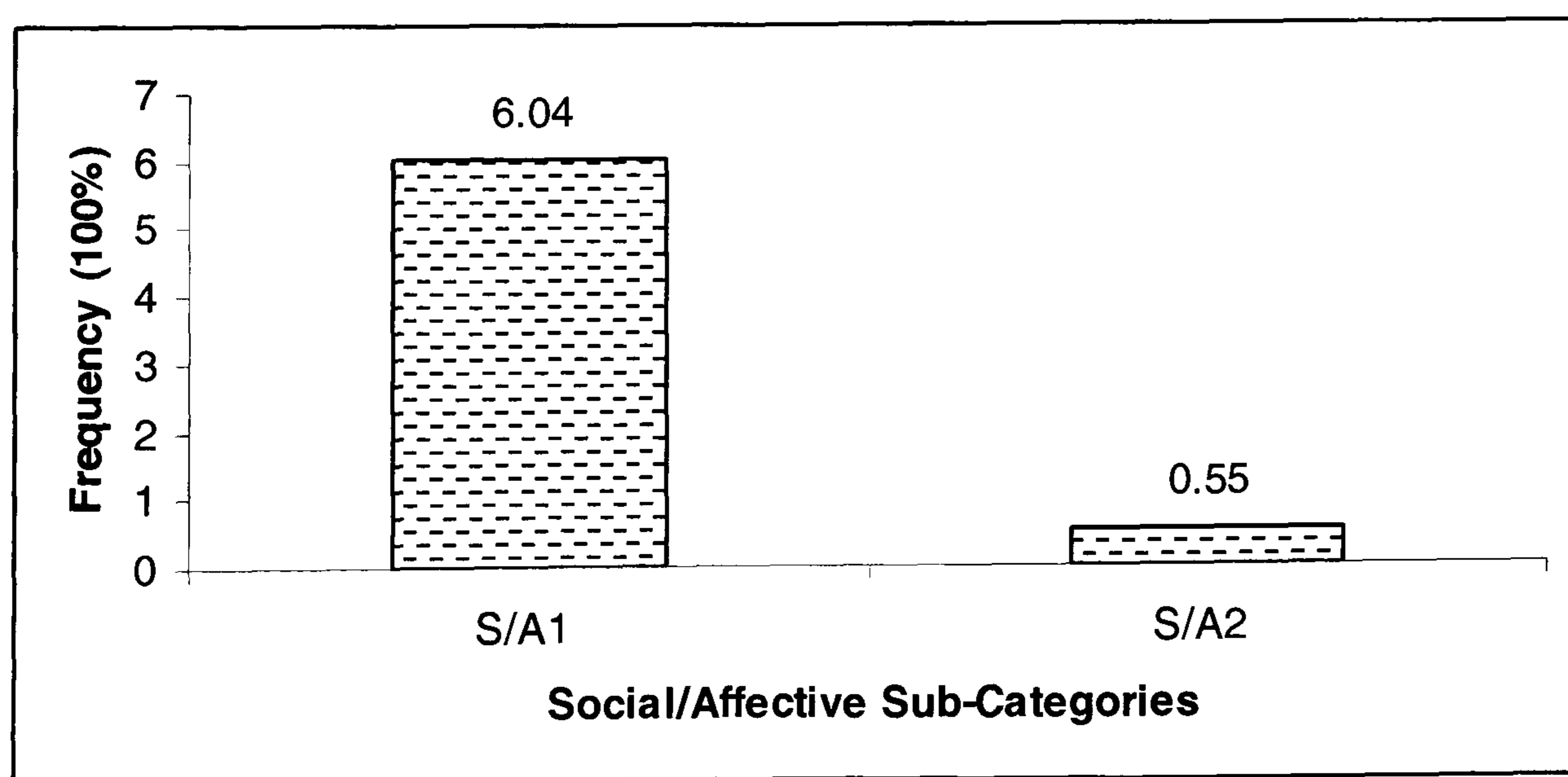


Table 5.92 and Figure 5.16 reveal that S/A1 Questioning for clarification gained higher frequency than S/A2 Cooperation with the difference of 10 instances. Discussion of these two sub-categories will be dealt with next.



### S/A 1 Questioning for Clarification

There was only one strategy reported in the sub-category of S/A1.1 “ask friends” 11, 6.04%. Only three students, P1, P2, and P6, reported its use when reading. Asking help from friends has some disadvantages in that it may not be a reliable source. As revealed by P1, “I asked some of my friends to read the question I didn’t understand, but some of them could not help me as they didn’t understand it themselves, while some gave me different explanations.”

### S/A2 Cooperation

The low frequency of one occurrence indicates that the students rarely talked or discussed with friends after reading. Based on the reading logs, the use of strategy S/A 2.1 “read & discuss with friends” was reported by P1 as she wrote, “I sometimes asked my friends to read the same text and discussed it with them to see if we could agree what the text was all about.”

#### 5.2.1.4 Summary of Types and Frequency Rates of Reading Strategies Employed in Reading Logs

The discussions in the three previous sections are based on presenting the frequency rates of strategies in the 13 sub-categories together with the students’ written accounts. In order to give a clear presentation of strategy distribution, all of the 27 reading strategies in the 13 sub-categories as reported in the students’ reading logs will be put into rank order according to the frequency of their use.

**Table 5.93 Rankings of the Reading Strategies Based on Reading Logs**

Ranking order	Reading strategy	Frequency	
		Frequency	Percentage
1	C1.1 Look up in the dictionary	22	12.09
2	M4.11 Reread	17	9.34
3	C10.1 Guess unknown words	16	8.79
4	M1.4 Skim read the text	14	7.69
5	C8.2 Activate previous knowledge	12	6.59



6	C5.1 Apply known rules	12	6.59
7	S/A1.1 Ask friends	11	6.04
8	M4.12 Read slowly and carefully	11	6.04
9	M3.4 Ignore insignificant/unknown words	8	4.40
10	C9.1 Translate into Thai	8	4.40
11	M1.1 Guess from title	7	3.85
12	C4.1 Summarise the content read	5	2.75
13	M4.9 Read ahead	4	2.20
14	M4.14 Underline unknown parts	4	2.20
15	M4.13 Go back to read earlier section	4	2.20
16	M3.2 Pay attention to the use of punctuation marks	4	2.20
17	C6.1 Visualise information	4	2.20
18	M3.1 Pay attention to key words	3	1.65
19	M1.3 Set a purpose in reading	3	1.65
20	M1.2 Preview the text	3	1.65
21	M5.2 Evaluate how well the content is understood	2	1.10
22	C1.2 Fit meaning into context	2	1.10
23	C8.1 Activate known vocabulary	2	1.10
24	M5.1 Evaluate if reading purpose is met	1	0.55
25	S/A2.1 Read & discuss with friends	1	0.55
26	C10.4 Make use of illustrations while reading	1	0.55
27	C10.3 Make a prediction	1	0.55
<b>Total</b>		<b>182</b>	<b>100</b>

Based on the data in Table 5.93, it reveals that the students preferred using a dictionary (22, 12.09%) to guessing unknown words (16, 8.79%) when dealing with difficult words. They also read several times (17, 9.34%) to have a better understanding of what the text was about. In addition, they made use of their experience (12, 6.59%) as well as their knowledge about language (12, 6.59%) to help them improve their understanding of the text.

Based on their written accounts, four of the reading strategies have a low frequency of 1 (0.55%) which suggests that when reading extensively, the students did not normally evaluate how well they understood the text. They tended not to discuss what they read with their friends, or make predictions about the text.



## 5.2.2 A Comparison of Reading Strategies Employed Between High- and Low-Proficiency Students

The focus in this section is to investigate the reading strategies as found reported in the students' reading logs between the two groups of readers at different proficiency levels, high and low. This is based on the same criteria used earlier in relation to think-aloud verbal reports in Section 5.1.4.2. The same data as presented in Appendix K will be used although the students' groupings will be different.

### 5.2.2.1 Overall Frequency of High- and Low-Proficiency Readers

Based on Appendix K, there were 182 instances of reading strategies from both levels of their reading proficiency. Table 5.93 presents the frequency rates in the three main categories between the two groups.

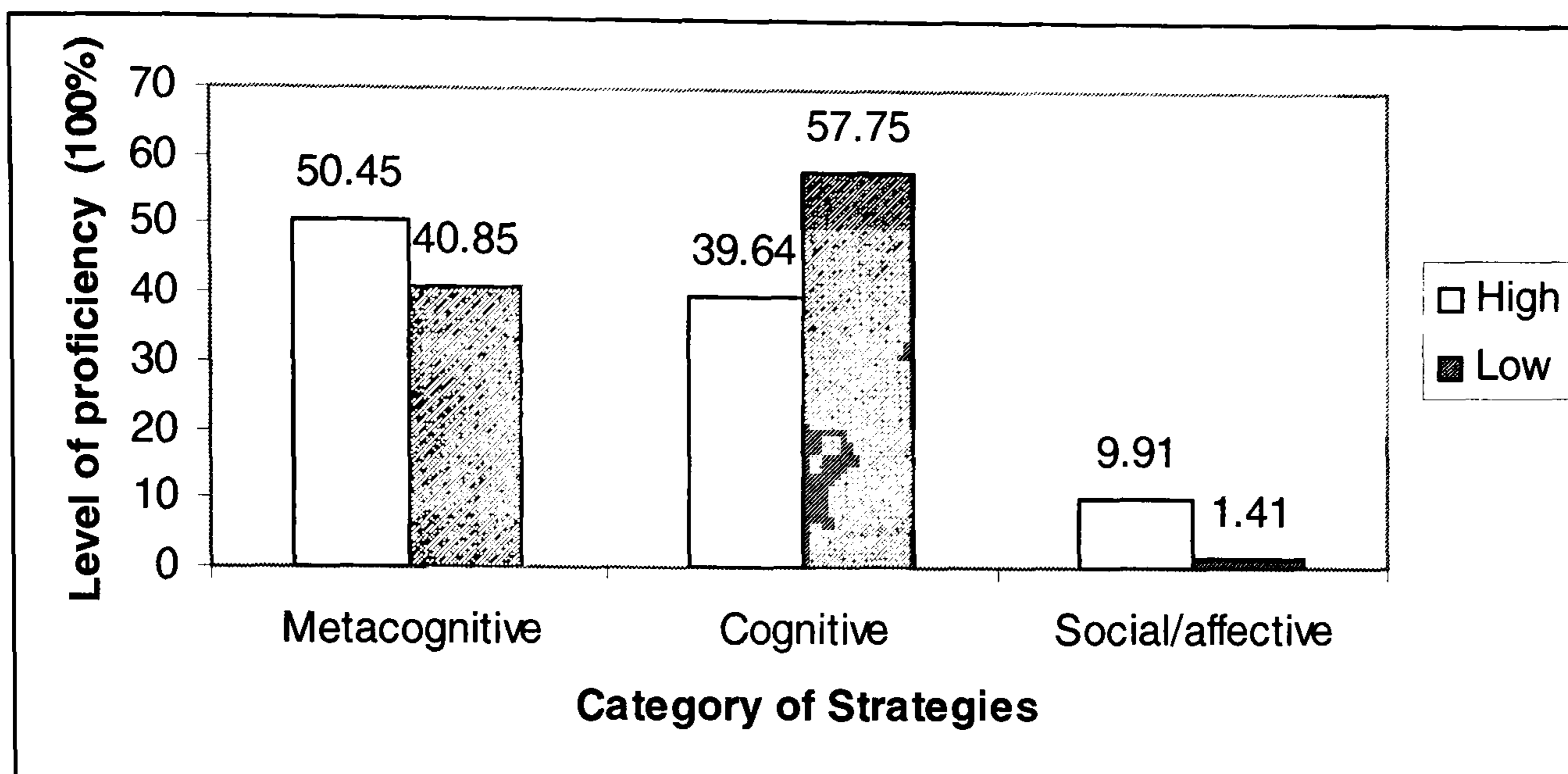
**Table 5.94 Overall Frequency of High and Low Level Readers**

Category	Frequency of High		Frequency of Low	
	Frequency	Percentage	Frequency	Percentage
Metacognitive	56	50.45	29	40.85
Cognitive	44	39.64	41	57.75
Social/affective	11	9.91	1	1.41
<b>Total</b>	<b>111</b>	<b>100.00</b>	<b>71</b>	<b>100.00</b>

Based on data presented in Table 5.94, it is obviously seen that the high group reported a higher number of strategies used compared to the low group (high = 111, low = 71). This suggests that high-proficiency students use more strategies when reading. After frequency rates were converted and assigned into the particular categories they belong to; figures in percentages reveal that the high group made more use of metacognitive strategies than cognitive strategies, (metacognitive frequency = 50.45 %, cognitive frequency = 40.85%) On the contrary, the low group made use of cognitive strategies at a higher rate in comparison to the high group (cognitive frequency = 57.75%, metacognitive frequency = 40.85%).

Although the strategies in the social/affective category were found to be lower than the other two main categories, a higher frequency was found among the high-proficiency group (high = 11, 9.91%, low = 1, 1.41%). The same set of data can also be presented as a figure as follows:



**Figure 5.17 Overall Frequency of High and Low Level Students**

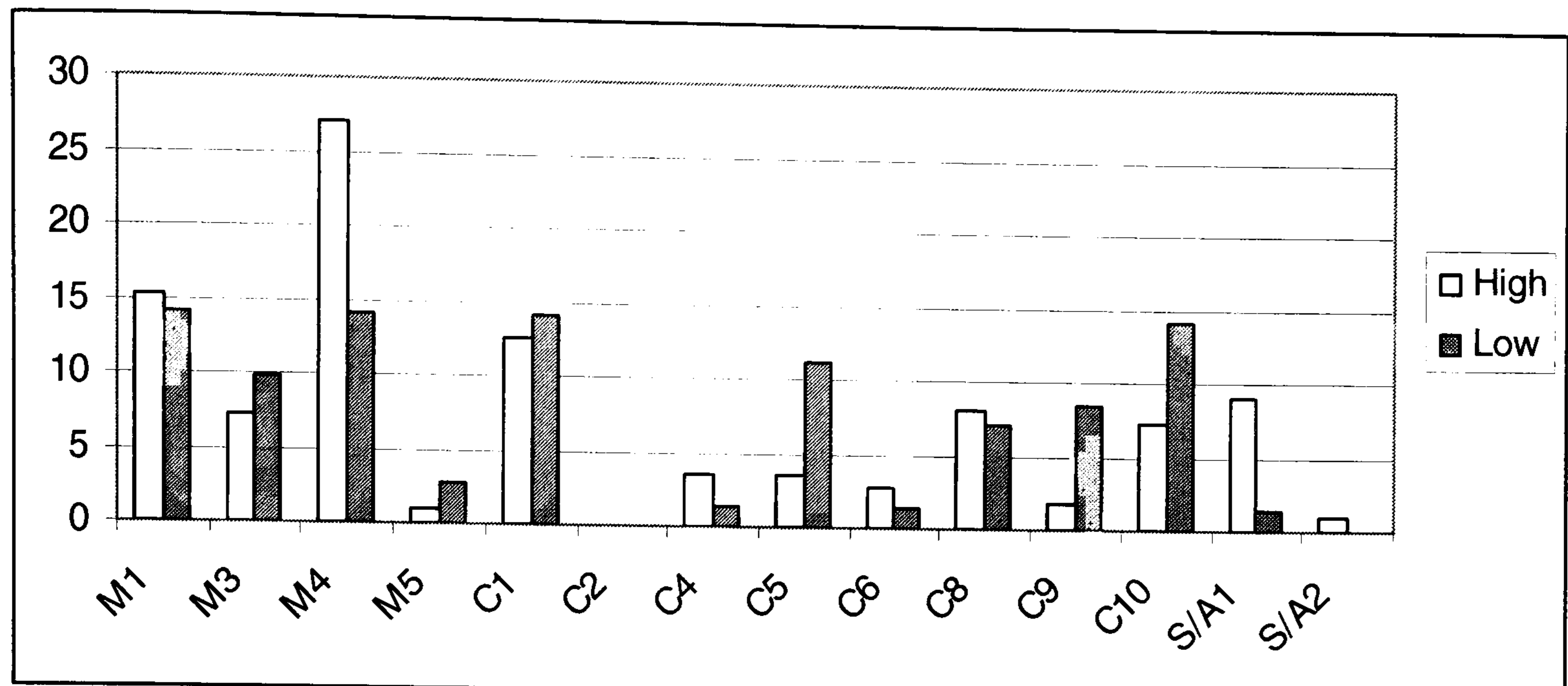
Details of strategy frequency rates between the two groups under each sub-category can be summarised in Table 5.95 and Figure 5.18.

**Table 5.95 Reading Strategies Employed Between High and Low Level Readers**

Sub-category	High		Low	
	Frequency	Percentage	Frequency	Percentage
M1 Advance organisation	17	15.32	10	14.08
M3 Selective attention	8	7.21	7	9.86
M4 Self-monitoring	30	27.03	10	14.08
M5 Self-evaluation	1	0.90	2	2.82
C1 Resourcing	14	12.61	10	14.08
C4 Summarising	4	3.60	1	1.41
C5 Deduction	4	3.60	8	11.27
C6 Imagery	3	2.70	1	1.41
C8 Elaboration	9	8.11	5	7.04
C9 Transfer	2	1.80	6	8.45
C10 Inferencing	8	7.21	10	14.08
S/A1 Questioning for clarification	10	9.01	1	1.41
S/A2 Cooperation	1	0.90	0	0.00
<b>Total</b>	<b>111</b>	<b>100.00</b>	<b>71</b>	<b>100.00</b>



**Figure 5.18 Reading Strategies Employed Between High- and Low-Proficiency Students**



The data suggests that there was a difference in the patterns of strategy use between the two groups of readers and will be discussed in the next two sections by focussing on one group in each section.

#### 5.2.2.2 Strategies Employed by High-Proficiency Readers

Among high-proficiency readers, the metacognitive strategies most frequently cited in their written accounts were found in the sub-categories of M4 Self-monitoring (30, 27.03%) and M1 Advance organisation (17, 15.32%) although some other metacognitive strategies in the sub-categories of M3 Selective attention and M5 Self-evaluation were also used.

As quoted from one of P1's written accounts, she explained the sequence of how she approached the text as follows, "I first looked at the title, and then the chapter number. I paid attention to the use of different fonts in bold and italics as well as all other punctuation marks. I then skimmed the text once while underlining certain parts that I didn't quite understand clearly. I then read again, more slowly and carefully this time. I looked back and tried to make myself understand where I had underlined before."

To categorise, P1's written accounts reflect a number of strategies she used during her reading process, some of which include: M1.1 "guess from title", M1.4 "skim read the text", M3.2 "pay attention to the use of punctuation marks", M4.11 "reread" and M4.14 "underline unknown parts".



Concerning cognitive strategies, some of the most frequently cited in the students' written accounts were found in the sub-categories of C1 Resourcing (14, 12.61%) and C8 Elaboration (9, 8.11%).

In general, although high-proficiency readers tried to guess unknown words based on the context, they also relied on a dictionary if they failed to do so. P2 wrote, "When I see difficult words, I would look them up in the dictionary. However, I used my experience to help understand the content of the news." Regarding the use of experience integrating with the other sub-category of C6 Imagery, P5 also wrote, "While I read, I make the image in my head which is based on my experience. This is to make sure that I understand things better."

In relation to the last category of social/affective strategies, there were 10 instances of its use under S/A1.1 "ask friends" and S/A 2.1 "read & discuss with friends". P2 wrote, "I didn't understand what I was reading, so I asked my roommate."

### 5.2.2.3 Strategies Employed by Low-Proficiency Readers

As discussed earlier that the number of strategies use among low-proficiency students was relatively low in comparison with the high-proficiency group, this results in low frequency rates in all three main categories. In the metacognitive sub-categories, there was an equal frequency of 10 (14.08 %) in the use of strategies in M1 Advance organisation and M4 Self-monitoring.

Based on the students' written accounts, P3 described the reading strategies she used briefly as, "I skimmed read first before I read again more carefully." In contrast to P1's account given previously, her strategies reflected only 2 strategies; M1.4 "skim read the text" and M3.11 "reread".

In the cognitive sub-categories, there was also another equal tie of 10 (14.08 %) in the use of both C1 Resourcing and C10 Inferencing indicating the lower-proficiency students made use of these two strategies more often when reading. According to P7, the use of a dictionary was her first priority as she wrote, "I looked for the meaning in the dictionary and then the context." However, as for P3, one of her reading logs revealed that she only consulted the dictionary after she failed to guess the unknown words as in, "I didn't know what *take a gamble* means, and couldn't guess from the context, so I had to look it up in the dictionary."



The strategies in the social/affective category had lowest frequency among the low-proficiency students suggesting they did not ask friends for help nor did they discuss reading problems with them when having difficulties.

### 5.2.3 A Comparison of Reading Strategies Used over Time Between Both Groups

The discussion in this section is based on comparing the frequency rates of reading strategies used between pre- and post- instruction periods between the experimental and control groups. Based on Appendix K, the data concerning the strategies used by the students in the experimental group are discussed in Section 5.2.3.1, whereas Section 5.2.3.2 involves data regarding the control group. Finally, the summary of the reading strategies used by both groups is given in Section 5.2.3.3.

#### 5.2.3.1 The Experimental Group

The overall frequency of strategy use among the students in the experimental group can be summed up as follows:

**Table 5.96 Individual Frequency of Strategies Use: Experimental Group**

Student's code	Frequency of Strategy		Total
	Time 1	Time 2	
P1	22	29	51
P2	13	12	25
P3	7	12	19
P4	19	6	25
<b>Total</b>	<b>61</b>	<b>59</b>	<b>120</b>

Based on Table 5.96, there was a difference of 2 between pre- and post- reading logs (Time 1 = 61, Time 2 = 59). An increased number of strategies were found in the students coded as P1 and P3, 7 and 5 instances respectively, while P2's accounts showed a small decline of 1 and a sharp decline of 13 in P4's.

A more detailed summary of the distribution of types and frequency rates of reading strategies as used by the students in the experimental group is presented in the next table.



**Table 5.97** Distribution of Sub-Categories and Frequency Rates of Reading Strategies: Experimental Group

Sub-category	Time 1		Time 2	
	Frequency	Percentage	Frequency	Percentage
M1 Advance Organisation	8	13.11	7	11.86
M3 Selective Attention	6	9.84	4	6.78
M4 Self-monitoring	11	18.03	13	22.03
M5 Self-evaluation	2	3.28	1	1.69
C1 Resourcing	9	14.75	8	13.56
C4 Summarising	1	1.64	3	5.08
C5 Deduction	4	6.56	5	8.47
C6 Imagination	1	1.64	1	1.69
C8 Elaboration	4	6.56	6	10.17
C9 Transfer	5	8.20	1	1.69
C10 Inferencing	4	6.56	5	8.47
S/A1 Questioning for clarification	5	8.20	5	8.47
S/A 2 Cooperation	1	1.64	0	0.00
<b>Total</b>	<b>61</b>	<b>100.00</b>	<b>59</b>	<b>100.00</b>

With reference to Table 5.97, the frequency rates between Time 1 and Time 2 showed small differences in numbers, whereas the first three sub-categories between remained the same regarding their rankings. In respective order, the sub-categories that were used most frequently consist of M4 Self-monitoring (Time 1 = 11, 18.03%, Time 2 = 13, 22.03%), C1 Resourcing (Time 1 = 9, 14.75%, Time 2 = 8, 13.56%) and M1 Advance Organisation (Time 1 = 8, 13.11%, Time 2 = 7, 11.86%). While M4 gained a small increase by 2 instances, there was a minor decrease of 1 in the other two sub-categories of C1 and M1. After the sub-categories have been grouped according to the three main categories, their frequency rates can be summed up and presented in the next table.

