การศึกษากลวิธีอ่านที่วิศวกรโยธาไทยใช้ในการอ่านสื่อความปลอดภัยภาษาอังกฤษ

A STUDY OF STRATEGIES TO READ USED BY THAI CIVIL ENGINEERS IN
READING ENGLISH SAFETY MATERIALS

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GRADUATE SCHOOL Srinakharinwirot University
2018

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A STUDY OF STRATEGIES TO READ USED BY THAI CIVIL ENGINEERS IN READING ENGLISH SAFETY MATERIALS

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BY
WATCHARAPONG TANTAWAT

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The purpose of this research study is to investigate the use of reading strategies in the reading of English safety materials by Thai civil engineers. Significant attention will also be given to the relationship between the work experience of Thai civil engineers and their use of different types of reading strategies. The participants were 53 Thai civil engineers who had work experience of durations from 1 to 18 years. This study focused on the use of the Metacognitive Reading Strategies which consisted of Global Reading, Support Reading and Problem-Solving Strategies. Data on the use of reading strategies of the participants was collected by using the Survey of Reading Strategies (SORS) of Mokhtari & Sheorey (2002). The result of the study reported that Thai civil engineers used a wide range of strategies but there was a preference for global reading strategies, followed by problem-solving strategies and support strategies. The findings also revealed the use of cognitive strategies, compensation strategies and social strategies in reading English safety materials. The results of this study also explain the relationship between Thai civil engineers' work experience and their use of reading strategies: explicitly, that their use of reading strategies did not have a significant correlation with work experience. Thai civil engineers who had longer work experience were likely to use only slightly fewer strategies to read than Thai civil engineers who had less work experience.

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CHAPTER 1

INTRODUCTION

Background of the study

Nowadays, English is used for communication in construction projects. Construction documents of multinational companies as well as of Thai companies are frequently written in English in order that both Thai and foreign staff can understand them. Safety materials are documents written in English which Thai civil engineers use during construction on site. Civil engineers who can understand the contents of safety materials will be more able to safeguard both themselves, and the workers whom they supervise, from accidents during construction. This study aims to investigate the strategies that Thai civil engineers use when they read safety materials.

Civil engineers face risks of accident while working for construction projects because they supervise risky work, such as having to work in a location where there is a risk of falling, or risks connected with using flame to cut and weld steel. Therefore, communication for safety is very important for civil engineers because it will help them understand how to work safely (Sitakalin & Opasee, 2002). According to Sitakalin and Opasee, the purpose of safety communication is to inform about risks of, accidents to advise of ways to avoid accidents and make precautions so that receivers of communication develop expertise in the practice of safety. Various media can be used for safety communication such as mass communication media, interpersonal media, and activity media. Nevertheless, the media most frequently

used for safety communication are materials for reading such things as booklets and manuals.

Safety materials are media used for safety communication by reading to give correct and safe procedures for construction as well as to give warnings about the dangers inherent in the work. Leeratanapanich (2005) conducted a study of communication media for employees to increase their work safety. The researcher found that safety materials were effective media because employees obtained more information about safety from this media than other media. Moreover, employees gained a good understanding from reading safety materials. Leeratanapanich emphasized that safety communication must make receivers truly able to receive messages about safety and the receivers must understand these messages. If they do not understand work procedures and caution in safety materials, both engineers and construction workers are more likely to be at risk of accident while working. For the reasons previously mentioned, safety materials are frequently used in construction.

In Thailand safety materials are written in English increasingly more often because a number of foreign staff of multinational construction companies are working in Thailand at present. Construction professionals ought to use communication media which both Thai professionals and foreign professionals can understand. Therefore, safety materials ought to be written in English in order that both Thai and foreign staff can understand them. Normally, Thai civil engineers are required to read safety materials written in English rather than safety materials written in both Thai and English. Thai civil engineers have to read safety materials to acquire knowledge about safety for not only working but also communicating with other internal and external construction parties (Roongrojdee, 2001) such as safety officers,

auditors, peers, customers, and the occupational safety and health division of the Ministry of Labour. Therefore, reading English is a necessity for Thai civil engineers to get their work done.

As previously mentioned, an ability to use English is necessary for Thai civil engineers. However, because Thai engineers work domestically, they have limited opportunities to use and practice English. Sophabutr (2012) interviewed Thai peers and lecturers in Engineering to propose an approach to develop the competencies of Thai engineers. They expressed the opinion that Thai engineers were not good at using English because Thai engineers were not in an English environment. English skills of Thai engineers were inferior because they could use only Thai while working as well as using textbooks written in Thai instead of English while studying in universities. Also, Uakarn (2014) conducted a study of the core competency of Thai engineers by using a questionnaire to collect data from a sample of Thai engineers who resided in Bangkok, carrying out in-depth interviews with professionals who had at least 10 years experience in the engineering profession. The findings of this study showed that English proficiency of Thai engineers was at a significantly low level. Therefore, a research study on using English in the context of Thai engineers would be useful for developing the English skills of Thai engineers.