**Table 5.98** Overall Frequency of Metacognitive and Cognitive Categories: Experimental Group

Category	Time 1		Time 2	
	Frequency	Percentage	Frequency	Percentage
Metacognitive	27	44.26	25	42.37
Cognitive	28	45.90	29	49.15
Social/affective	6	9.84	5	8.47
<b>Total</b>	<b>61</b>	<b>100.00</b>	<b>59</b>	<b>99.99*</b>

\* Totals do not equal 100 because of rounding off.



From both reports on reading logs, the frequency rate was 120 in total, Time 1 = 61 and Time 2 = 59, which results in a difference of 2. Data also show that there was a small decrease of 2 in the metacognitive category (Time 1 = 27, Time 2 = 25) and a decline of 1 in frequency in the social/affective category (Time 1 = 6, Time 2 = 5). However, there was a small increase of 1 in frequency in the cognitive category (Time 1 = 28, Time 2 = 29).

Data as found in the control group will be discussed in the next section before comparison between the two groups is made subsequently.

### 5.2.3.2 The Control Group

Based on the overall frequency of strategy use as found in the reading logs, data regarding the students in the control group can be summed up in the following table.

**Table 5.99 Individual Frequency of Strategy Use: Control Group**

Student's code	Frequency of Strategy		Total
	Time 1	Time 2	
P5	10	10	20
P6	5	10	15
P7	7	8	15
P8	4	8	12
<b>Total</b>	<b>26</b>	<b>36</b>	<b>62</b>

According to Table 5.99, although there were 62 strategies reported from the students in the control group, there was a sharp increase of 10 between the two (Time 1 = 26, Time 2 = 36). As can be seen from a breakdown of the figures, the students coded as P6, P7, and P8 reported more strategy use in their second reading logs, resulting in a higher frequency of 5, 1, and 4 respectively in Time 2, while P5's use of strategies stayed unchanged with the frequency of 10 in both periods. Distribution of sub-categories and frequency rates of reading strategies is to be presented and discussed next.



**Table 5.100 Distribution of Sub-Categories and Frequency Rates of Reading Strategies: Control Group**

Sub-category	Time 1		Time 2	
	Frequency	Percentage	Frequency	Percentage
M1 Advance Organisation	4	15.38	8	28.57
M3 Selective Attention	1	3.85	4	14.29
M4 Self-monitoring	9	34.62	7	25.00
M5 Self-evaluation	0	0.00	0	0.00
C1 Resourcing	3	11.54	4	11.11
C4 Summarising	0	0.00	1	2.78
C5 Deduction	1	3.85	2	5.56
C6 Imagination	2	7.69	0	0.00
C8 Elaboration	1	3.85	3	8.33
C9 Transfer	0	0.00	2	5.56
C10 Inferencing	4	15.38	5	13.89
S/A1 Questioning for clarification	1	3.85	0	0.00
S/A 2 Cooperation	0	0.00	0	0.00
<b>Total</b>	<b>26</b>	<b>100.00</b>	<b>36</b>	<b>100.00</b>

There were variations in relation to the frequency rate among sub-categories between Time 1 and Time 2. With reference to Table 5.100, the most frequently used strategies in Time 1 were in the sub-categories of M4 Self-monitoring (9, 34.62%), while there was a tie of 4 (15.38%) in the sub-categories of M1 Advance Organisation and C10 Inferencing. However, the ranking in Time 2 was different as M1 (8, 28.57%) was the most frequent sub-category used among the students in the control group. This was followed by M4 (7, 25.00%) and C10 (5, 13.89%) respectively. Data can be categorised into the major categories and this is presented next.

**Table 5.101 Overall Frequency of Metacognitive and Cognitive Categories: Control Group**

Category	Time 1		Time 2	
	Frequency	Percentage	Frequency	Percentage
Metacognitive	14	53.85	19	52.78
Cognitive	11	42.31	17	47.22
Social/affective	1	3.85	0	0.00
<b>Total</b>	<b>26</b>	<b>100.01*</b>	<b>36</b>	<b>100.00</b>

\*Totals do not equal 100 because of rounding off.

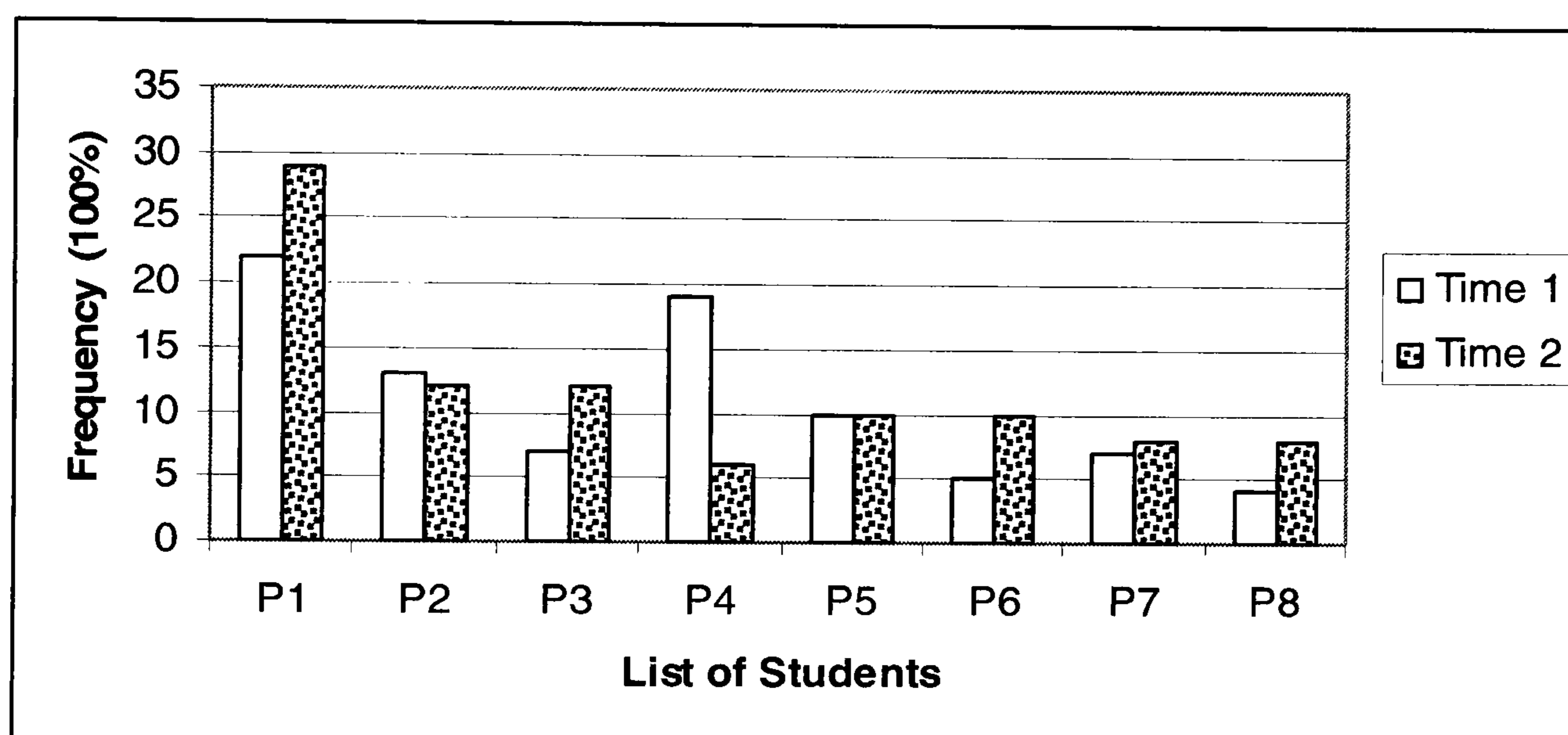


Despite a small number of frequency rates reported from the control group, data show that more strategies were reported in both metacognitive and cognitive categories. While there was an increase of 5 in the metacognitive category (Time 1 = 14, Time 2 = 19), there were 6 more instances higher in the cognitive category (Time 1 = 11, Time 2 = 17). However, there was one instance of strategy use in the social/affective category, while no instance in this category was reported in the second account of the reading logs.

### 5.2.3.3 Summary of the Reading Strategies Used between Both Groups

Data based on individual frequency of strategies use in both the experimental and control groups are summed up and presented in Figure 5.19.

**Figure 5.19 Overall Frequency of Reading Strategies**

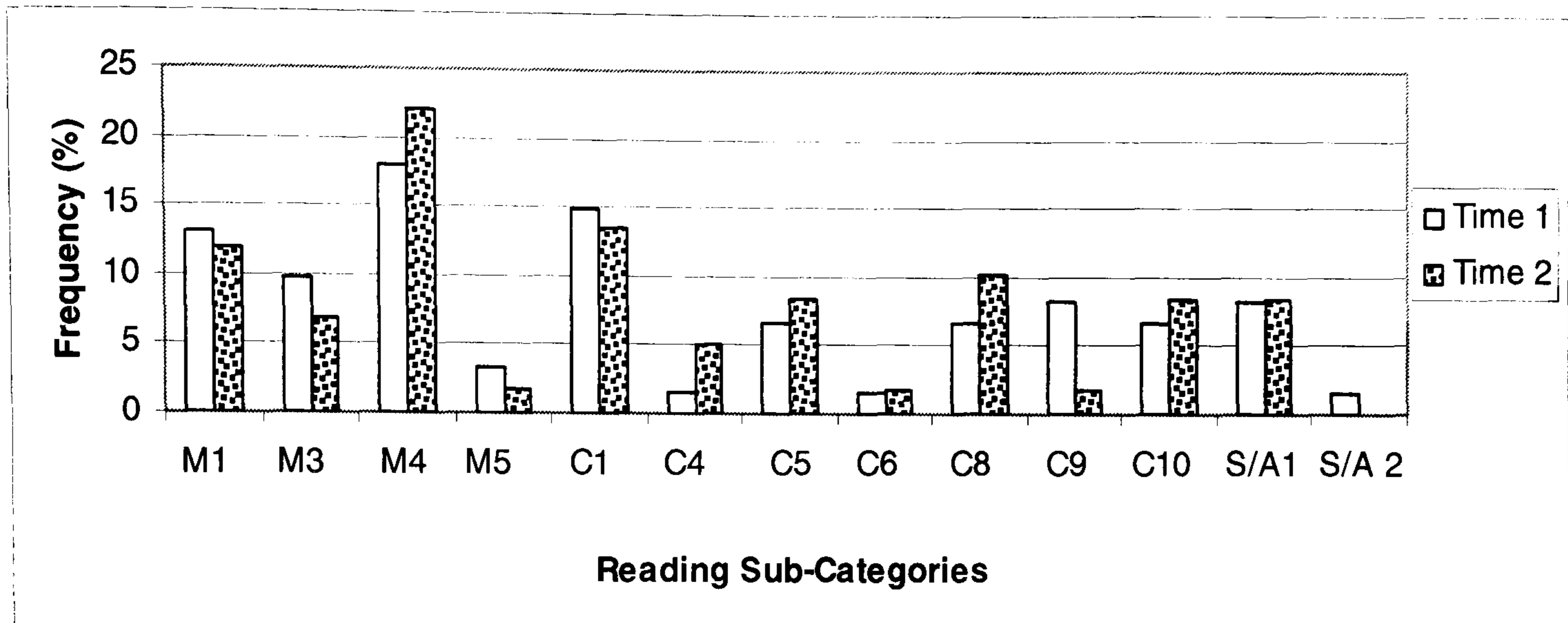


Previous data as earlier presented in Table 5.95 and 5.98 suggest that the frequency of strategy use between the two groups in their pre- as well as post-reports yields mixed results. Regarding the comparison between Time 1 and Time 2 of both groups, the strategy use in their post-reports was found to be higher among five students (P1, P3, P6, P7 and P8), lower between two students (P2 and P4) and constant as found in one student (P5).

However, the students in the experimental group reported more frequent use of strategies in their reading logs although their overall frequency rate in their post report shows a slight decline. On the other hand, the students in the control group did not report as frequent strategy use as the experimental group, but their overall frequency rate shows some improvement in their post-reports.

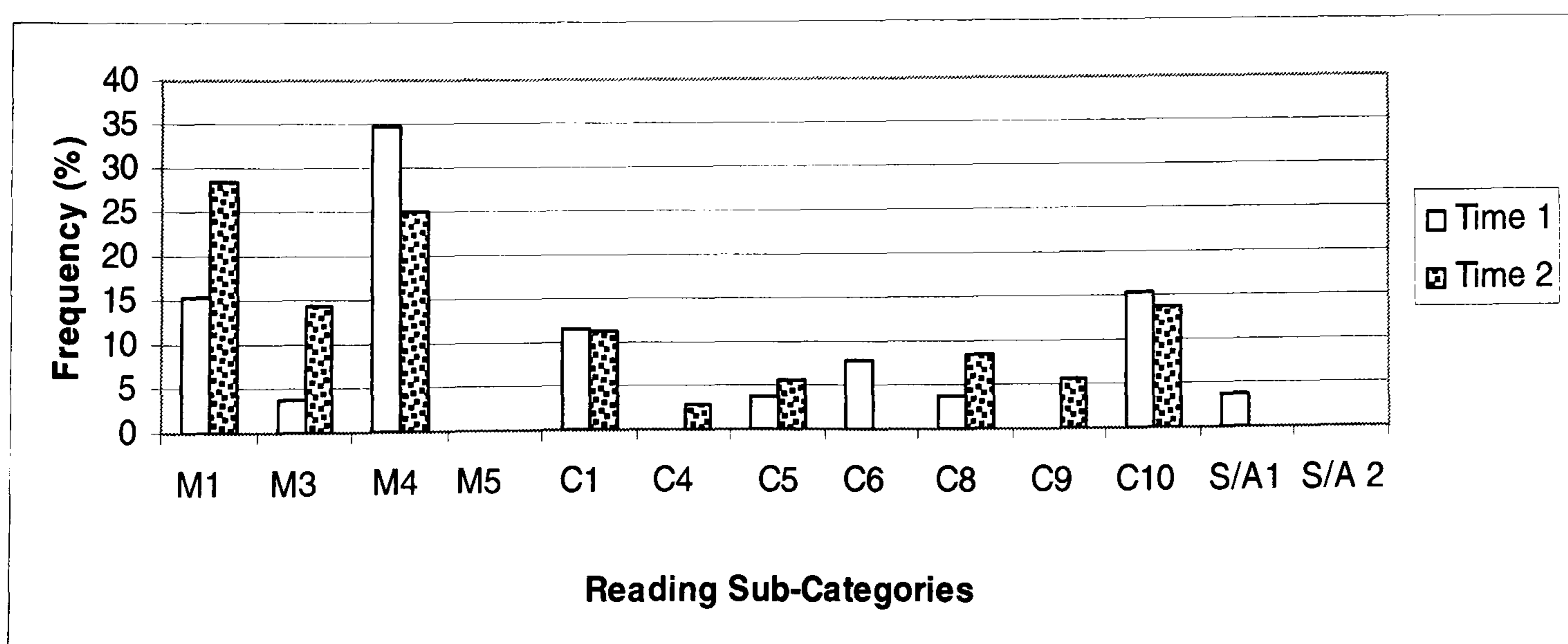


**Figure 5.20 Distribution of Types and Frequency of Reading Strategies: Experimental Group**



Comparing the sub-categories reported by the students in the experimental group, five of thirteen sub-categories showed a higher frequency rate in the post-reading logs although the increase in the rate was low within a narrow range of 1-2, some of which include M4 Self-monitoring, C4 Summarising, 5 Deduction and C8 Elaboration. Six categories had a lower frequency rate with a range of 1-4. The sub-category with a sharp decrease of 4 was C9 Transfer, while some other sub-categories which showed a slightly decline in their use were M1 Advance Organisation, M3 Selective Attention and S/A2 Cooperation. The two sub-categories of C6 Imagination and S/A1 Questioning for clarification remained the same regarding their frequency rates of 5 and 1 respectively.

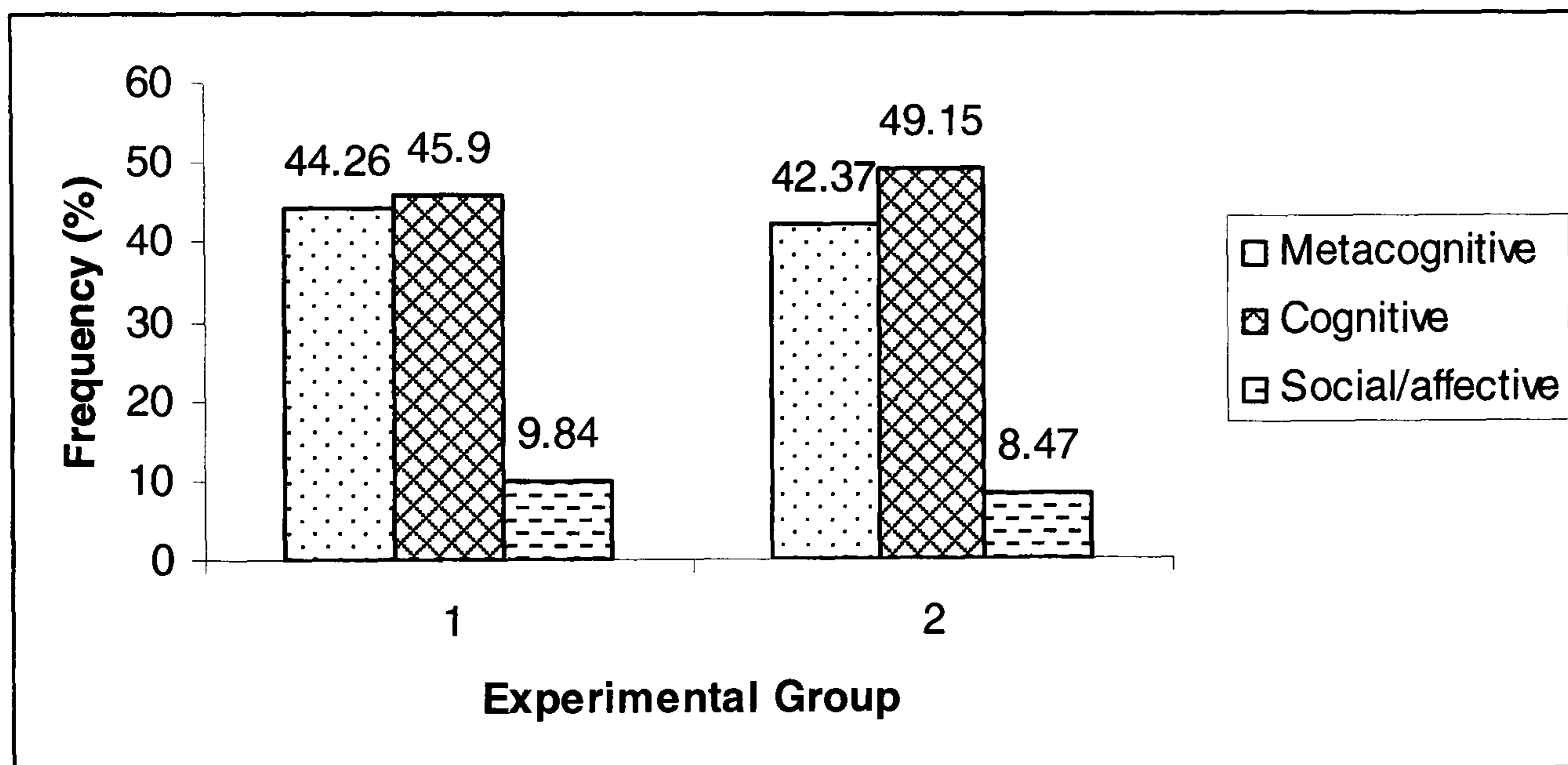
**Figure 5.21 Distribution of Types and Frequency of Reading Strategies: Control Group**



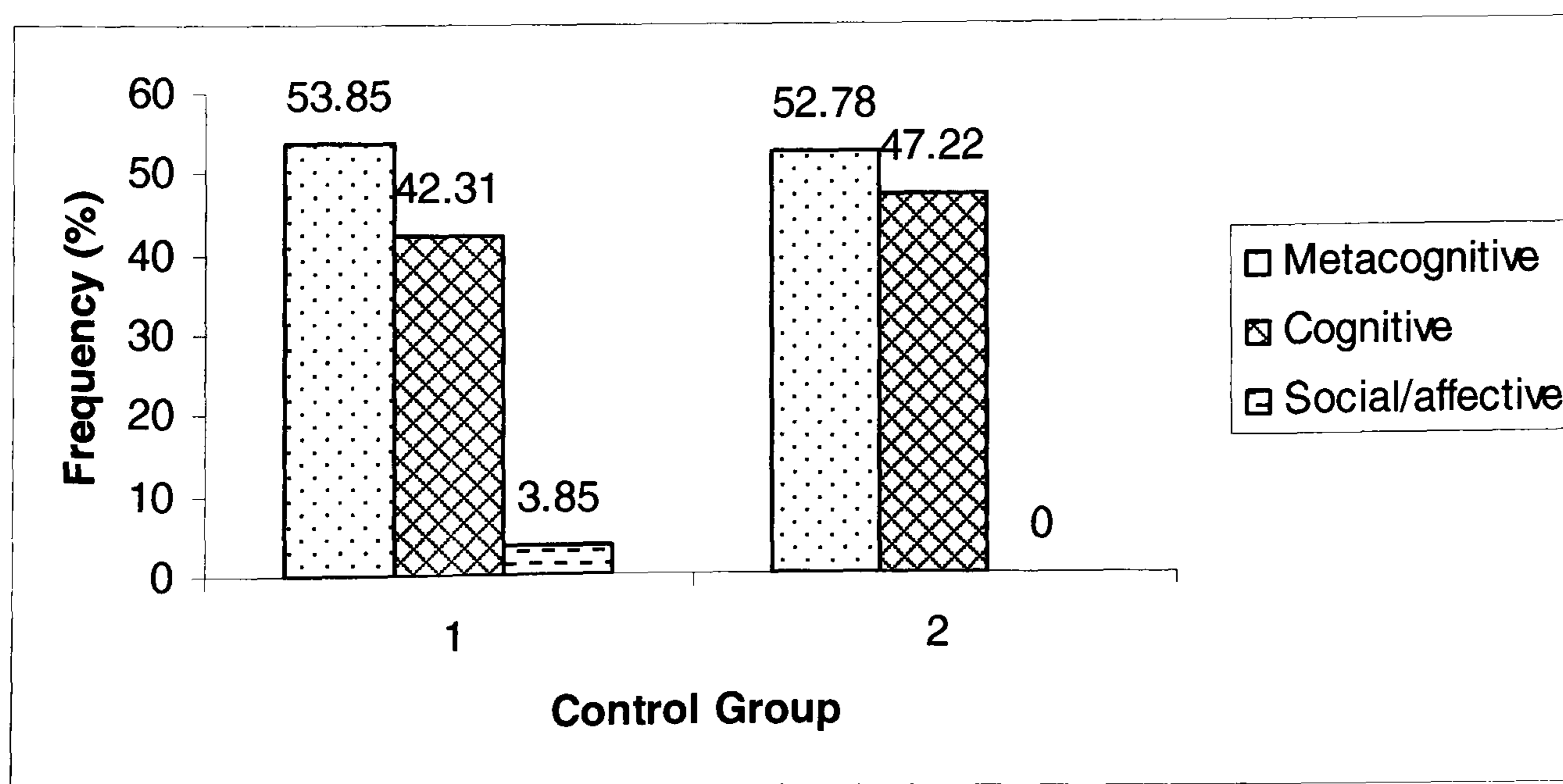


With reference to Figure 5.21, eight of thirteen sub-categories gained a higher frequency rate in the post-reading logs within a range of 1-4. M1 Advance Organisation and M3 Selective Attention gained the highest increased rates of 4 and 3 respectively. Some other sub-categories with higher reports of their use included C1 Resourcing, C8 Elaboration and C9 Transfer. Three areas gained lower frequency rates with a narrow range of 1-2 which included M4 Self-monitoring, C6 Imagination and S/A1 Questioning for clarification. The sub-categories with no report of their use in both pre-and post-reports were M5 Self-evaluation and S/A2 Cooperation.

**Figure 5.22 Overall Frequency of Three Main Categories: Experimental Group**



**Figure 5.23 Overall Frequency of Three Main Categories: Control Group**





The data presented in Figure 5.22 and Figure 5.23 reflect patterns of strategy use between the two groups regarding their strategy use between Time 1 and Time 2, or as presented in both figures as 1 and 2 respectively.

With reference to Figure 5.22, although the students in the experimental group reported high use of both metacognitive and cognitive strategies at both Time 1 and Time 2, cognitive strategies outnumbered the use of metacognitive strategies across time suggesting that they relied more on cognitive strategies when reading after and before reading strategy training. On the contrary, data in Figure 5.23 reveals that the students in the control group preferred using metacognitive strategies to cognitive strategies although they showed a slight decline in Time 2 which coincides with a decrease in cognitive strategy use.

Strategies in the social/affective category were used moderately by the students in the experimental group at the beginning, while experiencing a small decline after reading strategy training (Time 2). In contrast, the students in the control group used fewer social/affective strategies in their pre-reports and no strategies in this area were reported in their post-reports. Differences in mean scores of the two groups will be presented next in Table 5.102 and Table 5.103.

**Table 5.102 Difference in Mean Score over Time: Experimental Group**

	Time 1		Time 2		Mean Difference
	Frequency	Mean	Frequency	Mean	
Metacognitive	27	6.75	25	6.25	-0.5
Cognitive	28	7	29	7.25	+0.25
Social/affective	6	1.5	5	1.25	-0.25
<b>Total:</b>	<b>61</b>	<b>15.25</b>	<b>59</b>	<b>14.75</b>	<b>-0.5</b>

**Table 5.103 Difference in Mean Score over Time: Control Group**

	Time 1		Time 2		Mean Difference
	Frequency	Mean	Frequency	Mean	
Metacognitive	14	3.5	19	4.75	1.25
Cognitive	11	2.75	17	4.25	1.5
Social/affective	1	0.25	0	0	-0.25
<b>Total:</b>	<b>26</b>	<b>6.5</b>	<b>36</b>	<b>9</b>	<b>2.5</b>



The total mean scores in both tables help to reveal overall amount of strategy use reported by the students in both groups and reveal the fact that the students in the experimental group reported higher strategy use. However, data in Table 5.102 show that the students in the experimental group show a slight decline in their use of strategies across time in spite of their high use of strategies (Time 1,  $M = 15.25$ , Time 2,  $M = 14.75$ ) which results in a negative difference score of  $-0.5$ .

This is opposite to the control group as the students showed some improvement in strategies use in their post-reports despite receiving no strategy training (Time 1,  $M = 6.5$ , Time 2,  $M = 9$ ) although it is worth pointing out that the strategies were reported at a much lower rate in comparison with those reported by the experimental group. However, based on Table 5.103, the total mean score of the control group yields a positive score of  $2.5$ .

### **5.3 Conclusion**

The discussion in this chapter is based on the analysis of qualitative data based on two research tools of think-aloud reports and reading log studies. The discussion is an attempt to answer research questions 1, 2 and 3. The chapter begins by providing the information on the think-aloud procedure, its coding and analysis procedures. Results of the think-aloud study were presented next in three different sections corresponding with the three research questions. The chapter than finishes off by presenting and discussing data based on reading log studies in the same manner as the think-aloud verbal report. Discussion of the findings, implications, and limitations will be discussed in Chapter 6 which is the last chapter of the study.



## **Chapter 6**

### **Discussion of the Findings, Implications, and Limitations**

The purpose of the present study was to investigate the effect of integrating reading strategy training into the English Foundation Course with the aim of improving students' reading comprehension. In order to conduct the study, experimental research was set up by applying different treatments of with and without- reading strategy training to experimental and control groups. A reading comprehension test was used to measure the students' reading scores before- and after- the instruction period, and other research tools, namely the reading strategy questionnaire, think-aloud verbal reports and reading logs, were used to investigate the use of reading strategies before and after the instruction so that the results could be compared.

The discussion in this chapter is in four main sections. The results of the main findings are discussed in response to the six research questions in Section 6.1, while the implications drawn from the study are discussed in the next section. The issues concerning limitations of the study and recommendations for future research are to be presented in Sections 6.3 and 6.4.

#### **6.1 Discussion of Findings**

Results of both types of quantitative and qualitative findings are organised in relation to the 6 research questions and presented in Sections 6.1.1-6.1.6 respectively.

6.1.1 What are the Reading Strategies the Students in the Experimental and the Control Groups Use When Reading English Texts?

6.1.2 Is There any Relationship between the Students' Level of Reading Proficiency and the Types and Frequencies of Reading Strategies Reported?

6.1.3 What is the Difference in the Types and Frequencies of Reading Strategies Used over Time between the Experimental and the Control Groups?

6.1.4 Does Strategy Training Help the Students in the Experimental Group to Improve Their Reading Proficiency Significantly?

6.1.5 Do the Students in the Control Group Benefit from the Usual Approach to Teaching Reading in Improving Their Reading Proficiency?

6.1.6 To What Extent Do the Students at Different Levels in Both Groups Benefit from the Two Different Teaching Approaches?



### **6.1.1 What are the Reading Strategies the Students in the Experimental and the Control Groups Use When Reading English Texts?**

The students' use of strategies were analysed from strategy questionnaires, think-aloud verbal reports and reading logs. These research tools reveal that the students in the study used a wide range of reading strategies when reading although the use of cognitive strategies was reported to be slightly higher than metacognitive and social/affective strategies based on questionnaires and think-aloud protocols.

To recap, cognitive strategies refer to “steps readers take while engaging in the reading process to maximise their comprehension by making use of their available resources, previous knowledge or experience.” Apart from C9 Transfer, the cognitive strategies which gained the highest mean scores across the three research tools were in the two sub-categories of C8 Elaboration and C1 Resourcing. The use of C8 Elaboration suggests that the students relied on their experience to help familiarise themselves with the topic or content of the text they were reading. Some of the reading strategies included, “make use of experience”, “connect new information to old” and “activate known vocabulary”.

This is in line with Anderson (1999) who states that “meaning does not rest solely in the printed word, but that the reader brings certain knowledge to the reading that influences comprehension” (p. 12). The claim is also supported by Carrell and Eisterhold (1990) who point out that the reader's schemata play a significant role and need to be activated appropriately to enhance comprehension.

Based on questionnaires and reading logs, the other cognitive sub-category that gained high average scores was C1 Resourcing, “look up words in dictionary” and “fit meaning into context”. The use of the dictionary suggests that the students usually consult the dictionary when having difficulties understanding difficult vocabulary. Although the strategy of “guess unknown words from context” was in use, the frequency was generally found to be less than consulting the dictionary.

According to Nuttall (2000), what poses difficulties with understanding words derives from a number of factors, such as idioms, words with several meanings and technical terms. However, frequently looking up new words in the dictionary results in ineffective reading due to the fact that students' reading is slowed down and their thinking is interrupted.



Metacognitive strategies are referred to in this study as “attempts or initiations readers consciously take to facilitate their reading process including making a plan, monitoring and checking their understanding”. Across the three different research tools, the metacognitive strategies that were found in use most frequently were in the sub-category of M4 Self-monitoring. As reflected in the analysis of the strategy questionnaires and reading logs, some of the strategies were: “reread” and “read more slowly” which suggest that the students adjust the way they read when having difficulties with the text. These two strategies appear in a list of reading strategies use as proposed by Knight et al. (1985), but are phrased as “rereading” and “changing speed” instead.

Data based on verbal protocols reflected different aspects of metacognitive strategy use in that the students reported high frequency use of “identify the source of reading problems”, “verify one’s understanding of the text” and “asking information about the text” while reading. This suggests that they actively monitored their comprehension and were involved in getting at the meaning of the text. According to Block (1992), students should be encouraged to search for the source of their problems. The findings support the view that metacognitive strategies engage readers in checking and monitoring their comprehension regularly during reading activities.

Strategies in the social/affective category gained the lowest frequencies of all. Social/affective strategies are those which involve interaction or cooperation with others. Reported use in social/affective strategies were found in questionnaires and reading logs under the strategies of “encourage self to try harder” and “ask friends for help with the vocabulary or translation if do not understand”. The first strategy suggests that the students tried to motivate themselves to read, while the second strategy reveals they turn to friends for help in the case of having problems. Data based on think-aloud protocols did not report the use of social/affective strategies. This may have resulted from the instruction given to the students to read as if they were alone while data were collected. Generally, low use of strategies in this sub-category implies that the students depend only moderately on others in assisting them with a reading task. This also helps to confirm the nature of reading which has been described by Oxford (1990, p. 171) as ‘an independent activity’.



### **6.1.2 Is There any Relationship between the Students' Level of Reading Proficiency and the Types and Frequencies of Reading Strategies Reported?**

As discussed earlier in Chapter 2, early research on language learning strategies was carried out primarily to identify the strategies used by good language learners and to determine how these strategies can be taught to weaker learners. Some of the studies on language learning strategies include Naiman et al. (1978); Rubin (1975); and Stern (1975), while research on reading strategies was carried out by Block (1986, 1992) and Hosenfeld (1977, 1984).

It is pointed out by Cohen (1998) that effective use of strategies depends on a number of factors: the characteristics of the given learner, the given language structure(s), the given context, or an interaction of all these factors. Results from the present study suggest that students' level of proficiency plays a role to a certain extent in reflecting the students' choice and frequency in choosing particular strategies. Regardless of the students' reading ability, a similar order of importance was found to be cognitive, metacognitive, and social/affective strategies when required to read texts. This is with the exception of the results drawn from reading logs in which both metacognitive and cognitive strategies were used to the same degree followed by the use of social/affective strategies.

However, more proficient students in both experimental and control groups were found to report more use of metacognitive and cognitive strategies than those who were less proficient students. This is in accordance with Chamot and El-Dinary's (1999) proposal that the use of metacognitive strategies is a significant feature in reading, in that more proficient readers use these strategies more than those who are less proficient. More importantly, based on the data from the think-aloud verbal reports and reading logs, higher-proficiency readers generally reported the use of reading strategies in all major categories more frequently than those who are in the lower-proficiency level.

Based on questionnaires, although a significant relationship between the students' level of reading proficiency and the types and frequencies of reading strategies could not be established, some significant differences were found in a few strategies. For example, high-scoring students showed a preference for using the two strategies of "connect new information to old" and "make use of grammatical knowledge" more frequently than low-scoring students.



This suggests that more proficient students used background information to help their understanding of the text, while the opposite is true for less proficient readers who made less use of their own experience to help them read. Higher-proficiency students also made use of the knowledge they have about language to help them construct the meaning of the text while reading more frequently than their lower-proficiency peers.

In spite of the suggestions by Cohen (1998) and McDonough (1995) that strategies should not be viewed as good or bad and that they all have potential to be used more effectively in some tasks than others, the results from the main study show that there were some distinctive patterns of strategy use typically among two groups of students who are also referred to in the study as high- and low-scoring readers.

The most distinctive results between the two groups came from think-aloud verbal reports in which more proficient students made more frequent use of the following three sub-categories of M4 Self-monitoring, C8 Elaboration and M3 Selective attention, while less proficient readers showed more preference for using the sub-categories of C9 Transfer and C1 Resourcing.

According to the description provided in the study, M4 Self-monitoring refers to strategies readers use to regularly check their comprehension as well as appropriate strategies they use to deal with problems. Based on think-aloud data, the strategies used most often include “identify the source of reading problems”, “verify one’s understanding of the text” and “asking for information about the text”. The use of the first strategy was in line with Block’s (1992) research which found that proficient readers identify their reading problems and verbalise their strategic plans more frequently and explicitly than less proficient readers, while a study carried out by Padron and Waxman (1988) reveals that asking questions about the text is the most frequently cited strategy.

Concerning the cognitive strategy of Elaboration, the results in the study reveal that the students activate their known vocabulary as well as their existing knowledge constantly while reading to help them better understand the text. Students’ activation of their own experience coincides with comprehension-monitoring strategies proposed by Block (1986) in that readers use their knowledge and experience to help with clarifying content as well as reacting to content.



According to Block (1986), the strategies used by non-proficient readers fall into two major groups of integrators and nonintegrators. While the readers in the first group respond in an extensive mode by integrating information and monitoring their understanding constantly, the nonintegrators respond in a reflective mode by relying more on their personal experience to help them read and relate pieces of information together as they read. Distinction is also made between integrators and nonintegrators in that good readers relate associations more consistently to the information in the text. This is supported by Chamot and El-Dianry (1999, p. 330) in stating that, "Effective students may make more relevant and more extensive elaborations about a text than less effective students".

Think-aloud protocols reveal that more proficient readers "pay attention to key words" and "skip to the next sentence". According to Hosenfeld (1977, 1984), successful readers read in broad phrases and skip inessential words, while Knight et al. (1985) state that selective reading, which refers to the way readers pay attention to key words or interesting parts while ignoring others, has been ranked as one of the most useful strategies.

According to the literature, poor readers are described as those who use a limited set of strategies repeatedly although they are not effective, focus too much on details, and spend a considerable amount of time trying to figure out the meanings of difficult words. Based on think-aloud verbal protocols, this proves to be the case as the strategies used more frequently among low-scoring readers were mainly found in the cognitive sub-categories of C9 Transfer and C1 Resourcing which are reflected in the strategies of "translate into Thai" and "look up words in dictionary" respectively.

Based on the findings, less proficient readers spent a large amount of time translating word-by-word which suggests that they relied extensively on identifying word meanings rather than taking into account the overall meaning of the text. However, due to their limited knowledge of vocabulary, the meaning of the text was sometimes distorted and resulted in miscomprehension. The results coincide with Hosenfeld's (1977) study in that poor readers often translate in short phrases, and lose the overall meaning of sentences.

The strategy of looking up words in the dictionary among less proficient readers suggests that they rely on identifying all the unknown words they have found in the text as well as the fact they place equal emphasis on the new words without learning to ignore inessential words.



Vocabulary is one the concerns of less proficient readers when reading and they feel they have the need to look words up in the dictionary (Padron & Waxman, 1988). The findings coincide with the study carried out by Sheory and Mokhtari (2001) which reveals that ESL readers report more use of support mechanisms, e.g. using a dictionary and their dictionary use is (as one would expect) significantly more than native readers.

The results of the findings suggest that more efficient readers process a wide range of strategies and are more effective at monitoring and adapting their strategies while reading in comparison with less proficient readers. This agrees with the findings of Padron and Waxman (1988) which point out that there is a positive correlation between the students' English proficiency and the use of reading strategies.

### **6.1.3 What is the Difference in the Types and Frequencies of Reading Strategies Used over Time between the Experimental and the Control Groups?**

The results based on post-strategy questionnaires suggest that there were improvements in both groups. However, the students' mean score from the questionnaires in the experimental group improved more significantly than that of the control group, suggesting strategy training has an effect on promoting reading strategies. Most of the improved means scores derived from statements in the metacognitive category suggesting that the students were more aware of their comprehension and tried to monitor more while reading. On the other hand, the students' mean scores in the control group showed an insignificant gain. This suggests that as the students did not receive strategy training, they were not made aware of a wide range of strategies as well as their usefulness. Therefore, they did not make use of reading strategies as much as those students in the experimental group did.

Data based on think-aloud verbal reports suggest similar results of an overall increase of strategy use among both groups. In spite of the fact that the students in the experimental group used strategies more frequently than the control group on both occasions, their improved average score was found to be slightly lower than that of the control group in terms of frequency.



In comparison with the control group, higher frequency of strategy use was also found among the experimental group in both pre- and post-reading logs. However, after differences in mean scores between the two groups were compared, the average score of the students in the experimental group showed a slight drop in figures, while the control group gained marginal improvement in frequency indicating that they used reading strategies at a higher rate in their post-reading logs.

The findings discussed in this section so far have suggested the greater use of reading strategies across the three research tools was found among the students in the experimental group. Nonetheless, results based on think-aloud protocols and reading logs show that the students in the control group reported a higher frequency of strategy use after the instruction. Although the results seem conflicting, some logical interpretations can be drawn as follows.

Based on the results of the questionnaires, a significant increase in strategy use of the students in the experimental group but not in the control group suggests that it results from the effects of strategy training. As the students in the experimental group were introduced to a wide range of strategies which they could make use of while reading, this affects the way they responded to questionnaires resulting in an increased frequency of strategy use.

However, as most of the increased mean scores belonged to the category of metacognitive strategies, this suggests that the students in the experimental group were more aware of their comprehension and were able to access appropriate strategies to be employed after their training. This reflects an aspect of metacognition which is also described as “comprehension monitoring” by Casanave (1988). Metacognitive strategies are also referred to by Cohen (1990) as a set of strategies for supervising strategy use. They include “*planning* which strategies to use, *monitoring* how effective their use is, and *assessing* how effective their use was” (p. 91). Therefore, constant activation of metacognition among the students in the experimental group may explain why they used fewer strategies in comparison with the students in the control group as reflected in think-aloud protocols and their written accounts in reading logs.



Finally, this leads back to the discussion earlier about reading strategies which state they are neither good nor bad in themselves. It depends largely on how appropriately and effectively readers make use of them to maximise their understanding of the texts. This view is supported by Chamot and El-Dinary (1999) who state, “[The] appropriateness of the strategies used for a particular task or problems may be more important in effective L2 processing than the frequency or even the types of strategies used” (p. 327). Therefore, being taught how to use strategies properly helps students to be more selective in their strategy use but does not necessarily result in their increased use across the range of strategies.

#### **6.1.4 Does Strategy Training Help the Students in the Experimental Group to Improve Their Reading Proficiency Significantly?**

In the present study, reading strategy training was conducted through eight individual sessions throughout the academic term. Although reading texts to be taught relied on what is specified in the course book, the use of reading strategies was integrated and encouraged throughout the reading sessions.

This was carried out in five stages of Preparation, Presentation, Practice, Evaluation and Expansion as previously discussed in Chapter 3. The result of higher scores in the reading comprehension tests provided at the beginning and at the end of the instruction shows how successful the strategy training was. After the results of both sets of test scores were compared, it was found that the students in the experimental group significantly improved suggesting that strategy training has a positive effect on improving their reading ability.

The results are in line with other studies carried out in the field of reading strategy training including Auerbach & Paxton, 1997; Carrell et al., 1989; Dreyer & Nel, 2003; and Zimmerman, 1997. Moreover, the findings support Oxford’s (1990) claim that learning strategies are teachable and that strategy training is viewed as of necessity especially in the field of second or foreign language learning. As pointed out by Cohen (1998) and Oxford (1990), learners need to be guided and made aware of the wide range of strategies they can make use of through strategy training.



According to Cohen (1998), “learning will be facilitated if students are explicitly trained to become more aware of and proficient in the use of a broad range of strategies that can be utilised throughout the language learning process (p.66). Chamot et al. (1996) believe that strategy training is helpful in improving students’ learning, while instruction in reading strategies has an effect in facilitating students’ procedural knowledge (O’Malley and Chamot, 1990).

### **6.1.5 Do The Students in the Control Group Benefit from the Usual Approach to Teaching Reading in Improving Their Reading Proficiency?**

The students in the control group did not receive strategy training but were provided with their usual reading lessons based on a conventional text-based approach which consists of introducing a text to the students and following with a set of comprehension questions to complete. Although it is commonly practised in ESL/EFL reading classrooms around the world including Thailand, there are a number of concerns over the issues of not enough guidance having been provided in the reading process and the fact that answering comprehension questions correctly does not necessarily suggest successful reading (Ur, 1996).

After the students’ average pre- and post- scores were compared, the results revealed a significant improvement suggesting that the text-based approach also helps the students to improve their reading proficiency.

When lesson plans of both groups were reviewed, it was found that there are a number of similarities each reading lesson shared which are as follows. First, the same course book containing the same reading texts was used as part of reading lessons for both groups. Second, each reading lesson also incorporated aspects of reading skills as specified by the course syllabus and these skills needed to be taught to both groups. Therefore, it can be said that without strategy training, the students in the control group were taught through a combination of skills-based and text-based teaching. According to Nuttall (2000, p. 38), “Skills-based and text-based teaching are complementary” which may help to contribute to the success of the teaching of reading as well.



### **6.1.6 To What Extent Do the Students at Different Levels in Both Groups Benefit from the Two Different Teaching Approaches?**

The results based on the two previous research questions showed that there was some significant improvement in the average post-test scores in both groups. This last research question examines whether there is a significant difference among the three levels of reading scores, high, moderate and low in the two experimental and control groups.

For the experimental group, results of the One-Way Anova test suggest that the students at all levels received higher mean scores which indicate that they improved significantly in their reading proficiency through strategy training. Likewise, findings for the students in the control group also suggest that their reading mean scores improved significantly at all levels after text-based instruction. Thus, the findings from both groups suggest that strategy instruction as well as text-based instruction have positive effects in increasing the level of the students' reading ability.

In spite of the fact that the introduction of strategy instruction is considered to be new for both the researcher and the students, and was only introduced in a short period of time, it proved to be as effective as the existing text-based approach. In this respect, reading strategy instruction may have the potential to provide teachers as an alternative teaching method to choose from. Most importantly, both approaches can also be seen as complementary to be used in classrooms through the integration of reading skills as well as a repertoire of reading strategies.

As the major goal in language teaching practices has always been to enable learners to make progress in their learning, what can be drawn from the current findings is that both teaching approaches, strategy-based and text-based approaches, offer promising means of enhancing students' capacity in reading comprehension.

## **6.2 Implications for the Teaching of ESL/EFL Reading**

The results of this study yield insights into students' reading strategy use and into the conduct of strategy training from which the following implications can be drawn regarding the teaching of ESL/EFL reading.



### 6.2.1 A Shift to Strategy-Based Approach

As mentioned earlier in Chapter 1 the current study aims to explore an alternative teaching method for reading comprehension at tertiary level, the results of the study reveal that students' average scores in the experimental group improve significantly, suggesting that there was a positive effect of reading strategy training in enhancing students' reading ability. Therefore, integrating reading strategies as part of reading instruction is highly recommended.

Regarding the teaching of reading, Anderson (1999, p. 1) points out that one of ESL/EFL teachers' main considerations is how to best prepare students in a number of ways, some of which include "developing vocabulary skills, improving reading comprehension, improving reading rate, teaching readers how to successfully orchestrate the use of strategies and how to monitor their own improvement", while Aebersold & Field (1997, p. 30) hold the view that reading skills and strategies needed for success in academic situations may include the following reading activities of "being able to read long texts efficiently, being able to infer meaning, being able to interpret and understand ambiguity, and being able to recognize implicit meaning in texts." However, what determines the reading abilities the students need to develop depends on the goals of the course. After the goals have been established, reading teachers have to make decisions about what kind of teaching approaches to use in order to achieve the goals (Aebersold & Field, 1997).

Applying this to the present research context in Thailand, the goals of the English Foundation Courses are, firstly, to use English for communication, and secondly, to use English to help achieve personal and academic goals and to promote life-long learning. In order to achieve those goals, a text-based approach is practised among teaching staff in reading lessons, while the texts and reading skills to be taught are based on the coursebook. Generally, a reading excerpt introduces the theme of each chapter and is followed by a set of comprehension questions and exercises based on a particular reading skill which is the main focus of the chapter. Learning to read in this way is seen as "building up particular skills" although there is no convincing research evidence to support the notions that a hierarchy of skills does exist or that it enables readers to make gradual progress in becoming effective readers (Wallace, 1992, p. 54).



The alternative teaching method to a text-based approach is a strategy-based approach which views reading as a “unitary process which cannot be subdivided into constituent skills” (Wallace, 1992, p. 57). In a strategy-based approach, the processes readers use to reach the meaning of the text are as important as the products or the outcomes. This explains why early researchers (e.g., Hosenfeld, 1977, 1984) were interested in investigating what proficient second language reading processes involve as well as what strategies these readers employ when reading difficult texts so that it may give a clue to how less proficient readers can be helped.

As pointed out by Devine (1986), in order for readers to infer, make a prediction or hypothesise, they are required to utilise more advanced mental processes which are also referred to by cognitive psychologists as cognitive skills. The use of these cognitive skills is crucial and can have an influence on readers’ success or failure in their comprehension of the texts. Like other cognitive skills, reading strategies can be taught within the classroom context, a view which is supported by Cohen (1998) in stating that the strategies need to be explicitly explained, modelled, and embedded in a contextualised language setting by the teacher. Wallace (1998) stresses that the basic aim of strategy training is to raise readers’ awareness of their own thinking processes.

The need for a shift to a strategy-based approach also results from the fact that recent language learning has developed towards a ‘learner-centred’ approach in which learners are encouraged to take more responsibility for their own learning (Ur, 1996). According to Abersold and Field (1997), this approach has a number of advantages as it helps to make learners gain more confidence in making decisions about their own learning. In the long run, it enables learners to become more independent and self-reliant in their own learning while being less dependent on a teacher’s direction and supervision.

The shift from a text-based approach to a strategy-based approach brings about major changes to the teacher’s role in a number of ways. While learners become more independent in their own learning, the teachers’ new roles are to give more support to learners. As listed by Cohen (1998), some of the new roles include being diagnosticians, learner trainers or coaches as they are trying to help learners with the choice of strategies, train them or work with individual learners to develop which strategies work and which do not in particular circumstances. Therefore, the success of strategy training is a collaborative process between learners and teachers.



### 6.2.2 The Role of Metacognitive Awareness

After the choice of a strategy-based approach has been made, the next crucial question lies in what strategies are to be included in strategy training. Anderson (1999) proposes the ACTIVE framework to be taught in an ESL/EFL reading class which includes reading strategies in Activating prior knowledge, Cultivating vocabulary, Teaching for comprehension, Increasing reading rate, Verifying reading strategies and Evaluating progress. Urquhart and Weir (1998) suggest that the strategies of planning, monitoring and evaluation can be utilised by readers at pre-, during- and post- reading stages respectively. Although there is no empirical research to indicate what the “best” strategies are, one common view which is also supported by the results of the current study is that proficient students do regularly monitor their comprehension while reading.

Based on the data on think-aloud verbal reports, high-proficiency readers used the following metacognitive strategies at a higher rate in comparison with the low-proficiency readers: “recognise reading problems they are having” and “identify the source of reading problems” which were then followed by adopting other strategies to solve the problems they were experiencing.

As discussed in Section 2.3.3, metacognition helps to raise learners’ awareness of their cognitive processes and strategy use (Flavell, 1985). Nuttall (2000, p. 33) sees this ability to think about what is going on in their minds or metacognition as “a key factor in people’s capacity to develop as readers”. In order for learners to become conscious of their own reading processes, they need to be taught to do so while reading by using activities that will encourage them to ‘participate overtly in these processes’ (Aebersold & Field, 1997).

As suggested by Anderson and Vandergrift (1996), the think-aloud method which is used in various second language studies as a research tool to investigate students’ cognitive processes can also be used in reading classrooms. Some of the basic procedures include having the teacher demonstrate to the students how to verbalise based on a reading text which they have never read before so that it reflects a natural process. After that, the teacher encourages the students to have a think-aloud practice which can be carried out in pairs or in a group.



Furthermore, think-aloud protocols can be conducted in the classroom by asking students to stop and verbalise their processes after silent reading. Their verbal protocols can reflect how well they are monitoring their comprehension. According to Aebersold and Field (1997), readers need to constantly check to see if the strategies they are using are effective in enhancing their comprehension of the text and at the same time, they should be able to discuss with the teacher what strategies they are using. More importantly, when comprehension breaks down, students need to be able to check and “adjust the strategies they are using quickly and, eventually, automatically” ( p. 108).

In order to facilitate the process of developing their metacognitive awareness, students need to be taught how to do this. Although the procedures can be ‘intrusive’ at times, “the end result of engaging in such activities outweighs their inconvenient aspects” (Aebersold and Field, 1997, p. 97).

### **6.2.3 The Use of Authentic Materials**

Selecting appropriate materials is one the major decisions reading teachers have to make to match the course goals and the teaching approach that has been chosen (Aebersold & Field, 1997). Wallace (1992) emphasises the fact that the materials second language learners read vary according to the different learning purposes and objectives individuals have. However, readers should be encouraged to read for pleasure, while beginner readers should be introduced to a variety of interesting materials.

Williams and Moran (1989, p. 219) suggest a commonly accepted definition of an authentic text as, “a text not specially produced for language learners”, and according to Wallace (1992, p. 76), “It is often assumed that authentic texts are generally more interesting than those written for a pedagogic purpose.”

The use of authentic materials in the reading classroom has many advantages as they have the characteristics of true discourse, while simplified texts may not have these qualities. However, regarding this issue, Ur (1996) and Williams (1983) warn that with less proficient readers, the use of authentic texts may have their own limits and even be counter-productive if the level of language they employ leads to frustration on the part of the reader.



Nonetheless, the use of authentic materials in strategy-based teaching may motivate the students to read and employ strategies more effectively as the authentic presentation helps them to better establish the context, while the understanding of a text enables the students to relate it to their own learning or other personal purposes (Ur, 1996). Most important of all, authentic texts serve the purpose of 'real-life' reading (Nuttall, 2000) which according to Williams (1983, p. 175), include "reading for information, reading for interest, and reading for pleasure".

#### **6.2.4 The Benefits of Extensive Reading**

Two main approaches to reading are often referred to as intensive and extensive reading. While the focus of the first approach is on using short reading texts to teach students about reading skills and strategies, the latter requires students to read longer texts outside classroom (Eskey, 2002). According to Nuttall (2000), "Intensive and extensive reading are complementary and both are necessary, as well as other approaches which fit in neither category" (p. 38). This suggests that the teaching of reading should not rely on one single approach but a variety to facilitate the students' learning process.

Although the teaching approach in the current study reflects the nature of intensive reading, there is a need to promote extensive reading on the part of students. As discussed in Chapter 1, after first-year students have finished their English Foundation Courses or have gained required credits, they do not have to take other English courses until their graduation. However, as the need for them to read in English may arise at a later stage, students are required to be well prepared for the upcoming demand in reading with continued motivation to read. According to Wallace (1992, p. 71), "The more fluently and widely the second language reader reads, the more exposure to the key structures and vocabulary of the second language he or she gains."

Many people claim that "we learn to read by reading." This suggests the best way for learners to follow in order to gain high reading proficiency is extensive reading. Day and Bramford (1998, p. 167) state that the key components for extensive reading combine "a teacher's enthusiasm for reading and encouragement of students to read", while Kim and Krashen (1997) see the role of "free voluntary reading" as crucial in developing competence in second language learning.



According to Nuttall (2000), “We want students to read better: fast and with full understanding. To do this they need to read more, and there seems to be two ways to achieve this: requiring them to do so and tempting them to do so” (p. 128). While the first one mainly takes place in classroom through teaching, enjoyment in reading contributes to the success of the latter.

This agrees with Eskey (2002) who states that reading teachers have two main tasks. The first task involves introducing “students to appropriate texts-texts that are at the right level linguistically and are interesting and relevant to their needs-and to induce them to read such texts in quantity” (p. 9). The second task is the teaching of reading strategies in both bottom-up and top-down processing. With the knowledge of reading strategies, the students can make use of them as tools to facilitate their reading process and enable them to solve reading problems that come up. Eskey (2002, p. 9) sees these two tasks as complementary in that, “Students who enjoy reading are more likely to read successfully, and students who read successfully are more likely to enjoy it.” This is also referred to as “the virtuous circle of the good reader” by Nuttall (2000, p. 127).

Day and Bramford (1998, p. 41) suggest four ways of integrating extensive reading into second language reading programmes:

- as a separate, stand-alone course
- as part of an existing reading course
- as a non-credit addition to an existing course
- as an extracurricular activity

Although it is believed that well organized extensive reading programmes will help to enhance students’ reading capacity, there is a need for extensive reading to be integrated with other components of the language curriculum. According to Green (2005, p. 308), “It is a fundamental misconception to see it as a ‘stand-alone’ component.”

The setting up of extensive reading as a non-credit part of the existing course or an extracurricular activity proposed by Day and Bramford (1998) is of direct relevance to the researcher’s context. Although extensive reading has been promoted among first-year students through assigning short stories for them to read as part of the requirements of the English Foundation course as mentioned earlier in Chapter 1, a further step can be taken through promoting the use of SALC facilities where reading can be encouraged through self-directed reading materials, newspapers,



magazines or English websites. Most importantly, they should be motivated to read freely according to their interests.

Alternatively, an extracurricular reading club can be set up for students at all levels to join in. This type of extensive reading club can be run by a teacher who decides how many times the students come to meet after school. With more encouragement from the teacher, this will gradually bring some change to the students' roles and responsibilities in the long term (Green, 2005).

Additionally, extensive reading can also be enhanced through the post-reading stage of strategy training. This has reference to Table 3.14 in which students are encouraged to apply some of the strategies they have been taught to other reading situations outside the class as specified in the "evaluation" stage. This reading experience not only provides students opportunities to practice the use of reading strategies with authentic texts but also enables them to gain more authority and independence in managing their own reading process.

### **6.3 Limitations of the Study**

The limitations of the current study come from three main sources, firstly, limitations that derive from the nature of classroom research, secondly, the nature of experimental study, thirdly, the type of research tool used, i.e., think-aloud verbal reports.

Regarding the fact that the study took place in a real classroom setting, there are a number of restrictions which can be summarised as follows. First, as the English Foundation Course generally consists of integrated skills by nature, full concentration could not be given to one single skill. Therefore, reading strategy training occurred through teaching periods of reading which consisted of 8 sessions, 4 before the midterm test and another 4 after. Second, each reading session had to be completed within one and a half hours according to the regular timetable practised at Thammasat University. This caused difficulties from time to time as reading activities did not go according to plan or took longer than expected. Third, the researcher had no freedom in choosing reading texts to be taught but had to utilise texts prescribed in textbooks. This limits the range and choice of some reading strategies to be integrated as a variety of reading texts are needed in order to demonstrate how different strategies can be employed in various contexts.



Next, as experimental research, strategy training was a new concept to the researcher as well as to the students in the experimental group. As has been said, new ideas may not be welcome, and some of the students in the experimental group voiced their concerns over spending too much time on learning about reading strategies and not enough time on covering the rest of the course content. The researcher, therefore, had to explain the benefits of how reading strategies could be useful to them.

The third aspect that contributes to the limitations of the current study is the volume of work that is involved in transcribing and analysing think-aloud verbal data. This may have limited the number of students who took part in the study as well as limiting the range of reading strategies that could be explored. Moreover, the small number of participants (N= 8) has made it difficult to generalise the results to a wider context. Finally, a set of directions given to the students before think-aloud verbal reports took place may have had an effect on how the students approached and read the text in comparison to the way they normally read. In other words, the instructions might have influenced them to use strategies related to careful reading rather than expeditious reading.

Nonetheless, given the constraints of the above limitations, classroom research is useful in that it helps to reflect reading strategy training in practice, while the results can be directly applied to a real situation. Based on the researcher's personal experience of teaching the English Foundation Courses of Thammasat University, there is no reason to believe that the students who participated in the research were not typical.

#### **6.4 Recommendations for Further Research**

The present study can be taken as a starting point for similar research to be conducted, involving a larger number of both experimental and control groups as well as on a longer timeframe. This expansion of the scope could take place in the English Foundation Course offered across Thai universities, as well as in different ESL/EFL institutions or contexts other than Thailand. However, some major guidelines need to be set up, e.g. the length of the course, lesson plans, and handbooks to be used. Some other considerations also include what reading strategies to be included, as well as how they should be taught.



The current study has focused on three main categories which are metacognitive, cognitive, and social and affective strategies as proposed by O'Malley and Chamot (1990), based on which similar qualitative research tools, i.e., think-aloud verbal reports and reading logs were also analysed.

It is recommended that more research in similar categories should be carried out in the future across different contexts so that it might be possible to compare results and findings across studies. A more systematic compilation of reading strategies could be possibly established and serve as a basis for providing more successful strategy training in the future.

Moreover, although it is widely accepted that strategy training in reading helps to improve students' reading comprehension, not enough research has been carried out on a longitudinal basis. The conduct of further research to investigate the lasting effects of strategy training over a period of time would be extremely informative (Chen, 2007).

Finally, regarding the issue raised by Singhal (2000) that readers are different in their use of reading strategies, more qualitative research could be carried out focussing on the way particular groups of readers employ reading strategies when reading, i.e. ESL vs EFL readers, more and less proficient readers. In-depth investigations into the use of reading strategies and their findings should help to shed some light on factors that influence or impede strategy use and contribute to ESL/EFL reading instruction.

## **6.5 Conclusion**

The discussion in this final chapter has included four main aspects of analysis of the findings in response to the research questions, followed by implications for the teaching of ESL/EFL reading, the limitations of the current study and recommendations for further research. It is hoped that the current research has shed some light on the effects of reading strategy training and encouraged reading teachers as well as researchers to further pursue its contribution to the ESL/EFL classroom.



The researcher strongly believes that the ultimate goal of language learning and teaching is to equip learners by providing them with tools they can make use of in constantly seeking knowledge. Therefore, in order to accomplish this goal, learners have to be well-equipped with learning tools for use outside the classroom context.

The outcome will be rewarding for both teachers and learners in the long term. While a shift to a reading strategy-based approach brings teachers a step closer to achieving the goal of promoting life-long learning, the results of strategy training will enable the students to continue their learning after leaving the language classroom.

To finish with one of the students' comments from the questionnaire given at the end of the strategy instruction,

In the past, the importance of reading was neglected as I read poorly. Personally, I didn't like to read anything in English. The introduction of the use of reading strategies has enabled me to read better and understand more. I can apply the use of strategies to intensive as well as extensive reading. Now, I can have fun with reading. Learning how to use reading strategies is not as hard as I thought. I have more courage to read all the materials around me, newspapers, magazines, or even songs in English. Reading is not as difficult as it used to be.



**APPENDICES**



**APPENDIX A: Consent Form**



## Consent form

This is to certify that I, ..... , hereby agree to participate in a study as an authorised part of the research undertakings within the Department of Linguistics and English Language at the University of Wales, Bangor.

I understand that I am free to withdraw my consent and terminate my participation at any time without penalty.

I understand that I may request a summary of the results of the study.

.....  
Date

.....  
Participant's signature

Complaints about the conduct of this research should be addressed to Dr. Eddie Williams, Senior Lecturer, University of Wales, Bangor, LL57 2DG.



**APPENDIX B: Reading Strategy Questionnaire**



## B.1 Reading Strategy Questionnaire - English Version

**Dear students,**

The purpose of this questionnaire is to investigate the reading strategies you use when reading English texts.

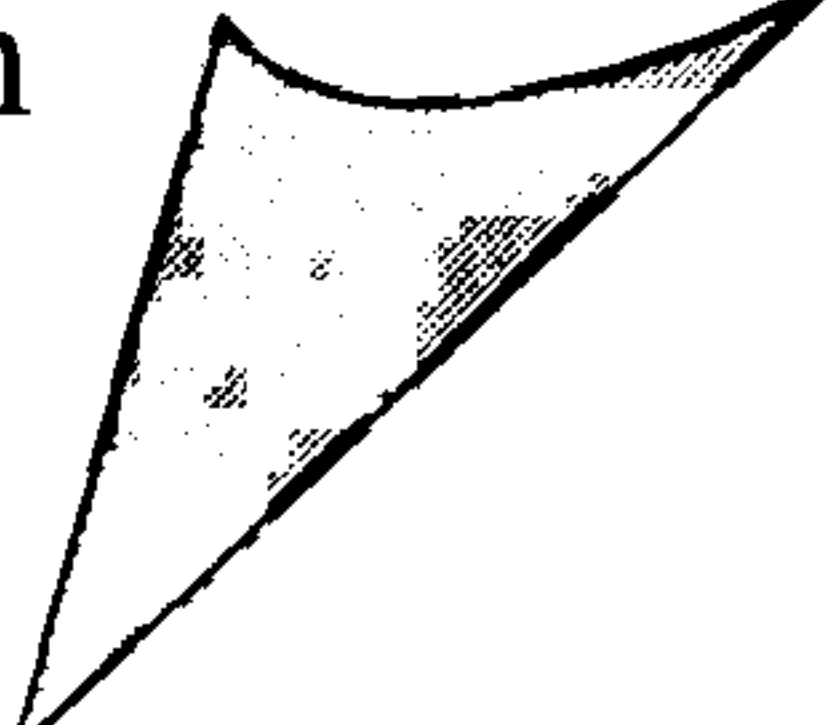
The questionnaire consists of three parts:

- Part I:**           General information
- Part II:**         Reading strategy questionnaire
- Part III:**        Open-ended questions

Please note that there is no right or wrong answer to these statements.

Thank you for your cooperation.

Pattama Sappapan  
(Researcher)



### Part I: General Information

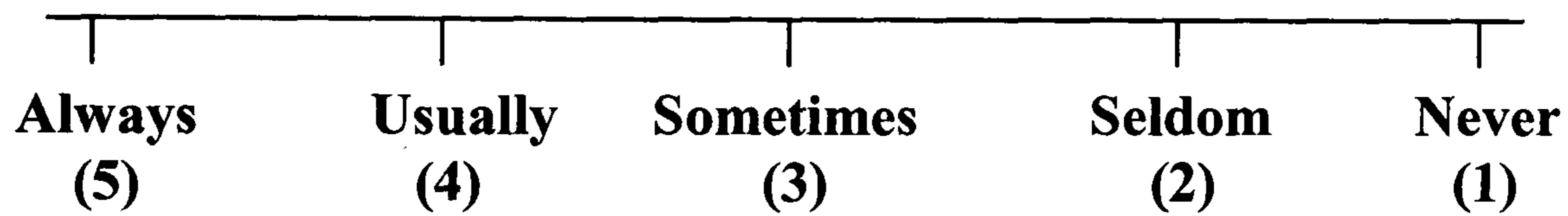
1. Name: \_\_\_\_\_
2. Sex:
  - 1. Female
  - 2. Male
3. Age: \_\_\_\_\_
4. Faculty: \_\_\_\_\_
5. Previous grade in EL 171: \_\_\_\_\_
6. Number of years studying English: \_\_\_\_\_



## Part II: Reading Strategy Questionnaire

Please read each sentence carefully and answer it in terms of how often you do as stated when reading English texts. Then, put a cross ( X ) in the right box.

- 5 = Always  
 4 = Usually  
 3 = Sometimes  
 2 = Seldom  
 1 = Never



### Example:

How well does the following statement describe you as a reader when reading English texts?	(5)	(4)	(3)	(2)	(1)
I do not read aloud.	X				

How well do the following statements describe you as a reader when reading English texts?	(5)	(4)	(3)	(2)	(1)
1. I skim read the text at least once to find its general idea.					
2. I try to think about the related vocabulary I know before I start to read.					
3. I look up the words I don't know in a dictionary.					
4. If I don't understand the text, I ask the teacher to explain it to me.					
5. I have a purpose before I start to read.					
6. I tell myself it's alright not to understand everything I am reading.					
7. I try to recognize the author's opinion, tone and purpose.					



Always (5)	Usually (4)	Sometimes (3)	Seldom (2)	Never (1)
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<b>How well do the following statements describe you as a reader when reading English texts?</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>
8. I make use of my experience to help me understand what I am reading.					
9. If appropriate, I underline or highlight important parts in the text I am reading.					
10. I reread if I don't understand.					
11. After reading, I evaluate if my reading purpose is met.					
12. I draw numbers or diagrams to represent the key concepts of what I am reading.					
13. I ask my friends for help with the vocabulary or translation of the reading texts I don't understand.					
14. I read headings and sub-headings before attempting the content of the text.					
15. I try to connect new information to the information I already know.					
16. I put a '?' in front of the sections I don't understand so that I can come back to read them again.					
17. If I don't comprehend what I am reading, I try to identify what the problems are about.					
18. I guess word meanings by using contexts.					
19. When appropriate, I try to create an image of what I am reading.					
20. I ask myself if the reading strategies I chose are effective.					
21. I think about how I am going to read a text.					
22. After reading, I check if my prior guess about the title is correct.					
23. I find it helpful to read and exchange different pieces of information in a group within the classroom.					
24. If I am reading difficult texts, I try to read them more slowly and carefully.					
25. I write a summary of what I have read.					



Always (5)	Usually (4)	Sometimes (3)	Seldom (2)	Never (1)
---------------	----------------	------------------	---------------	--------------

<b>How well do the following statements describe you as a reader when reading English texts?</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>
26. I use illustrations (e.g. pictures, graphs) to help me understand the content of the text better.					
27. Before reading, I preview the text for its organization (e.g. narratives, comparisons).					
28. I pronounce new words many times to help me remember them.					
29. I ask myself if I understand what I am reading.					
30. I make use of my grammatical knowledge of English to analyze difficult sentences.					
31. I guess what a passage is about from its title.					
32. I think about how well I understand the text I have just read.					
33. When reading English texts, I apply the same reading techniques as when I read in Thai.					
34. If appropriate, I try to take notes while reading.					
35. I use my imagination to help me understand the situation in the texts.					
36. I tell myself the text may not be as difficult as it looks.					
37. I ignore unimportant details.					
38. I look for key words in a passage which signal what it is about.					
39. I relate the sound of some new words to the Thai words I know so that I can recall them later.					
40. I tell myself if I try harder, I can become a more successful reader.					
41. I scan for specific information.					
42. I ask myself questions about the content of the text while reading.					
43. While reading, I try to understand how the things are grouped together.					
44. I translate what I am reading into Thai.					
45. I make predictions about what will come next in the text while I read.					



### Part III: Open-ended Questions (Pre-instruction)

Please read the following questions carefully and answer them all.

1. How would you describe yourself as a reader in Thai? Put a cross ( X ) in the right box.  
 Proficient     Good     Moderate     Weak     Extremely poor
2. How would you describe yourself as a reader in English? Put a cross ( X ) in the right box.  
 Proficient     Good     Moderate     Weak     Extremely poor
3. Apart from the strategies referred to in Part II, are there any other things you do when reading English texts which you find useful? If so, please describe them briefly.

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4. What are some of the reading skills (i.e. guessing unknown words, reading for main ideas, skimming, scanning, etc.) you think you are already good at?

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5. What are some of the reading skills (i.e. guessing unknown words, reading for main ideas, skimming, scanning, etc.) in which you think you need to get more practice in class?

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6. Do you think learning how to read effectively will be useful to you in your future studies? Why?

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**Thank you for your cooperation**





## B.2 Reading Strategy Questionnaire - Thai Version

### เรียนนักศึกษา

แบบสอบถามฉบับนี้ มีวัตถุประสงค์เพื่อศึกษากลวิธีการอ่าน (Reading Strategies) ของนักศึกษา ในขณะที่อ่านบทความที่มีเนื้อหาเป็นภาษาอังกฤษ (English texts)

แบบสอบถามฉบับนี้มีประกอบด้วย 3 ตอน:

- ตอนที่ 1: ข้อมูลทั่วไปของนักศึกษา
- ตอนที่ 2: กลวิธีการอ่าน
- ตอนที่ 3: ความคิดเห็นต่อการอ่าน

กรุณาตอบตามคำถามทุกข้อตามความเป็นจริง  
คะแนนใดๆทั้งสิ้น

คำตอบของนักศึกษาไม่มีผลต่อ

ขอขอบคุณที่ให้ความร่วมมือ

ปัทมา สัมปพันธ์  
(ผู้วิจัย)

### ตอนที่ 1: ข้อมูลทั่วไปของนักศึกษา

1. ชื่อ : \_\_\_\_\_
2. เพศ :  
( ) 1. หญิง ( ) 2. ชาย
3. อายุ : \_\_\_\_\_ ปี
4. คณะ : \_\_\_\_\_
5. ผลการเรียนวิชา EL 171: \_\_\_\_\_
6. จำนวนปีที่เรียนภาษาอังกฤษ: \_\_\_\_\_



## ตอนที่ 2: กลวิธีการอ่าน

กรุณาอ่านแต่ละประโยคอย่างระมัดระวัง และเลือกตอบว่านักศึกษาปฏิบัติตามข้อความ ที่ระบุไว้ในแต่ละข้อ บ่อยครั้งเพียงใด ขณะอ่านบทอ่านที่มีเนื้อหาเป็นภาษาอังกฤษ แล้วจึงใส่เครื่องหมายกากบาท ( X ) ในช่องที่ นักศึกษาเลือก

5	=	เป็นประจำ
4	=	บ่อยครั้ง
3	=	เป็นบางครั้ง
2	=	ไม่บ่อยนัก
1	=	ไม่เคย

เป็นประจำ	บ่อยครั้ง	เป็นบางครั้ง	ไม่บ่อยนัก	ไม่เคย
(5)	(4)	(3)	(2)	(1)

### ตัวอย่าง:

ท่านปฏิบัติตามข้อความที่ระบุไว้ในแต่ละข้อบ่อยครั้งเพียงใด ในขณะที่อ่าน บทอ่านที่มีเนื้อหาเป็นภาษาอังกฤษ	(5)	(4)	(3)	(2)	(1)
ข้าพเจ้าไม่อ่านออกเสียงดัง	X				

ท่านปฏิบัติตามข้อความที่ระบุไว้ในแต่ละข้อบ่อยครั้งเพียงใด ในขณะที่อ่าน บทอ่านที่มีเนื้อหาเป็นภาษาอังกฤษ	(5)	(4)	(3)	(2)	(1)
1. ข้าพเจ้าอ่านบทอ่านอย่างน้อยหนึ่งเที่ยว เพื่อดูว่าเป็นเรื่องเกี่ยวกับอะไร					
2. ก่อนอ่านทุกครั้ง ข้าพเจ้าพยายามคิดถึงคำศัพท์ที่ข้าพเจ้ารู้จัก เกี่ยวข้องกับ เนื้อเรื่องนั้นๆ					
3. ข้าพเจ้าเปิดหาความหมายคำศัพท์ที่ข้าพเจ้าไม่ทราบจากพจนานุกรม					
4. หากข้าพเจ้าไม่เข้าใจเรื่องที่อ่าน ข้าพเจ้าจะถามครูเพื่อให้อธิบาย					
5. ข้าพเจ้าตั้งจุดประสงค์ก่อนการอ่านทุกครั้ง					
6. ข้าพเจ้าคิดว่า ข้าพเจ้าไม่จำเป็นต้องเข้าใจสิ่งที่อ่านทั้งหมด					
7. ข้าพเจ้าพยายามอ่านเพื่อทำความเข้าใจว่า ความคิดเห็น, น้ำเสียง (Tone) และ วัตถุประสงค์ของ ผู้เขียนคืออะไร					



เป็นประจำ (5)	บ่อยครั้ง (4)	เป็นบางครั้ง (3)	ไม่บ่อยนัก (2)	ไม่เคย (1)
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ท่านปฏิบัติตามข้อความที่ระบุไว้ในแต่ละข้อบ่อยครั้งเพียงใด ในขณะที่อ่าน บทอ่านที่มีเนื้อหาเป็นภาษาอังกฤษ	(5)	(4)	(3)	(2)	(1)
8. ข้าพเจ้าพยายามใช้ประสบการณ์ของตนเอง ในการช่วยทำความเข้าใจ เรื่องที่กำลังอ่าน					
9. ในกรณีที่อ่านหนังสือของข้าพเจ้าเอง ข้าพเจ้าจะขีดเส้นใต้ หรือ ระบายสี เน้นข้อความสำคัญในขณะที่อ่าน					
10. หากข้าพเจ้าไม่เข้าใจในเรื่องที่อ่านอยู่ ข้าพเจ้าจะอ่านใหม่อีกครั้ง					
11. หลังจากอ่านจบแล้ว ข้าพเจ้าประเมินว่าข้าพเจ้าได้บรรลุวัตถุประสงค์ที่ วางไว้หรือไม่					
12. ข้าพเจ้า เขียนตัวเลข หรือ แผนภูมิ (Diagrams) เพื่อแสดงประเด็น สำคัญของเรื่องที่ข้าพเจ้ากำลังอ่าน					
13. ข้าพเจ้าถามคำศัพท์จากเพื่อนหรือให้เพื่อนช่วยแปล เมื่อข้าพเจ้าไม่ เข้าใจเรื่องที่อ่าน					
14. ข้าพเจ้าจะอ่านหัวเรื่องใหญ่ และหัวเรื่องรอง ก่อนที่จะอ่านเนื้อเรื่อง					
15. ข้าพเจ้าพยายามเชื่อมโยงความรู้ใหม่ เข้ากับความรู้เดิมของข้าพเจ้า					
16. ข้าพเจ้าใส่เครื่องหมายคำถาม '?' ไว้หน้าส่วนหรือตอนที่ข้าพเจ้าไม่ เข้าใจ เพื่อจะได้กลับมาอ่านอีกครั้ง					
17. หากข้าพเจ้าไม่เข้าใจในเรื่องที่กำลังอ่าน ข้าพเจ้าจะพยายามหาสาเหตุ ของปัญหา					
18. ข้าพเจ้าเดาความหมายของคำศัพท์โดยใช้บริบท (Context)					
19. หากเป็นไปได้ ข้าพเจ้าพยายามสร้างจินตภาพของเรื่องที่กำลังอ่าน					
20. ข้าพเจ้าถามตนเองว่า กลวิธีในการอ่าน (Reading Strategies) ที่ ข้าพเจ้าใช้นั้น มีประสิทธิภาพหรือไม่					
21. ก่อนเริ่มอ่านบทอ่านทุกครั้ง ข้าพเจ้าจะคิดก่อนว่า ข้าพเจ้าจะอ่าน บทอ่านนั้นอย่างไร					
22. หลังจากอ่านจบแล้ว ข้าพเจ้าตรวจสอบว่าสิ่งที่ข้าพเจ้าคาดเดาจากชื่อ เรื่องไว้ ถูกต้องหรือไม่					
23. ข้าพเจ้าชอบที่จะอ่านและแลกเปลี่ยนข้อมูลกับเพื่อนในกลุ่มขณะเรียน ในชั้น					
24. หากเรื่องที่ข้าพเจ้าอ่านเป็นเรื่องที่ยาก ข้าพเจ้าจะพยายามอ่านให้ช้าลง และระมัดระวังมากขึ้น					
25. ข้าพเจ้าเขียนสรุปย่อเรื่องที่ข้าพเจ้าได้อ่านไปแล้ว					



เป็นประจำ	บ่อยครั้ง	เป็นบางครั้ง	ไม่บ่อยนัก	ไม่เคย
(5)	(4)	(3)	(2)	(1)

ท่านปฏิบัติตามข้อความที่ระบุไว้ในแต่ละข้อบ่อยครั้งเพียงใด ในขณะที่อ่าน บทอ่านที่มีเนื้อหาเป็นภาษาอังกฤษ	(5)	(4)	(3)	(2)	(1)
26. ข้าพเจ้าใช้ส่วนประกอบที่มาคู่กับบทอ่าน (เช่น รูปภาพ หรือ แผนภูมิ) เพื่อช่วยให้ข้าพเจ้าเข้าใจเนื้อหาของบทอ่าน ได้ดีขึ้น					
27. ก่อนอ่านทุกครั้ง ข้าพเจ้าจะอ่านสำรวจอย่างคร่าวๆ เพื่อให้ทราบแนว การเขียนว่าเป็นรูปแบบใด (เช่น เขียนเพื่อเล่าเรื่อง หรือ เพื่อเปรียบเทียบ)					
28. ข้าพเจ้าออกเสียงคำศัพท์ใหม่ซ้ำหลายๆครั้ง เพื่อช่วยในการจำ					
29. ขณะอ่าน ข้าพเจ้าถามตัวเองว่า เข้าใจในสิ่งที่กำลังอ่านอยู่หรือไม่					
30. ข้าพเจ้าใช้ความรู้ด้าน ไวยากรณ์ภาษาอังกฤษ ในการวิเคราะห์โครงสร้าง ประโยคที่เข้าใจยาก					
31. ก่อนอ่านทุกครั้ง ข้าพเจ้าจะพยายามเดาเรื่องจากชื่อเรื่อง					
32. ข้าพเจ้าคิดทบทวนว่า ข้าพเจ้าเข้าใจเรื่องที่อ่านไปแล้วมากน้อยเพียงไร					
33. เมื่ออ่านบทอ่านที่เป็นภาษาอังกฤษ ข้าพเจ้าใช้กลวิธีในการอ่าน เช่นเดียวกับการอ่านบทอ่านที่เป็นภาษาไทย					
34. ข้าพเจ้าพยายามจดบันทึกประเด็นสำคัญของเรื่อง (Take notes) ในขณะที่อ่าน					
35. ข้าพเจ้าใช้จินตนาการ ช่วยในการทำความเข้าใจสถานการณ์ของเรื่องที่ อ่าน					
36. ข้าพเจ้าพยายามบอกกับตัวเองว่า บทอ่านที่เห็นอาจไม่ยากอย่างที่คิด					
37. ข้าพเจ้าจะไม่สนใจอ่านรายละเอียดที่ไม่สำคัญ					
38. ข้าพเจ้าจะมองหาคำหลัก (Key words) จากเรื่องที่อ่าน เพื่อช่วยให้ ทราบว่ากำลังอ่านเรื่องอะไร					
39. ข้าพเจ้าโยงเสียงของคำศัพท์ใหม่ให้เข้ากับเสียงของคำในภาษาไทยที่ ข้าพเจ้ารู้จัก เพื่อช่วยให้จำได้ดีขึ้น					
40. ข้าพเจ้าบอกกับตัวเองว่า หากข้าพเจ้าพยายามให้มากกว่านี้ ข้าพเจ้าก็จะ เป็นนักอ่านที่ประสบความสำเร็จได้					
41. ข้าพเจ้าอ่านข้าม (Scan) เพื่อหาข้อมูลที่ต้องการทราบเท่านั้น					
42. ข้าพเจ้าตั้งคำถามตัวเอง เกี่ยวกับเนื้อหาของเรื่องที่กำลังอ่าน					
43. ขณะอ่าน ข้าพเจ้าพยายามเข้าใจความสัมพันธ์ของข้อมูลที่ได้จัดไว้ใน กลุ่มเดียวกัน					
44. ข้าพเจ้าแปลสิ่งที่อ่านจากภาษาอังกฤษเป็นภาษาไทย					
45. ข้าพเจ้าใช้วิธีคาดเดาเนื้อเรื่องในขณะที่อ่าน					







**APPENDIX C: Statistics on the Reading Strategy Questionnaire**



## C.1 Piloted Questionnaire: Reliability & Item-Total Statistics

### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.767	.775	45

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
v1	145.95	160.646	.090	.768
v2	147.67	154.750	.268	.762
v3	146.28	157.817	.210	.764
v4	147.38	152.029	.428	.755
v5	147.40	151.542	.505	.753
v6	146.19	166.297	-.143	.781
v7	146.33	156.961	.253	.762
v8	145.86	157.630	.263	.762
v9	146.02	154.719	.270	.761
v10	145.55	159.655	.198	.764
v11	147.36	153.077	.445	.756
v12	147.76	151.625	.411	.755
v13	146.60	158.033	.174	.765
v14	145.84	159.853	.100	.768
v15	146.26	156.651	.243	.763
v16	146.84	153.116	.298	.760
v17	146.84	156.133	.254	.762
v18	145.66	158.651	.261	.763
v19	146.16	154.835	.290	.761
v20	147.22	156.528	.228	.763
v21	147.36	154.446	.318	.760
v22	146.69	155.306	.295	.761
v23	147.22	156.142	.308	.761
v24	145.47	158.639	.256	.763
v25	147.48	157.833	.166	.766
v26	146.40	155.331	.258	.762
v27	146.45	161.690	.028	.771
v28	147.02	157.456	.189	.765
v29	146.03	155.578	.303	.760
v30	146.72	151.291	.383	.756
v31	146.29	155.018	.337	.759



	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
v33	146.79	161.009	.055	.770
v34	147.21	150.483	.428	.754
v35	145.86	157.139	.253	.762
v36	146.93	156.943	.216	.764
v37	146.90	161.252	.047	.770
v38	145.93	158.100	.220	.764
v39	147.31	159.060	.108	.769
v40	146.17	157.163	.241	.763
v41	146.31	162.323	.007	.771
v42	147.26	158.265	.264	.763
v43	146.72	156.519	.283	.761
v44	146.66	156.897	.183	.765
v45	146.12	157.476	.208	.764

## C.2 Pre-Post Questionnaire: Reliability & Item-Total Statistics

### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.9413	.9421	90

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A1	308.23	1081.063	.419	.940
A2	309.30	1073.875	.486	.940
A3	308.02	1093.101	.313	.941
A4	309.25	1083.445	.452	.940
A5	309.50	1077.169	.585	.940
A6	308.47	1107.779	.038	.942
A7	308.57	1082.012	.451	.940
A8	307.72	1085.054	.487	.940
A9	308.10	1090.566	.319	.941
A10	307.48	1089.949	.492	.940
A11	309.27	1079.046	.524	.940
A12	309.80	1087.281	.338	.941
A13	308.35	1097.181	.212	.941
A14	308.02	1085.000	.394	.941



A15	308.33	1086.565	.383	.941
A16	309.25	1073.072	.428	.940
A17	308.82	1085.983	.430	.940
A18	308.23	1084.894	.473	.940
A19	308.22	1081.562	.460	.940
A20	309.08	1076.145	.476	.940
A21	309.13	1077.101	.509	.940
A22	308.92	1078.518	.480	.940
A23	309.02	1082.322	.445	.940
A24	307.70	1092.892	.345	.941
A25	309.48	1089.813	.347	.941
A26	308.13	1094.151	.247	.941
A27	308.67	1079.107	.537	.940
A28	308.92	1073.773	.502	.940
A29	308.17	1078.751	.505	.940
A30	308.88	1079.461	.418	.940
A31	308.40	1072.142	.600	.940
A32	308.25	1078.326	.507	.940
A33	308.65	1107.113	.079	.942
A34	309.20	1087.010	.409	.941
A35	307.98	1083.983	.476	.940
A36	308.95	1076.387	.458	.940
A37	309.22	1113.291	-.046	.942
A38	308.07	1093.419	.312	.941
A39	309.35	1078.265	.430	.940
A40	308.25	1079.648	.445	.940
A41	308.52	1113.983	-.057	.942
A42	308.88	1080.783	.527	.940
A43	308.83	1081.158	.560	.940
A44	308.10	1081.651	.408	.941
A45	308.15	1086.096	.415	.940
B1	307.97	1088.168	.363	.941
B2	308.85	1085.316	.419	.940
B3	308.08	1109.095	.021	.942
B4	309.20	1089.654	.402	.941
B5	309.18	1086.390	.396	.941
B6	308.27	1108.233	.058	.942
B7	308.35	1091.994	.392	.941
B8	307.55	1083.201	.583	.940
B9	307.98	1086.966	.364	.941
B10	307.60	1093.431	.383	.941
B11	308.88	1082.512	.567	.940
B12	309.53	1101.745	.141	.942
B13	308.25	1107.581	.048	.942
B14	307.58	1090.688	.459	.940
B15	307.92	1079.434	.513	.940
B16	308.73	1073.690	.506	.940
B17	308.70	1094.756	.309	.941
B18	308.32	1089.135	.384	.941
B19	308.05	1087.540	.377	.941
B20	308.97	1094.541	.376	.941



B21	309.07	1076.673	.521	.940
B22	308.70	1081.569	.458	.940
B23	308.78	1085.122	.403	.941
B24	307.68	1101.373	.199	.941
B25	309.42	1089.671	.376	.941
B26	307.83	1088.819	.383	.941
B27	308.43	1080.250	.590	.940
B28	308.87	1086.592	.323	.941
B29	308.12	1100.444	.195	.941
B30	308.48	1083.271	.421	.940
B31	308.23	1081.843	.462	.940
B32	308.23	1078.826	.601	.940
B33	308.55	1095.913	.239	.941
B34	309.15	1081.011	.423	.940
B35	307.92	1089.196	.375	.941
B36	308.78	1094.342	.352	.941
B37	308.82	1112.220	-.026	.942
B38	308.22	1086.952	.398	.941
B39	309.08	1088.552	.292	.941
B40	308.05	1078.082	.513	.940
B41	308.12	1097.223	.242	.941
B42	308.88	1085.257	.512	.940
B43	308.75	1087.784	.440	.940
B44	308.03	1092.473	.256	.941
B45	308.02	1100.762	.181	.941

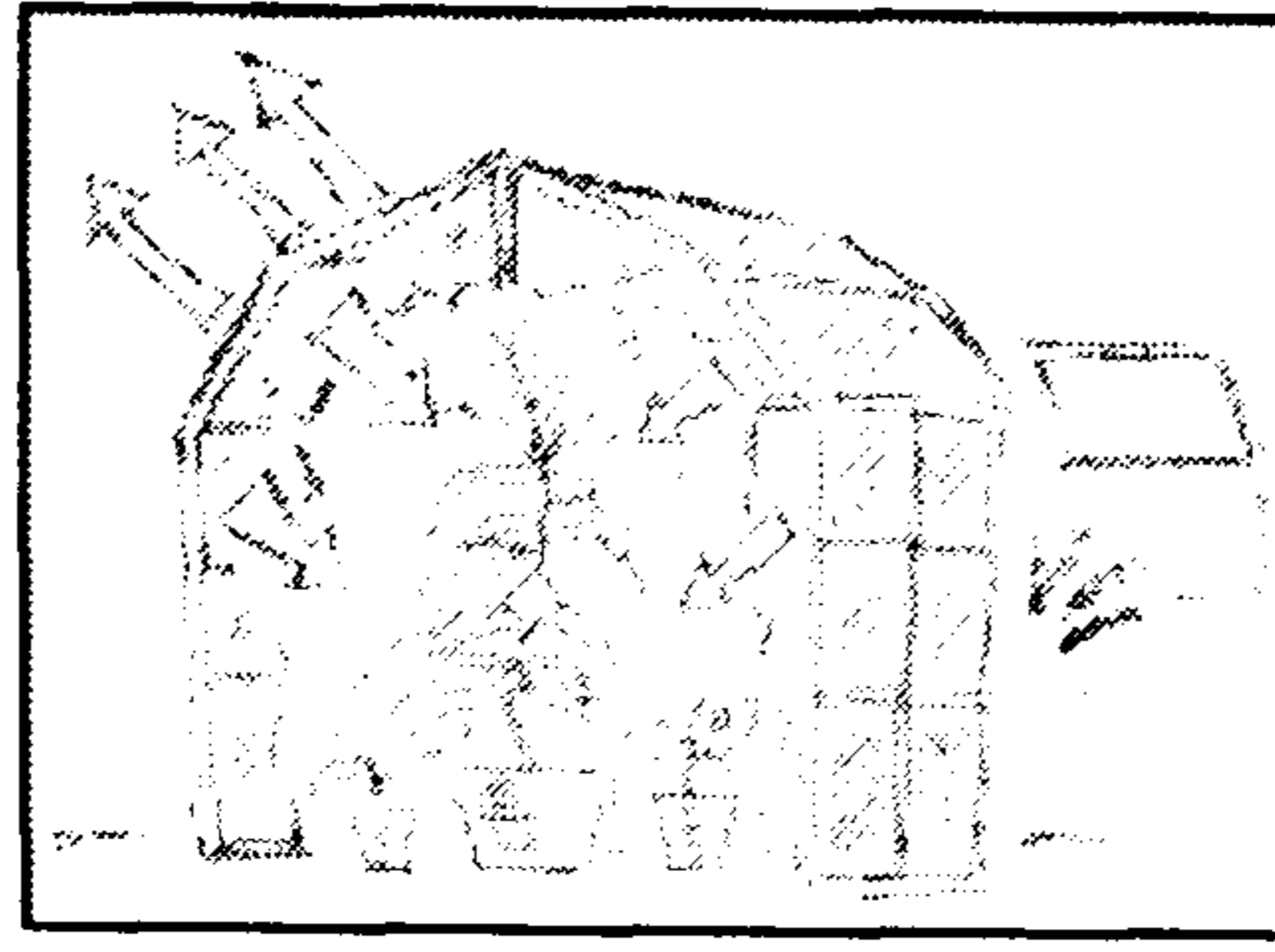


**APPENDIX D: Think-Aloud Reading Text and Other  
Related Materials**



## D.1 Think-Aloud Text 1

**Did you know we live in a GREENHOUSE? □**



### **Earth in a Greenhouse?**

You probably know that flowers, fruit and vegetables can be grown in a greenhouse, but did you know that we humans also live in a greenhouse? □

Of course we are not surrounded by glass. □ We are surrounded by a blanket of air called the atmosphere which has kept the temperature on Earth just right for centuries. □

Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm. □ We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things. □

The average temperature of the Earth's surface with the greenhouse effect is 15 degrees Celsius. □ Without the natural greenhouse effect, the temperature would be -18 degrees Celsius. □

### **The Greenhouse Effect and Global Warming □**

For hundreds of years the Earth's atmosphere has changed very little. □ It has kept the right temperature for plants and animals, including humans, to survive quite comfortably. □

Many scientists now believe that the addition of greenhouse gases from human or manmade sources is throwing our atmosphere and the natural greenhouse effect out of balance. □ It would appear that the atmosphere is trapping too much heat and causing the Earth to heat up. This is known as GLOBAL WARMING. □



**Did You Know?** □

Some of our energy sources, known as fossil fuels, have been trapped beneath the ground for millions of years:

- coal
- oil
- natural gas. □

They release energy when they are burned. □ They also release large quantities of greenhouse gases. □ Plants and trees are natural regulators of the atmosphere. □ They help keep things in balance. □ Destroying our forests, or **deforestation**, upsets this balance and actually results in increasing amounts of carbon dioxide in the atmosphere. □

**What's Wrong with Global Warming?** □

The fact of the matter is that global warming could easily mean changes to our daily lives. □ If the global warming trend continues, we may experience shorter, warmer winters, and longer hotter summers. □

**You Want to Help?** □

So what can you do about global warming? First of all, think about what causes global warming. □ If burning fossil fuels adds greenhouse gases to the atmosphere, we should find ways to use these fuels more efficiently. □ If cutting down forests and trees aids global warming, we should be sure to plant a new tree for every one that is cut down or burned. □

Decide how you can help. □ It may be as simple as sharing the information you learned in this paper with your neighbours and friends it's a start!! □ Many people don't understand the greenhouse effect and global warming. □ You can help them learn. □ If you can't decide where to begin, here's **TWO SIMPLE THINGS YOU CAN DO TO HELP STOP GLOBAL WARMING...** □

1. Turn off unnecessary lights. □
2. Walk, ride your bike or take the bus more often. □

**(Adapted from: <http://www.ns.ec.gc.ca/udo/green.html>)**



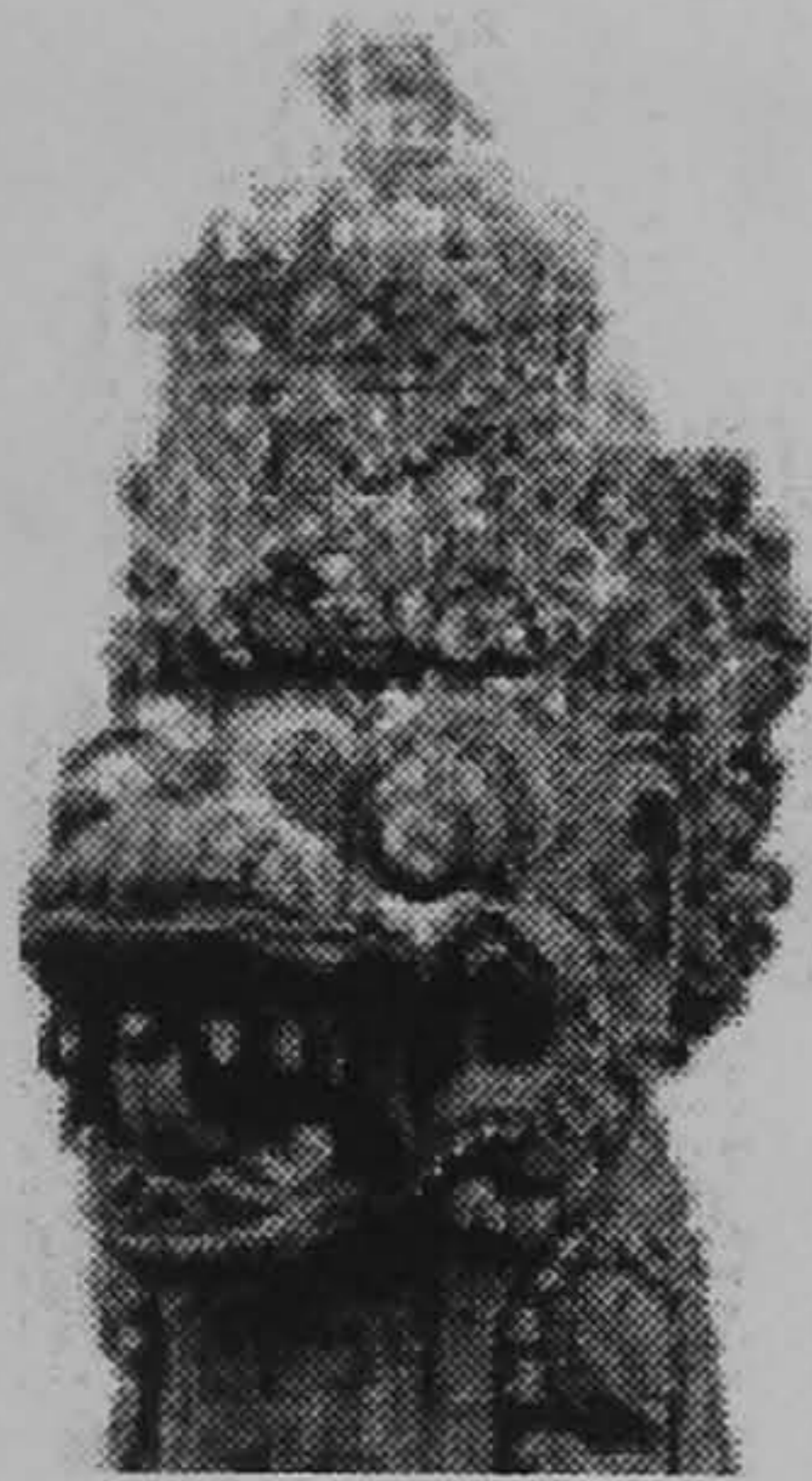
## D.2 Think-Aloud Text 2



Introduction || Geography || Transportation || Hotels || Shopping || Tours ||  
Exploring Bali beaches|| Place of Interest

### Bali Travel Information □

#### Introduction □



There is a legend told of an island east of Java. □ It was a beautiful island, but its fertile plains and palm fringed shores rocked and were unsteady. □ The gods conferred. □ They decided the answer lay in placing a mountain upon the island, to balance, calm and soothe it. □

And so they did. □ Happiness then reigned on the island and all was at peace. □ The mountain was called Great Mountain - **GUNUNG AGUNG** - and the island is **BALI**, "**The Morning of the World**", a magical island full of legends and mystical tales set amid the thousands of islands that are **INDONESIA**. □

#### Geography □

Bali is one of the 17,508 islands which make up of the archipelagic Republic of Indonesia. □ It is easily one of Indonesia's most popular tourist destinations known throughout the world as a paradise isle set in the southern seas with its story-book setting of sun-drenched beaches, rolling surf, fertile plains and sculptured rice terraces. □ Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia. □



### Local Transportation □

Although many visitors to Bali like to rely on tour companies, there is really nothing like setting off to explore on your own. □ Arm yourself with a map and trusty guide book and head off in a hotel taxi, a hire car with or without a driver, or motor bike. □ Gather a group of friends or family and hire a microbus. □ Bali is at your fingertips. □

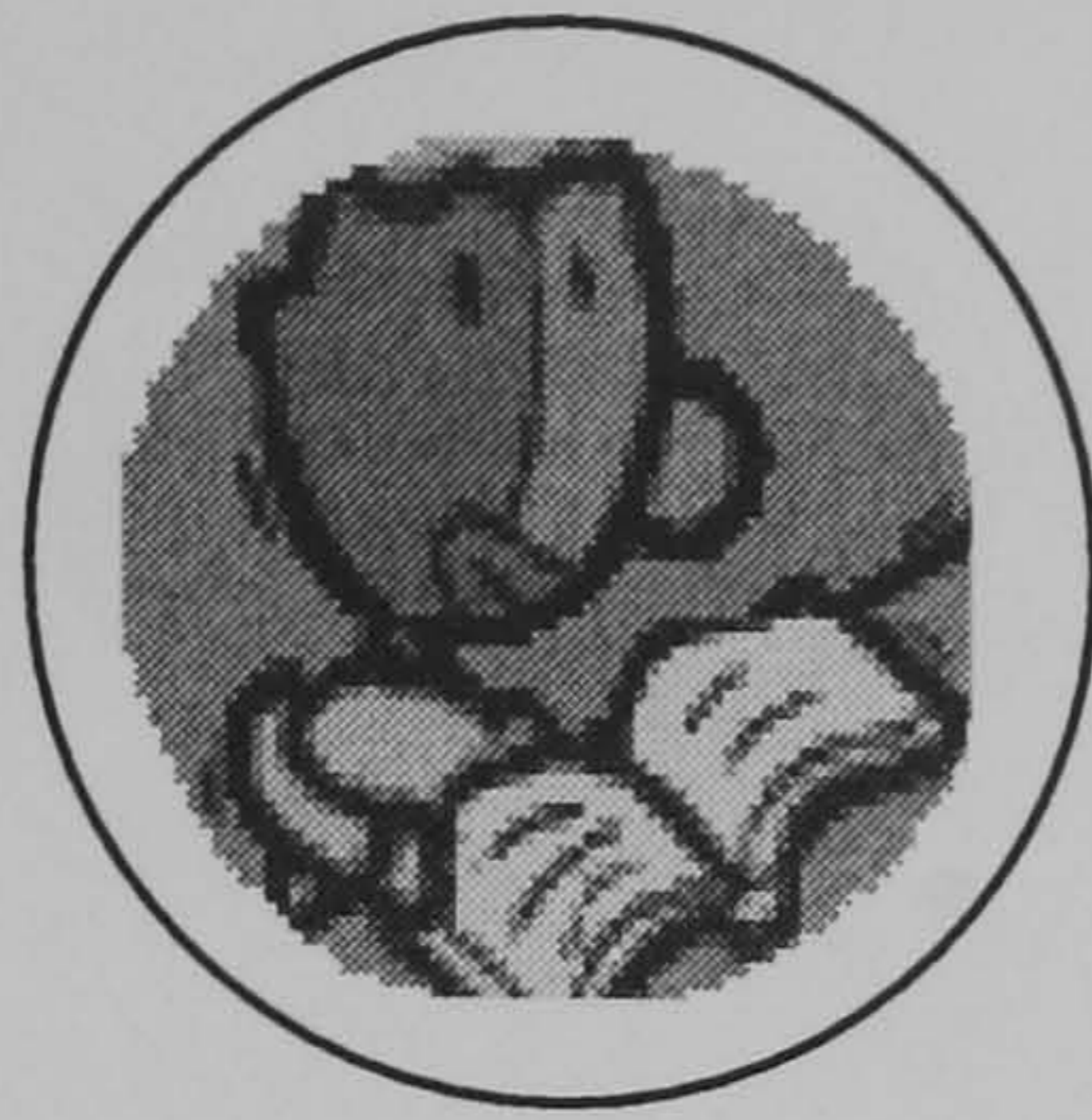
Those looking for adventure can try the local "*bemos*". □ You never know who will end up sharing the car with, but it could be ducks, chickens, women off to the market to sell their produce or a group of boys going to perform at a dance. □ *Bemos* are fun, frequent and above all, very cheap. □ For a change of pace, negotiate a "*dokar*" the local horse and carriage that can carry three or four passengers. □ In Denpasar and Singaraja the carts ply up and down the streets taking passengers to market and around town. □ Their harness bells jingle as they make their colourful way through the streets. □ The tiny horses seem to be amazingly strong for their size. □

One of the most popular (and most dangerous) ways to get about in Bali is to take a motor bike. □ Cheap and practical, they can be great fun. □ But be warned. □ Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about. □ Bikes can be rented in Kuta, Denpasar and Sanur for very reasonable prices by the day or the week. □ Drivers need a valid International Driver's License and helmets are compulsory. □ Perhaps the best way to get about is by bicycle. □ The friendly Balinese love to stop for a chat, and a bicycle is just the right speed. □

(Adapted from: <http://asiatravel.com/baliinfo.html#top>)



### D.3 Translated Think-Aloud Instructions



#### ข้อปฏิบัติ

1. ให้นักศึกษาสมมุติสถานการณ์ว่า ขณะนี้นักศึกษากำลังนั่งอยู่คนเดียวในห้องนี้ และมีจำเป็นต้องอ่านบทอ่านที่ได้รับมอบหมาย โดยมีจุดประสงค์หลักในการอ่าน คือ ให้นักศึกษาพยายามทำความเข้าใจบทอ่านดังกล่าวให้มากที่สุด นักศึกษาสามารถใช้ความรู้ความสามารถ และกลวิธีการอ่านใดๆมาช่วยในการอ่านก็ได้
2. ให้นักศึกษาอ่านบทอ่านดังกล่าวในใจ และให้หยุดอ่านทุกครั้งเมื่อมาถึงสัญลักษณ์สี่เหลี่ยม (□)
3. ที่สัญลักษณ์สี่เหลี่ยม (□) ดังกล่าว ให้นักศึกษาคิดเสียงดัง (Think-aloud) ถึงเนื้อความที่นักศึกษาอ่านมาแล้วว่า นักศึกษเข้าใจบทอ่านที่อ่านมาแล้วหรือไม่ เพียงไร หากเข้าใจนักศึกษามีวิธีการทำความเข้าใจบทอ่านนั้นๆอย่างไร และหากถ้านักศึกษาไม่เข้าใจ นักศึกษามีวิธีแก้ปัญหาดังกล่าวอย่างไร เมื่อนักศึกษาคิดเสียงดังในส่วนดังกล่าวจบแล้ว ให้นักศึกษากลับไปอ่านต่อเช่นเดิม
4. ให้นักศึกษาทำเช่นนี้ไปเรื่อยๆ จนกระทั่งนักศึกษาอ่านจบบทอ่านที่ให้มา ระหว่างอ่านและขณะคิดเสียงดัง (Think-aloud) นักศึกษาจะไม่ถูกถามนำ หรือตั้งคำถามใดๆทั้งสิ้น
5. อย่าลืมนักศึกษาคิดว่ากำลังนั่งอยู่คนเดียว และกำลังพูดอยู่กับตัวเอง ถึงวิธีการที่นักศึกษพยายามทำความเข้าใจกับบทอ่านดังกล่าว การคิดเสียงดังไม่ได้พูดเพื่ออธิบายให้ใครฟัง
6. นักศึกษาจะถูกบันทึกเทปขณะ นักศึกษาคิดเสียงดัง (Think-aloud)



**D.4 Text for a Think-Aloud Practice****Irish Rose** □

Third Party material excluded from digitised copy.  
Please refer to original text to see this material.

**Source:** Brennan, F. (2004). *Tales of the Supernatural*. Cambridge: Cambridge University Press.



**APPENDIX E: Reading Log Form**





## READING LOG

Name: \_\_\_\_\_ Section: \_\_\_\_\_ Student's No: \_\_\_\_\_

Starting Time: \_\_\_\_\_ Finishing Time: \_\_\_\_\_ Source: \_\_\_\_\_

How did you read?	What problems did you have while reading?	What did you do to solve the problems?	Did it work?



**APPENDIX F:      Reading Comprehension Test and Other  
Related Materials**



Third Party material excluded from digitised copy.  
Please refer to original text to see this material.



**APPENDIX G: Statistics on the Reading Comprehension Test**



## G.1 Test Summary

### Test statistics

	Mean	Min	Median*	Max	Std Devn	Var
<b>Test scores</b>	17.207	10.000	17.5000	25.000	3.842	14.763
<b>Diff. index</b>	0.574	0.086	0.483	0.879	0.515	0.265
<b>Delta</b>	12.135	8.274	13.386	18.498	2.581	6.664
<b>Disc. index</b>	0.320	0.000	0.267	0.533	0.175	0.031
<b>Biserial RBIS</b>	0.373	0.070	0.384	0.699	0.181	0.033
<b>Point-biserial RPB</b>	0.283	0.056	0.272	0.488	0.137	0.019

### Kuder-Richardson Reliability Statistics

KR20 = 0.617      SEM20 = 2.376

KR21 = 0.520      SEM21 = 2.661

### Cronbach Alpha Reliability Statistics

ALPHA = 0.617      SEM-ALP = 2.376

### Spilt-half Reliability Statistics

RTT = 0.604      SEMTT = 2.419

\*Appropriate medians if the distributions are not normal.

## G.2 Piloted Test Score Statistics

No. of items	30
Respondents	58
Mean score	17.21
Standard Deviation	3.84
Mean standard error	0.509
Maximum	25
Minimum	10
Range	15.00
QD	3.00
Median	17.50
Mode*	18
SK	0.00
KU	2.26

\**Estimated mode*

If the score distribution is not normal, look for the actual mode. (The score with highest frequency)



### G.3 Distribution of Scores

Scores	Scores		Cumulative frequency	Per cent frequency	Cumulative Per cent frequency	Percentile rank
	Raw	Percent				
25	83.3	2.0	2.0	3.4	3.4	98.3
24	80.0	1.0	3.0	1.7	5.2	95.7
23	76.7	2.0	5.0	3.4	8.6	93.1
22	73.3	1.0	6.0	1.7	10.3	90.5
21	70.0	7.0	13.0	12.1	22.4	83.6
20	66.7	5.0	18.0	8.6	31.0	73.3
19	63.3	4.0	22.0	6.9	37.9	65.5
18	60.0	7.0	29.0	12.1	50.0	56.0
17	56.7	4.0	33.0	6.9	56.9	46.6
16	53.3	6.0	39.0	10.3	67.2	37.9
15	50.0	2.0	41.0	3.4	70.7	31.0
14	46.7	7.0	48.0	12.1	82.8	23.3
13	43.3	2.0	50.0	3.4	86.2	15.5
12	40.0	3.0	53.0	5.2	91.4	11.2
11	36.7	3.0	56.0	5.2	96.6	6.0
10	33.3	2.0	58.0	3.4	100.0	1.7

### G.4 Item Analysis

Item No.	Difficulty index (Total)	Delta	Discrimination index
1	0.879	8.270	0.200
2	0.638	11.550	0.533
3	0.241	15.850	0.400
4	0.414	13.910	0.067
5	0.310	15.020	0.467
6	0.534	12.610	0.533
7	0.828	9.180	0.000
8	0.467	13.390	0.333
9	0.862	8.600	0.333
10	0.741	10.370	0.200
11	0.845	8.900	0.067
12	0.379	14.270	0.533
13	0.483	13.210	0.133
14	0.845	8.900	0.200
15	0.776	9.930	0.400
16	0.483	13.210	0.600
17	0.655	11.360	0.400
18	0.828	9.180	0.467



19	0.586	12.090	0.667
20	0.845	8.900	0.400
21	0.293	15.220	0.133
22	0.397	14.090	0.200
23	0.569	12.270	0.333
24	0.086	18.500	0.133
25	0.293	15.220	0.267
26	0.534	12.610	0.133
27	0.517	12.790	0.400
28	0.466	13.390	0.533
29	0.828	9.180	0.267
30	0.586	12.090	0.267
<b>Sum</b>	<b>17.208</b>	<b>364.060</b>	<b>9.599</b>
<b>Total</b>	<b>0.574</b>	<b>12.135</b>	<b>0.320</b>



**APPENDIX H: Materials Related to Reading Strategy Training**



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Please refer to original text to see this material.



**APPENDIX I: Think-Aloud Transcriptions**



## I.1 Think-Aloud Transcriptions Based on Text 1

Sentence No. & Text	Protocols	Reading Strategies
S1 Did you know we live in a GREENHOUSE?	<ul style="list-style-type: none"> <li>- I think we really do.</li> <li>- These days... What's that again? I think I have read about it in the newspaper somewhere.</li> </ul>	<p>M4.8 Talk to the text</p> <p>C8.2 Activate previous knowledge</p>
S2 Earth in a Greenhouse?	<ul style="list-style-type: none"> <li>- It's a question.</li> <li>- Does it mean the Earth is in a greenhouse?</li> <li>- Not too sure about that.</li> </ul>	<p>M3.2 Pay attention to the use of punctuation marks</p> <p>M4.3 Asking for information about the text</p> <p>M4.1 Recognize reading problems one is having</p>
S3 You probably know that flowers, fruit and vegetables can be grown in a greenhouse, but did you know that we humans also live in a greenhouse?	<ul style="list-style-type: none"> <li>- "Greenhouse" and the 'greenhouse effect'. Are these two actually referring to the same thing?</li> <li>- Maybe not. A "greenhouse" could also be referred to a place where plants are grown.</li> </ul>	<p>M4.3 Asking for information about the text</p> <p>C8.1 Activate known vocabulary</p>
S4 Of course we are not surrounded by glass.	<ul style="list-style-type: none"> <li>- That's for sure. We aren't surrounded by glass.</li> </ul>	<p>M4.8 Talk to the text</p>
S5 We are surrounded by a blanket of air called the atmosphere which has kept the temperature on Earth just right for centuries.	<ul style="list-style-type: none"> <li>- But how do we actually live in the greenhouse?</li> <li>- I see. They're only drawing an analogy. An analogy between an atmosphere and a blanket of air. We live under the blanket in the sense that it is actually referring to the atmosphere.</li> </ul>	<p>M4.3 Asking for information about the text</p> <p>M4.4 Verify one's understanding of the text</p>
S6 Just as the glass in a greenhouse holds the sun's warmth inside, so the atmosphere traps the sun's heat near the Earth's surface and keeps the Earth warm.	<ul style="list-style-type: none"> <li>- Or does it have anything to do with ozone? Ah... maybe the text has something to say about ozone.</li> </ul>	<p>C10.3 Make a prediction</p>



<p>S7 We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things.</p> <p>S8 The average temperature of the Earth's surface with the greenhouse effect is 15 degrees Celsius.</p> <p>S9 Without the natural greenhouse effect, the temperature would be - 18 degrees Celsius.</p>	<p>- The atmosphere has been accumulating the sun's heat, and finally it has got holes in it resulting in the greenhouse effect. The plants' greenhouse is a literal greenhouse, while the humans' greenhouse refers to the greenhouse effect. That's how it should go, more or less.</p> <p>- Aha! It really does discuss about the greenhouse effect.</p> <p>- Huh? But why does the text say, "We call this the natural greenhouse effect because it makes the Earth a perfect planet for growing and living things."? The greenhouse effect is always having a negative effect, isn't it? Huh! Or is it just my misunderstanding?</p> <p>- "Cel::sius::". "Fifteen degrees Celsius".</p> <p>- "Eighteen".</p> <p>- Ah, huh. The "greenhouse effect" is a kind of phenomena. It's ... What do you call this? It actually helps to make the Earth warm. It's a phenomenon which has a positive effect towards the Earth. It helps the Earth not to get too heated. It may go like this. Without ... With the "greenhouse effect" the temperature near the Earth surface would be around 15°C. Isn't that right? But without the greenhouse effect, the temperature would increase by 3 °C which would make it up to 18 °C.</p>	<p>C8.2 Activate previous knowledge</p> <p>M4.5 Check one's understanding of the text</p> <p>M4.3 Asking for information about the text</p> <p>M3.1 Pay attention to key words</p> <p>M3.1 Pay attention to key words</p> <p>M4.4 Verify one's understanding of the text</p>
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	<ul style="list-style-type: none"> <li>- *It's actually -18 °C.*</li> <li>- Minus 18 °C. Umm! Minus 18 °C. Minus 18 °C.</li> </ul>	
<p>S10 The Greenhouse Effect and Global Warming</p>	<ul style="list-style-type: none"> <li>- Uh-huh. Actually I was right before then. The greenhouse effect helps to heat up the Earth. But without it...</li> <li>- Huh! Just forget about it for the time being!</li> </ul>	<p>M4.6 Correct one's understanding of the text</p> <p>M3.3 Skip to the next sentence</p>
<p>S11 For hundreds of years the Earth's atmosphere has changed very little.</p>	<ul style="list-style-type: none"> <li>- Umm, over here. I think the text is going to discuss about the greenhouse effect in that it makes the Earth become ... discuss the global warming and how the Earth is getting heated. Will it be so? Let me find out now.</li> </ul>	<p>M1.1 Guess from title or sub-title</p>
<p>S12 It has kept the right temperature for plants and animals, including humans, to survive quite comfortably.</p>	<ul style="list-style-type: none"> <li>- Talking about the change. Is the text going to discuss about the change in the temperature?</li> </ul>	<p>C10.3 Make a prediction</p>
	<ul style="list-style-type: none"> <li>- Ah! With the right temperature, plants and animals can survive. If not, some animals might die because of diseases. The best thing to cure for this is the atmosphere.</li> </ul>	<p>M4.4 Verify one's understanding of the text</p>
<p>S13 Many scientists now believe that the addition of greenhouse gases from human or manmade sources is throwing our atmosphere and the natural greenhouse effect out of balance.</p>	<ul style="list-style-type: none"> <li>- That keeps me thinking if it could be true that under the influence of the greenhouse effect, the temperature would be changed from 'right' to 'wrong'?</li> <li>- See? That's true.</li> <li>- That means under the "greenhouse effect", the 'right' temperature could turn 'wrong' as it would create a leakage in the atmosphere resulting in global imbalance.</li> </ul>	<p>C10.3 Make a prediction</p> <p>M4.5 Check one's understanding of the text</p> <p>M4.4 Verify one's understanding of the text</p>



<p>S14 It would appear that the atmosphere is trapping too much heat and causing the Earth to heat up.</p>	<p>- Ah, so the [greenhouse] effect has heated up the Earth.</p>	<p>M4.4 Verify one's understanding of the text</p>
<p>S15 This is known as GLOBAL WARMING.</p>	<p>- Ah, so they want to define the term. Whatever has caused "the Earth to heat up" is called "global warming".</p>	<p>M4.4 Verify one's understanding of the text</p>
<p>S16 Did you know?</p>	<p>- Is it a scientific term?</p> <p>- Knowing about what? Let me read first.</p>	<p>M4.3 Asking for information about the text</p> <p>M4.8 Talk to the text</p>
<p>S17 Some of our energy sources, known as fossil fuels, have been trapped beneath the ground for millions of years:</p> <ul style="list-style-type: none"> <li>• coal</li> <li>• oil</li> <li>• natural gas.</li> </ul>	<p>- Does "coal" mean 'taan hin' [a word for 'coal' in Thai]? Yes, I think so. Oil, natural gas.</p> <p>- Is the text going to suggest some other sorts of fossil fuels apart from these or is it going to be about the 'greenhouse effect'? Let me read now.</p> <p>- No. None of those.</p>	<p>C8.1 Activate known vocabulary</p> <p>C10.3 Make a prediction</p> <p>M4.5 Check one's understanding of the text</p>
<p>S18 They release energy when they are burned</p>	<p>- The text simply has something to say about the gases. The gases mentioned under "Did you know?" So did you know when these gases ... when these energy sources are burned, they...</p> <p>- My guess is that the text is going to talk about how these gases have an effect on the atmosphere as well as the greenhouse effect? Is that so?</p>	<p>M4.7 Integrate information with previous sentence</p> <p>C10.3 Make a prediction</p>
<p>S19 They also release large quantities of greenhouse gases.</p>	<p>- Aha! That's right. They emit greenhouse gases. That's close.</p>	<p>M4.5 Check one's understanding of the text</p>



<p>S20 Plants and trees are natural regulators of the atmosphere.</p>	<ul style="list-style-type: none"> <li>- “Regulator.” What does it mean? “Regulator.”</li> <li>- “Regulator.” [while looking the word up in the dictionary]</li> <li>- There’s no “regulator” in here. ‘To regulate’ means ‘to control’, so “regulator” should mean something like ‘controller’.</li> <li>- Huh? But how can plants and trees do that?</li> <li>- Ah! Maybe they do so by releasing oxygen. Will it go something like this?</li> <li>- In order to prevent the carbon dioxide from entering into the atmosphere, these plants and trees try to hold back the carbon dioxide, while releasing the oxygen. Is that so? Will it go like that?</li> </ul>	<p>M4.2 Identify the source of reading problems</p> <p>C1.1 Look up in dictionary</p> <p>C1.2 Fit meaning into context</p> <p>M4.3 Asking for information about the text</p> <p>C10.3 Make a prediction</p> <p>C8.2 Activate previous knowledge</p>
<p>S21 They help keep things in balance.</p>	<ul style="list-style-type: none"> <li>- “Keep things in balance”? But how?</li> <li>- By controlling the amount of carbon dioxide?</li> </ul>	<p>M4.3 Asking for information about the text</p> <p>C10.3 Make a prediction</p>
<p>S22 Destroying our forests, or <b>deforestation</b>, upsets this balance and actually results in increasing amounts of carbon dioxide in the atmosphere.</p>	<ul style="list-style-type: none"> <li>- See? That’s right.</li> <li>- It has something to do with carbon dioxide. This carbon dioxide causes a leakage in the atmosphere resulting in the greenhouse effect.</li> <li>- Destroying the forests or “deforestation”... I know the word “forest” which refers to ‘pah’ [a word for ‘forest’ in Thai].</li> <li>- Therefore, “deforestation” should mean something like ‘the destruction of the forests’. Is that so? It should carry a similar</li> </ul>	<p>M4.5 Check one’s understanding of the text</p> <p>C8.2 Activate previous knowledge</p> <p>C8.1 Activate known vocabulary</p> <p>C10.1 Guess unknown words</p>



<p>S23 What's wrong with Global Warming?</p>	<p>meaning as "destroying our forests".</p> <p>- What could be some of the "What's wrong's"? Perhaps more people might develop skin cancer and trees might not be growing properly. Possibly?</p>	<p>M1.1 Guess from title or sub-title</p>
<p>S24 The fact of the matter is that global warming could easily mean changes to our daily lives.</p>	<p>- Ah. In what way our daily lives could be changed?</p> <p>- Let me think. My guess would be about how we used less air-conditioner in the past, but we use it more now as it's getting hotter.</p> <p>- If the air-conditioning machines produce CFC, we will have more of it spread in the atmosphere. That will increase the greenhouse effect, and the Earth will become hotter. Will it go like this?</p>	<p>M4.3 Asking for information about the text</p> <p>C10.3 Make a prediction</p> <p>C8.2 Activate previous knowledge</p>
<p>S25 If the global warming trend continues, we may experience shorter, warmer winters, and longer hotter summers.</p>	<p>- Umm. Things will never be the same again. It will be less cold or warmer in winters and even hotter in summers.</p> <p>- We're actually experiencing that now. Bangkok is getting hotter and hotter every year. That should be one of the global warming trends.</p>	<p>M4.4 Verify one's understanding of the text</p> <p>C8.3 Relate to personal experience</p>
<p>S26 You Want to Help?</p>	<p>- Yes. And how could I be of help? The number of the world population is so large. What if I help, while others just don't bother? It is not gonna be very effective, is it? Let me read now. I'll see what I can do about it.</p>	<p>M4.8 Talk to the text</p>
<p>S27 So what can you do about global warming?</p>	<p>- Yeah. What can you do about it?</p>	<p>M4.8 Talk to the text</p>



<p>S28 First of all, think about what causes global warming.</p>	<p>- Yes, that's right. We need to find out first what some of the causes of "global warming" are. Once we know what the problems are about, we'll then be able to solve them.</p> <p>- "More efficiently". Ah. That means the same, more or less, as 'more effectively'.</p>	<p>M4.8 Talk to the text</p>
<p>S29 If burning fossil fuels adds greenhouse gases to the atmosphere, we should find ways to use these fuels more efficiently.</p>	<p>- "Efficiently." [while looking the word up in the dictionary]</p> <p>- That's right. Efficiently. But how to use them more efficiently?</p> <p>- Perhaps 'efficiently' also means 'moderately'. It probably implies not to overuse them. If you use more, you'll end up having more of the "greenhouse effect". Isn't that true?</p> <p>- I'm confused. We should plant a new tree for everyone that...</p>	<p>C8.1 Activate known vocabulary</p> <p>C1.1 Look up in dictionary</p> <p>M4.3 Asking for information about the text</p> <p>M4.4 Verify one's understanding of the text</p> <p>M4.1 Recognize reading problems one is having</p>
<p>S30 If cutting down forests and trees aids global warming, we should be sure to plant a new tree for every one that is cut down or burned.</p>	<p>- Ah. Does it simply mean no matter how many trees you burned or cut down, you need to grow them back? I think they just want you to grow the trees back.</p> <p>- But you need to grow them according to the number that ... I wonder who can actually keep an accurate track of the number of trees which were cut down or burned. It's just like the situation where you close the barn door after the horses have gone. How long ago were these trees cut down? In which century? It makes no sense. It's absolutely not practical.</p>	<p>M4.4 Verify one's understanding of the text</p> <p>M4.8 Talk to the text</p>



<p>S31 Decide how you can help.</p>	<p>- “Can help?” But I’m only a student. Anyway, I would rather agree with the one suggesting about “burning the fuels” more efficiently. The latter? I just simply can’t do it. Planting trees in the forests! It must be so hot out there.</p>	<p>M4.8 Talk to the text</p>
<p>S32 It may be as simple as sharing the information you learned in this paper with your neighbours and friends it's a start!!</p>	<p>- Um. Huh? What’s this? Sharing the information with your neighbours who you rarely talk to? Talking with friends is OK.</p>	<p>M4.8 Talk to the text</p>
<p>S33 Many people don't understand the greenhouse effect and global warming.</p>	<p>- But I think most of them should have already known about it.</p>	<p>M4.8 Talk to the text</p>
<p>S34 You can help them learn.</p>	<p>- But it’s the information they’re discussing over here that some [people] might not understand, and it’s our job to help them learn, right?</p> <p>- What should be done about it, then? How about having a website? Better not. I’m sort of being lazy. I’m not gonna do anything. I’d better let the government do it. Let the government do it. I’m just being lazy.</p>	<p>M4.4 Verify one’s understanding of the text</p> <p>M4.8 Talk to the text</p>
<p>S35 If you can't decide where to begin, here's TWO SIMPLE THINGS YOU CAN DO TO HELP STOP GLOBAL WARMING...</p>	<p>- “If you can’t decide...” About what?</p>	<p>M4.3 Asking for information about the text</p>
<p>S36 1. Turn off unnecessary lights.</p>	<p>- &lt;Turn off unnecessary lights.&gt;</p> <p>- Ah, yes. I can do this. I do it quite often actually.</p>	<p>C7.1 Vocalize</p> <p>M4.8 Talk to the text</p>



S37 2. Walk, ride your bike or take the bus more often.	- Riding a bike. I always take a bus in the campus. I sit on a pillion while my friend is riding. Ok. I do both. Talking about turning off the lights. Sometime, I don't turn them off when I go to the shower. The dormitory has to pay for the electricity bills, but that should have already been included in my rental fees.	M4.8 Talk to the text
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## I.2 Think-Aloud Transcriptions Based on Text 2

Sentence No. & Text	Protocols	Reading Strategies
S1 Bali Travel Information	<ul style="list-style-type: none"> <li>- Is the text going to be about tourism?</li> <li>- I can recognize it from here... here. The text's got website features, and it seems to be about tourism.</li> <li>- It reminds me of Bali.</li> </ul>	<p>M1.1 Guess from title or sub-title</p> <p>M1.2 Preview the text</p> <p>C8.3 Relate to personal experience</p>
S2 Introduction	<ul style="list-style-type: none"> <li>- I think the text is going to introduce some of the tourist attractions in Bali or perhaps give an overview of ... what Bali's like or what the history of Bali's like... something like that.</li> </ul>	<p>M1.1 Guess from title or sub-title</p>
S3 There is a legend told of an island east of Java.	<ul style="list-style-type: none"> <li>- "Island east of Java ... island east of Java" Um, it's an island of Java. It's an island to the ... Which of these does the text want to say exactly, 'an island is to the east of Java' or 'Bali is to the east of Java'?</li> <li>- I think it's more of, 'Bali is to the east of Java'. Yes. More of, 'Bali is to the east of Java'.</li> </ul>	<p>M4.3 Asking for information about the text</p> <p>M4.4 Verify one's understanding of the text</p>
S4 It was a beautiful island, but its fertile plains and shores rocked and were unsteady.	<ul style="list-style-type: none"> <li>- What is this? What does "fertile" mean?</li> <li>- A ship? Oh, no!</li> <li>- Umm... Just move on to the next sentence.</li> </ul>	<p>M4.2 Identify the source of reading problems</p> <p>C10.1 Guess unknown words</p> <p>M3.3 Skip to the next sentence</p>



<p>S5 The gods came to meet and discuss.</p>	<ul style="list-style-type: none"> <li>- &lt;The gods came to meet and discuss.&gt;</li> <li>- Does it mean the gods came to meet with the gods?</li> <li>- I think “came to meet and discuss” simply has the same meaning as ‘met’.</li> <li>- It is probably an expression.</li> <li>- But I’m not sure about that.</li> </ul>	<p>C7.1 Vocalize/sub-vocalize M4.3 Asking for information about the text C10.1 Guess unknown words</p> <p>C5.1 Apply known rules M4.1 Recognize reading problems one is having</p>
<p>S6 They decided the answer lay in placing a mountain upon the island, to balance, and calm it.</p>	<ul style="list-style-type: none"> <li>- Ah! More or less. I know now. You’ve to read it from here to know what it’s all about. Perhaps “the gods” mentioned earlier may have been created by the same gods here who placed a mountain on the island.</li> <li>- What is this all about?</li> <li>- It seems to me like the text is telling about a legend of the island, east of Java. It’s just about people’s belief.</li> </ul>	<p>M4.7 Integrate information with previous sentence</p> <p>M4.1 Recognize reading problems one is having</p> <p>M4.4 Verify one’s understanding of the text</p>
<p>S7 And so they did.</p>	<ul style="list-style-type: none"> <li>- Ah. And so what ‘the gods’ did was to recreate the island.</li> </ul>	<p>C10.5 Identify reference</p>
<p>S8 Happiness then came back on the island and all was at peace.</p>	<ul style="list-style-type: none"> <li>- (Happiness then was brought back to the island once again.)</li> </ul>	<p>C9.1 Translate into Thai</p>
<p>S9 The mountain was called Great Mountain - <b>GUNUNG AGUNG</b> - and the island is <b>BALI</b>, "<b>The Morning of the World</b>", a magical island full of legends and mystical tales set among the thousands of islands that are <b>INDONESIA</b>.</p>	<ul style="list-style-type: none"> <li>- What language is this? Is it Indonesian?</li> <li>- “... and the island is...” Ah, so “the island” is actually referring to Bali.</li> <li>- So, Bali is the “island east of Java” as previously mentioned.</li> <li>- “...morning of the world...” “...magical island...” Oh. Oh. It says here that Indonesia consists of thousand islands. But from what I remember in my schooldays, doesn’t it have more than 3,000 islands?</li> </ul>	<p>M4.3 Asking for information about the text C10.5 Identify reference</p> <p>M4.7 Integrate information with previous sentence C8.3 Relate to personal experience</p>



<p><b>S10 Geography</b></p> <p>(S11) Bali is one of the 17,508 islands which make up of the Republic of Indonesia.</p> <p>(S12) It is easily one of Indonesia's most popular tourist destinations known throughout the world as a paradise isle set in the southern seas.</p> <p>(S13) Located near the eastern-most tip of Java island across the narrow Straits of Bali, this 'Isle of the Gods' is peopled by the friendly Balinese who are more exposed to international tourists than many people in other parts of Indonesia.</p> <p><b>(S14) Local transportation</b></p> <p>(S15) Although many visitors to Bali like to rely on tour companies, there is really nothing like setting off to explore on your own.</p>	<p>- (But it says here, Bali is one of the thousand islands with lots of legends and mystical tales. It's one of those thousand islands of Indonesia.)</p> <p>- &lt;Geography...geography&gt;</p> <p>- Is it going to be about the climatic or geographical features?</p> <p>- Ah, that's correct.</p> <p>- Oh, more than 17,500 islands. That's quite a lot!</p> <p>- (Bali is an island well-known throughout the world. It's one of the most popular islands to visit.)</p> <p>- Oh! Very complicated. The sentence structure is so complex and complicated that it confuses me.</p> <p>- The text seems to discuss about the geography of Bali. That's all I can see.</p> <p>- Is it going to be about the local transportation?</p> <p>- &lt;Local transportation&gt;</p> <p>"...nothing like setting off to explore on your own." This is so confusing! "...setting off to explore on your own."</p> <p>- Just forget it!</p>	<p>C9.1 Translate into Thai</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>M1.1 Guess from title or sub-title</p> <p>M4.5 Check one's understanding of the text</p> <p>M4.8 Talk to the text</p> <p>C9.1 Translate into Thai</p> <p>M4.2 Identify the source of reading problems</p> <p>M4.4 Verify one's understanding of the text</p> <p>M1.1 Guess from title or sub-title</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>M4.1 Recognize reading problems one is having</p> <p>M3.3 Skip to the next sentence</p>
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<p>(S16) Arm yourself with a map and trusty guide book and head off in a hotel taxi, a hire car with or without a driver, or motor bike.</p>	<p>- &lt;Arm yourself with a map...in a hotel taxi, a hire car with or without a driver, or motor bike.&gt;  - (There's a taxi you can hire as well a motorbike in Bali. You can travel anywhere you want.)</p>	<p>C7.1 Vocalize/sub-vocalize  C9.1 Translate into Thai</p>
<p>(S17) Gather a group of friends or family and hire a microbus.</p>	<p>- &lt;Gather a group of friends or family and hire a microbus.&gt;  - (Oh, I see. You can also hire a microbus if you're traveling with your family.)</p>	<p>C7.1 Vocalize/sub-vocalize  C9.1 Translate into Thai</p>
<p>(S18) Bali is at your fingertips.</p>	<p>- &lt;Bali is at your fingertips.&gt;  - "Fingertip"? Does it mean something like ... Bali is at the end of your finger? That should be so.  - Isn't it an expression?</p>	<p>C7.1 Vocalize/sub-vocalize  C10.1 Guess unknown words</p>
<p>(S19) Those looking for adventure can try the local "bemos".</p>	<p>- &lt;Those looking for adventure can try the local bemos.&gt;  - Those who are looking for adventure ... for excitement... What are "bemos"? I don't know what they are.  - Perhaps the word "bemos" suggests a place where you can go traveling.</p>	<p>C5.1 Apply known rules  C7.1 Vocalize/sub-vocalize  M4.2 Identify the source of reading problems</p>
<p>(S20) You never know who will end up sharing the car with, but it could be ducks, chickens, women off to the market to sell their produce or a group of boys going to perform at a dance.</p>	<p>- "You never know who will end up sharing the car with,..." I think "end up" has a similar meaning as 'finish'. I came across this word in my grade 12. My teacher told me it has the same meaning as 'finish' or 'put an end'.  - &lt;...sharing the car with. You never know who will end up sharing the car with, but it could be ducks, chickens,...&gt;  - Ah, so the car you will be traveling in is also used for transporting sheep, chickens, etc., and what you have to do is to ask the driver if you can have a ride. Is this what the text wants to say?</p>	<p>C10.1 Guess unknown words  C8.1 Activate known vocabulary  C7.1 Vocalize/sub-vocalize  M4.4 Verify one's understanding of the text</p>



<p>(S21) Bemos are fun, frequent and above all, very cheap.</p> <p>(S22) For a change of pace, negotiate a “<i>dokar</i>” the local horse and carriage that can carry three or four passengers.</p> <p>(S23) In Denpasar and Singaraja the carts ply up and down the streets taking passengers to market and round town</p> <p>(S24) Their harness bells jingle as they make their colourful way through the streets.</p>	<ul style="list-style-type: none"> <li>- “...women off to the market to sell their produce or a group of boys...” Oh, no! “...a group of boys going to perform...” Oh! I don’t know anything now. I’m confused!</li> <li>- Do ‘ducks and chickens’ come with the “women off to the market to sell their produce”? Oh, no! Oh, no! These ‘ducks and chickens’ have nothing to do with the women.</li> <li>- &lt;Bemos are fun.&gt;</li> <li>- I think “bemos” and ‘hitchhiking’ are similar. Another thing, it’s also cheap. It should be referring to what is known as hitchhiking, but they just call it “bemos” in Bali.</li> <li>- I think it’s similar to the way we do hitchhiking when traveling here.</li> <li>- &lt;For a change of pace, negotiate a dokar the local horse and carriage that can carry three or four passengers.&gt;</li> <li>- “Negotiate?” What is it? What does it mean?</li> <li>- Oh, I see. I think it’s the way they use a horse as a mode of transportation. Is it also referring to as a carriage? Yes. It’s a carriage. “...the local horse and carriage...” Um, a carriage. It’s a carriage. A “dokar” is a carriage.</li> <li>- “In Denpasar, ... the carts ply up and down...” The text simply discusses about where this animal will take you to... somewhere like to market and around town.</li> <li>- &lt;Their harness bells jingle as they make their colourful way through the streets.&gt;</li> </ul>	<p>M4.1 Recognize reading problems one is having</p> <p>M4.6 Correct one’s understanding of the text</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>C10.1 Guess unknown words</p> <p>C8.3 Relate to personal experience</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>M4.2 Identify the source of reading problems</p> <p>M4.4 Verify one’s understanding of the text</p> <p>M4.4 Verify one’s understanding of the text</p> <p>C7.1 Vocalize/sub-vocalize</p>
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	<p>- Ah, so this kind of carriage is decorated with bells and many other items which make it “colourful”. That’s what the text wants to discuss. More or less? Yes. It should be like that. That is, this “dokar” is decorated with bells as well as other beautiful decorative items on the horseback ... on the carriage... more on the carriage itself.</p>	M4.4 Verify one’s understanding of the text
<p>(S25) The tiny horses seem to be amazingly strong for their size.</p>	<p>- &lt;The tiny horses seem to be amazingly strong for their size.&gt;</p> <p>- “Amazingly strong”. Umm. Does it simply mean ‘strong’? It’s strong in the sense that the horse can carry many people. It’s “amazingly strong” in that it’s unbelievably ‘str::ong for their size’.</p> <p>- “Amazingly strong for their size”? Oh, I don’t know what it means exactly.</p> <p>- From what I understand is that, although the horse is very small, it manages to carry 4 passengers? It shouldn’t be that ‘amazingly strong’ especially if you compare to its size which is relatively small. Um, it’s small, but can carry up to 4 people which is unbelievable. Is that what the text is trying to say?</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>C10.1 Guess unknown words</p> <p>M4.2 Identify the source of reading problems</p> <p>M4.4 Verify one’s understanding of the text</p>
<p>(S26) One of the most popular (and most dangerous) ways to get about in Bali is to take a motor bike.</p>	<p>- &lt;One of the most popular ways to get about in Bali is to take a motor bike.&gt;</p> <p>- Ah, another popular way, but in brackets it says that “most dangerous”.</p> <p>- A motor bike is the most dangerous. That’s really true. Even here in Bangkok ... it’s very dangerous.</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>M3.2 Pay attention to the use of punctuation marks</p> <p>C8.3 Relate to personal experience</p>
<p>(S27) Cheap and practical, they can be great fun.</p>	<p>- &lt;Cheap and practical, they can be great fun.&gt;</p>	<p>C7.1 Vocalize/sub-vocalize</p>



<p>(S28) But be warned.</p>	<p>- (Cheap and ... it's cheap, but it's also fun.)</p> <p>- &lt;But be warned.&gt;</p> <p>- But you must "be warned" which is some kind of warning.</p> <p>- Ah, what kind of warning could it be about? Perhaps about how the bike might easily cause accidents.</p> <p>- Just continue reading to find out I suppose.</p>	<p>C9.1 Translate into Thai</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>C8.1 Activate known vocabulary</p> <p>C10.3 Make a prediction</p> <p>M4.10 Continue reading</p>
<p>(S29) Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about.</p>	<p>- &lt;Many westerners are not prepared for the seeming chaos of Balinese roads and drivers have to watch for everything while zooming about.&gt;</p> <p>- Huh! What is this all about? The westerners ... the westerners have to be prepared for "the seeming chaos of Balinese roads and ... have to watch for everything while zooming about". I'm confused. I don't understand this. I don't know what it's all about.</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>M4.1 Recognize reading problems one is having</p>
<p>(S30) Bikes can be rented in Kuta, Denpasar and Sanur for very reasonable prices by the day or the week.</p>	<p>- &lt;Bikes can be rented in Kuta, Denpasar and Sanur for very reasonable prices by the day or the week.&gt;</p> <p>- (Uh, huh. You can rent bikes daily or weekly. The bikes can be rented by the day or the week.)</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>C9.1 Translate into Thai</p>
<p>(S31) Drivers need a valid International Driver's License and helmets are compulsory.</p>	<p>- &lt;Drivers need a valid International driver's License and helmets are compulsory.&gt;</p> <p>- (Uh, huh. A driver needs to have a license and a helmet.)</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>C9.1 Translate into Thai</p>
<p>(S32) Perhaps the best way to get about is by bicycle.</p>	<p>- &lt;Perhaps the best way to get about is by bicycle.&gt;</p> <p>- (Perhaps the best way is to ride a bike.)</p>	<p>C7.1 Vocalize/sub-vocalize</p> <p>C9.1 Translate into Thai</p>



<p>(S33) The friendly Balinese love to stop for a chat, and a bicycle is just the right speed.</p>	<p>- I suppose it should be so.</p> <p>- &lt;The friendly Balinese love to stop for a chat, and a bicycle is just the right speed.&gt;</p> <p>- Ah. The Balinese are somehow very “friendly”. They’re always greeting one another whenever they meet.</p>	<p>M4.8 Talk to the text</p> <p>C7.1 Vocalize/sub-vocalize</p> <p>C10.2 Infer overall meaning from context</p>
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**APPENDIX J: Data on Think-Aloud Verbal Reports**



**J.1 Overall Types and Frequencies of Think-Aloud Data**

	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>I. Metacognitive strategies</b>										
M1 Advance Organization										
M1.1 Guess from title or sub-title	4	6	4	3	5	2	4	2	30	2.71
M1.2 Preview the text	6	1	0	2	2	0	1	1	13	1.18
<b>Total of M1:</b>	10	7	4	5	7	2	5	3	43	3.89
M3 Selective Attention										
M3.1 Pay attention to key words	0	2	0	3	12	1	0	1	19	1.72
M3.2 Pay attention to the use of punctuation marks	4	2	0	2	10	1	2	3	24	2.17
M3.3 Skip to the next sentence	6	3	2	2	0	4	1	3	21	1.90
<b>Total of M3:</b>	10	7	2	7	22	6	3	7	64	5.79
M4 Self-monitoring										
M4.1 Recognize reading problems one is having	5	7	5	6	1	4	0	2	30	2.71
M4.2 Identify the source of reading problems	10	6	14	12	10	8	20	5	85	7.69
M4.3 Asking for information about the text	0	13	1	3	0	15	5	0	37	3.35
M4.4 Verify one's understanding of the text	0	18	3	0	6	7	2	2	38	3.44
M4.5 Check one's understanding of the text	0	6	0	0	0	0	0	0	6	0.54
M4.6 Correct one's understanding of the text	0	2	0	0	0	0	0	3	5	0.45
M4.7 Integrate information with previous sentence	2	3	0	1	16	1	4	1	28	2.53
M4.8 Talk to the text	0	15	0	0	0	12	0	0	27	2.44
M4.9 Read ahead	1	0	1	0	0	0	0	2	4	0.36
M4.10 Continue reading	0	1	0	0	0	3	0	1	5	0.45
M4.11 Reread	0	0	0	0	0	5	0	0	5	0.45
<b>Total of M4:</b>	18	71	24	22	33	55	34	13	270	24.43
<b>Total of Metacognitive strategies:</b>	38	85	30	34	62	63	42	23	377	34.12



II. Cognitive strategies	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
C1 Resourcing										
C1.1 Look up in dictionary	0	2	21	0	0	0	14	0	37	3.35
C1.2 Fit meaning into context	0	1	5	0	0	0	4	0	10	0.90
<b>Total of C1:</b>	0	3	26	0	0	0	18	0	47	4.25
C2 Grouping										
C2.1 Make use of grouping	1	0	0	0	2	0	0	0	3	0.27
<b>Total of C2:</b>	1	0	0	0	2	0	0	0	3	0.27
C4 Summarizing										
C4.1 Summarize the content read	1	0	0	2	0	0	0	2	5	0.45
<b>Total of C4:</b>	1	0	0	2	0	0	0	2	5	0.45
C5 Deduction										
C5.1 Apply known rules	4	2	3	0	7	1	3	2	22	1.99
<b>Total of C5:</b>	4	2	3	0	7	1	3	2	22	1.99
C6 Imagination										
C6.1 Visualize information	0	0	0	0	1	0	0	0	1	0.09
<b>Total of C6:</b>	0	0	0	0	1	0	0	0	1	0.09
C7 Auditory representation										
C7.1 Vocalize	26	21	1	33	3	16	0	40	140	12.67
<b>Total of C7:</b>	26	21	1	33	3	16	0	40	140	12.67
C8 Elaboration										
C8.1 Activate known vocabulary	3	6	4	7	38	5	2	2	67	6.06
C8.2 Activate previous knowledge	0	5	0	5	2	2	1	0	15	1.36
C8.3 Relate to personal experience	0	5	0	2	2	1	0	0	10	0.90
<b>Total of C8:</b>	3	16	4	14	42	8	3	2	92	8.33



	<b>Experimental Group</b>				<b>Control Group</b>					
<b>II. Cognitive strategies</b>	P1	P2	P3	P4	P5	P6	P7	P8	Total	%
C9 Transfer										
C9.1 Translate into Thai	55	9	53	51	33	25	44	60	330	29.86
<b>Total of C9:</b>	55	9	53	51	33	25	44	60	330	29.86
C10 Inferencing										
C10.1 Guess unknown words	4	7	11	9	8	6	7	8	60	5.43
C10.2 Infer overall meaning from context	0	1	0	0	3	0	0	0	4	0.36
C10.3 Make a prediction	0	9	0	0	0	1	0	0	10	0.90
C10.4 Make use of illustrations while reading	0	0	0	0	1	0	0	0	1	0.09
C10.5 Identify reference	5	2	2	0	1	2	1	0	13	1.18
<b>Total of C10:</b>	9	19	13	9	13	9	8	8	88	7.96
<b>Total of Cognitive strategies:</b>	99	70	100	109	101	59	76	114	728	65.88
<b>Total of the 2 main categories:</b>	137	155	130	143	163	122	118	137	1105	100.00



**J.2 Overall Types and Frequencies of Think-Aloud Data Based on Text 1**

	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>I. Metacognitive strategies</b>										
M1 Advance Organization										
M1.1 Guess from title or sub-title	1	2	1	2	1	1	1	1	10	1.90
M1.2 Preview the text	3	0	0	1	2	0	0	1	7	1.33
<b>Total of M1:</b>	4	2	1	3	3	1	1	2	17	3.24
M3 Selective Attention										
M3.1 Pay attention to key words	0	2	0	3	9	1	0	1	16	3.05
M3.2 Pay attention to the use of punctuation marks	3	1	0	0	8	0	2	1	15	2.86
M3.3 Skip to the next sentence	2	1	1	1	0	0	1	0	6	1.14
<b>Total of M3:</b>	5	4	1	4	17	1	3	2	37	7.05
M4 Self-monitoring										
M4.1 Recognize reading problems one is having	2	2	3	3	0	1	0	0	11	2.10
M4.2 Identify the source of reading problems	4	1	3	8	3	0	10	2	31	5.90
M4.3 Asking for information about the text	0	10	1	3	0	11	5	0	30	5.71
M4.4 Verify one's understanding of the text	0	10	0	0	0	0	0	0	10	1.90
M4.5 Check one's understanding of the text	0	5	0	0	0	0	0	0	5	0.95
M4.6 Correct one's understanding of the text	0	1	0	0	0	0	3	0	4	0.76
M4.7 Integrate information with previous sentence	1	1	0	0	4	0	4	0	10	1.90
M4.8 Talk to the text	0	13	0	0	0	11	0	0	24	4.57
M4.9 Read ahead	1	0	0	0	0	0	0	2	3	0.57
M4.10 Continue reading	0	0	0	0	0	0	0	0	0	0
M4.11 Reread	0	0	0	0	0	0	0	0	0	0
<b>Total of M4:</b>	8	43	7	14	7	23	22	4	128	24.38
<b>Total of Metacognitive strategies:</b>	17	49	9	21	27	25	26	8	182	34.67



II. Cognitive strategies	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
C1 Resourcing										
C1.1 Look up in dictionary	0	2	2	0	0	0	4	0	8	1.52
C1.2 Fit meaning into context	0	1	2	0	0	0	0	0	3	0.57
<b>Total of C1:</b>	0	3	4	0	0	0	4	0	11	2.10
C2 Grouping										
C2.1 Make use of grouping	1	0	0	0	1	0	0	0	2	0.38
<b>Total of C2:</b>	1	0	0	0	1	0	0	0	2	0.38
C4 Summarizing										
C4.1 Summarize the content read	1	0	0	1	0	0	0	0	2	0.38
<b>Total of C4:</b>	1	0	0	1	0	0	0	0	2	0.38
C5 Deduction										
C5.1 Apply known rules	1	0	0	0	1	0	1	0	3	0.57
<b>Total of C5:</b>	1	0	0	0	1	0	1	0	3	0.57
C6 Imagination										
C6.1 Visualize information	0	0	0	0	1	0	0	0	1	0.09
<b>Total of C6:</b>	0	0	0	0	1	0	0	0	1	0.09
C7 Auditory representation										
C7.1 Vocalize	20	1	1	15	3	12	0	12	64	12.19
<b>Total of C7:</b>	20	1	1	15	3	12	0	12	64	12.19
C8 Elaboration										
C8.1 Activate known vocabulary	0	4	1	4	23	0	2	1	35	6.67
C8.2 Activate previous knowledge	0	5	0	3	0	2	1	0	11	2.10
C8.3 Relate to personal experience	0	1	0	0	0	0	0	0	1	0.19
<b>Total of C8:</b>	0	10	1	7	23	2	3	1	47	8.95



	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>II. Cognitive strategies</b>										
C9 Transfer										
C9.1 Translate into Thai	29	0	34	27	26	7	21	34	178	33.90
<b>Total of C9:</b>	29	0	34	27	26	7	21	34	178	33.90
C10 Inferencing										
C10.1 Guess unknown words	2	1	2	5	4	0	2	3	19	3.62
C10.2 Infer overall meaning from context	0	0	0	0	3	0	0	0	3	0.57
C10.3 Make a prediction	0	8	0	0	0	1	0	0	9	1.71
C10.4 Make use of illustrations while reading	0	0	0	0	1	0	0	0	1	0.19
C10.5 Identify reference	1	0	0	0	0	1	1	0	3	0.57
<b>Total of C10:</b>	3	9	2	5	8	2	3	3	35	6.67
<b>Total of Cognitive strategies:</b>	55	23	42	55	63	23	32	50	343	65.33
<b>Total of the 2 main categories:</b>	72	72	51	76	90	48	58	58	525	100.00



### J.3 Overall Types and Frequencies of Think-Aloud Data Based on Text 2

	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>I. Metacognitive strategies</b>										
M1 Advance Organization										
M1.1 Guess from title or sub-title	3	4	3	1	4	1	3	1	20	3.45
M1.2 Preview the text	3	1	0	1	0	0	1	0	6	1.03
<b>Total of M1:</b>	6	5	3	2	4	1	4	1	26	4.48
M3 Selective Attention										
M3.1 Pay attention to key words	0	0	0	0	3	0	0	0	3	0.52
M3.2 Pay attention to the use of punctuation marks	1	1	0	2	2	1	0	2	9	1.55
M3.3 Skip to the next sentence	4	2	1	1	0	4	0	3	15	2.59
<b>Total of M3:</b>	5	3	1	3	5	5	0	5	27	4.66
M4 Self-monitoring										
M4.1 Recognize reading problems one is having	3	5	2	3	1	3	0	2	19	3.28
M4.2 Identify the source of reading problems	6	5	11	4	7	8	10	3	54	9.31
M4.3 Asking for information about the text	0	3	0	0	0	4	0	0	7	1.21
M4.4 Verify one's understanding of the text	0	8	3	0	6	7	2	2	28	4.83
M4.5 Check one's understanding of the text	0	1	0	0	0	0	0	0	1	0.17
M4.6 Correct one's understanding of the text	0	1	0	0	0	0	0	0	1	0.17
M4.7 Integrate information with previous sentence	1	2	0	1	12	1	0	1	18	3.10
M4.8 Talk to the text	0	2	0	0	0	1	0	0	3	0.52
M4.9 Read ahead	0	0	1	0	0	0	0	0	1	0.17
M4.10 Continue reading	0	1	0	0	0	3	0	1	5	0.86
M4.11 Reread	0	0	0	0	0	5	0	0	5	0.86
<b>Total of M4:</b>	10	28	17	8	26	32	12	9	142	24.48
<b>Total of Metacognitive strategies:</b>	21	36	21	13	35	38	16	15	195	33.62



II. Cognitive strategies	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
C1 Resourcing										
C1.1 Look up in dictionary	0	0	19	0	0	0	10	0	29	5.00
C1.2 Fit meaning into context	0	0	3	0	0	0	4	0	7	1.21
<b>Total of C1:</b>	0	0	22	0	0	0	14	0	36	6.21
C2 Grouping										
C2.1 Make use of grouping	0	0	0	0	1	0	0	0	1	0.17
<b>Total of C2:</b>	0	0	0	0	1	0	0	0	1	0.17
C4 Summarizing										
C4.1 Summarize the content read	0	0	0	1	0	0	0	2	3	0.52
<b>Total of C4:</b>	0	0	0	1	0	0	0	2	3	0.52
C5 Deduction										
C5.1 Apply known rules	3	2	3	0	6	1	2	2	19	3.28
<b>Total of C5:</b>	3	2	3	0	6	1	2	2	19	3.28
C6 Imagination										
C6.1 Visualize information	6	20	0	18	0	4	0	28	76	13.10
<b>Total of C6:</b>	6	20	0	18	0	4	0	28	76	13.10
C7 Auditory representation										
C7.1 Vocalize	20	1	1	15	3	12	0	12	64	12.19
<b>Total of C7:</b>	20	1	1	15	3	12	0	12	64	12.19
C8 Elaboration										
C8.1 Activate known vocabulary	3	2	3	3	15	5	0	1	32	5.52
C8.2 Activate previous knowledge	0	0	0	2	2	0	0	0	4	0.69
C8.3 Relate to personal experience	0	4	0	2	2	1	0	0	9	1.55
<b>Total of C8:</b>	3	6	3	7	19	6	0	0	45	7.76



	Experimental Group				Control Group					
<b>II. Cognitive strategies</b>	P1	P2	P3	P4	P5	P6	P7	P8	Total	%
C9 Transfer										
C9.1 Translate into Thai	26	9	19	24	7	18	23	26	152	26.21
<b>Total of C9:</b>	26	9	19	24	7	18	23	26	152	26.21
C10 Inferencing										
C10.1 Guess unknown words	2	6	9	4	4	6	4	5	40	6.90
C10.2 Infer overall meaning from context	0	1	0	0	0	0	0	0	1	0.17
C10.3 Make a prediction	0	1	0	0	0	0	0	0	1	0.17
C10.4 Make use of illustrations while reading	0	0	0	0	0	0	0	0	0	0.00
C10.5 Identify reference	4	2	2	0	1	1	1	0	11	1.90
<b>Total of C10:</b>	6	10	11	4	5	7	5	5	53	9.14
<b>Total of Cognitive strategies:</b>	44	47	58	54	38	36	44	63	385	66.38
<b>Total of the 2 main categories:</b>	65	83	79	67	74	74	60	78	580	100.00



**APPENDIX K: Data on Reading Logs**



### Overall Types and Frequencies of Reading Log Data

	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>I. Metacognitive strategies</b>										
M1 Advance Organization										
M1.1 Guess from title or sub-title	2	2	0	2	1	0	0	0	7	3.85
M1.2 Preview the text	1	1	0	0	0	0	1	0	3	1.65
M1.3 Set a purpose in reading	1	0	0	0	0	0	1	1	3	1.65
M1.4 Skim read the text	2	2	2	0	3	2	1	2	14	7.69
<b>Total of M1:</b>	6	5	2	2	4	2	3	3	27	14.84
M3 Selective Attention										
M3.1 Pay attention to key words	0	1	0	1	1	0	0	0	3	1.65
M3.2 Pay attention to the use of punctuation marks	3	0	0	1	0	0	0	0	4	2.20
M3.4 Ignore insignificant/unknown words	2	0	0	2	0	1	2	1	8	4.40
<b>Total of M3:</b>	5	1	0	4	1	1	2	1	15	8.24
M4 Self-monitoring										
M4.9 Read ahead	2	1	1	0	0	0	0	0	4	2.20
M4.11 Reread	3	2	2	1	3	4	2	0	17	9.34
M4.12 Read slowly and carefully	1	2	2	0	2	3	1	0	11	6.04
M4.13 Go back to read earlier section	4	0	0	0	0	0	0	0	4	2.20
M4.14 Underline unknown parts	3	0	0	0	0	0	1	0	4	2.20
<b>Total of M4:</b>	13	5	5	1	5	7	4	0	40	21.98
M5 Self-evaluation										
M5.1 Evaluate if reading purpose is met	1	0	0	0	0	0	0	0	1	0.55
M5.2 Evaluate how well the content is understood	0	0	1	1	0	0	0	0	2	1.10
<b>Total of M5:</b>	1	0	1	1	0	0	0	0	3	1.65
<b>Total of Metacognitive strategies:</b>	25	11	8	8	10	10	9	4	85	46.70



	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>II. Cognitive strategies</b>										
C1 Resourcing										
C1.1 Look up in the dictionary	6	3	3	3	1	3	2	1	22	12.09
C1.2 Fit meaning into context	1	0	1	0	0	0	0	0	2	1.10
<b>Total of C1:</b>	7	3	4	3	1	3	2	1	24	13.19
C4 Summarizing										
C4.1 Summarize the content read	1	3	0	0	0	0	0	1	5	2.75
<b>Total of C4:</b>	1	3	0	0	0	0	0	1	5	2.75
C5 Deduction										
C5.1 Apply known rules	2	2	1	4	0	0	1	2	12	6.59
<b>Total of C5:</b>	2	2	1	4	0	0	1	2	12	6.59
C6 Imagery										
C6.1 Visualize information	1	0	0	1	2	0	0	0	4	2.20
<b>Total of C6:</b>	1	0	0	1	2	0	0	0	4	2.20
C8 Elaboration										
C8.1 Activate known vocabulary	1	0	0	1	0	0	0	0	2	1.10
C8.2 Activate previous knowledge	3	2	1	2	3	0	0	1	12	6.59
C8.3 Relate to personal experience	0	0	0	0	0	0	0	0	0	0.00
<b>Total of C8:</b>	4	2	1	3	3	0	0	1	14	7.69
C9 Transfer										
C9.1 Translate into Thai	1	0	1	4	0	1	1	0	8	4.40
<b>Total of C9:</b>	1	0	1	4	0	1	1	0	8	4.40
C10 Inferencing										
C10.1 Guess unknown words	2	2	3	2	3	0	2	2	16	8.79
C10.2 Infer overall meaning from context	0	0	0	0	0	0	0	0	0	0.00
C10.3 Make a prediction	0	0	0	0	0	0	0	1	1	0.55
C10.4 Make use of illustrations while reading	0	0	0	0	1	0	0	0	1	0.55
<b>Total of C10:</b>	2	2	3	2	4	0	2	3	18	9.89
<b>Total of Cognitive strategies:</b>	18	12	10	17	10	4	6	8	85	46.70



	Experimental Group				Control Group				Total	%
	P1	P2	P3	P4	P5	P6	P7	P8		
<b>III. Socail/affective strategies</b>										
S/A1 Questioning for clarification										
S/A1.1 Ask friends	7	2	1	0	0	1	0	0	11	6.04
<b>Total of S/A1.1:</b>	7	2	1	0	0	1	0	0	11	6.04
S/A2 Cooperation										
S/A2.1 Read & discuss with friends	1	0	0	0	0	0	0	0	1	0.55
<b>Total of S/A2.1:</b>	1	0	0	0	0	0	0	0	1	0.55
<b>Total of Social/affective strategies:</b>	8	2	1	0	0	1	0	0	12	6.59
<b>Total of the 3 main categories:</b>	51	25	19	25	20	15	15	12	182	100.00



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