In summary, Thai civil engineers must understand safety materials written in English in order to follow work procedures and to be aware of the importance of caution and the instances in which it must be exercised. The researcher conducts a study on strategies in reading English safety materials used by Thai civil engineers in order to understand how they read. This research can be used as a guideline to develop the English reading skills of Thai engineers.

Purposes of the Study

1. To investigate the strategies Thai civil engineers use in reading English safety materials.

2. To investigate the relationship between their work experience and the strategies they use in reading safety materials.

Research Questions

1. What strategies do Thai civil engineers use in reading English safety materials?

2. Is there a relationship between their work experience and the strategies they use in reading English safety materials?

Significance of the Study

The number of studies on reading English in the context of engineering professionals is limited. The findings of this study will be resourceful information for strategies used by Thai engineers. It can also be used for designing a training course in reading English for specific purposes. By conducting a suitably designed English course, the executives can enhance the language potential of Thai engineers which would further assist the success of their organizations. Also, Thai civil engineers themselves would be assisted in improving their reading skills, which in turn would further enhance their opportunities for career advancement.

Scope of the Study

   The strategies used by Thai civil engineers in reading safety materials were obtained through the questionnaire distributed to Thai civil engineers working for construction companies.

Definition of Terms

   Safety materials refers to handbooks, billboards, tags on machines and instructions demonstrating safety procedure and caution.

   Safety procedure refers to documented procedure for building construction. The purpose of a safe work procedure is to reduce the risk to health and safety in the workplace and reduce the likelihood of an injury by instructing engineers and workers how to work safely when carrying out tasks on sites and the dangers which arise from accidents in the construction industry.

   Strategies in reading briefly refers to the skills, techniques, methods and behaviors that readers use to increase their reading comprehension or overcome their reading barrier (Chen & Intaraprasert, 2014). Strategies in reading help readers to a fuller understanding of texts (Thampradit, 2008).

   Technical English refers to English used for writing scientific and technical text. Technical English is short, clear, and precise. Technical English consists of diagrams, tables, maps, flow charts, graphs, and units of measurement to demonstrate scientific and technical information.

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REVIEW OF THE LITERATURE

This study aims to investigate the strategies that Thai civil engineers use in reading and the relationship between work experience and the strategies used in reading. According to Snow (2002, as cited in Chanprasert, 2013), reading is a process of constructing a meaning through interaction and involvement of the reader, strategies used and the material read. Therefore, this chapter presents an overview of safety materials used by engineers and strategies they use which are the elements of reading. Also, a review of previous studies on strategies in reading are presented in order to demonstrate the general use of strategies of Thai EFL learners in reading.

Safety Materials and Technical English

Safety materials can be explained as documents giving information on how to work safely (Roongrojdee, 2001) as well as what should be done when accidents happen (Shigekazu, 1995). They consist not only of text but also of graphics. Safety materials consist of various materials such as manuals, check lists, lock-out tags, brochures, posters, warning signs or warning notices, instruction sheets and specifications of equipment (Vecchio-Sadus, 2007). Details of each safety materials are explained as follows:

1. Safety manuals are precautions and guides to requirements for safe working produced by consolidating the rules and requirements for safety in the workplace. Safety manuals present how to work or use equipment correctly and actions that are prohibited because they can cause damage or danger.

2. Checklists are checking tools or guideline tools (e.g., operating checklists) to help prevent accidents and miscommunications, to promote better operating equipment, and make informed decisions about operation.

3. Lock-out tags in relation to faulty equipment or work in progress are used to clearly and simply communicate potential danger (Shigekazu, 1995).

4. Brochures are small instructional leaflets on particular topics such as safe lifting, electrical safety, personal fitness, through to general items such as sources of further information to more detailed reports or books. Brochures would be suitable for general distribution in working areas and can consist of printed matter in several languages.

5. Posters use illustrations and symbols to provide information. Posters and signs are written by using big fonts in order that they are easy to read. Posters can be classified as positive posters and negative posters. Positive posters inform of the benefits of working safely, whereas negative posters warn of possible danger. Posters are a safety material used frequently.

6. Warning signs, also called warning notices, are signed and tagged in construction areas and on machines in order to point out problems which could injure workers or damage machines.

7. Instruction sheets and specifications of equipment inform how to work with equipment and how equipment can be used.

The difference between safety materials and general texts is that safety materials are written in technical English. The characteristics of technical English are explained as follows:

1. Technical English is short, clear, and precise, useful, and visual.

2. Technical English is impersonal. It simply describes the events or the people or things that are affected by these events (Wiriyachitra & Apichattrakul, 1982).

3. Technical English has specialized words and jargon and ways to use them, which we do not use in the ordinary, daily manner. The words used in our ordinary transactions are quite distinct from those used in Technical English. Units of measurement for length, weight, time, volume and so on are used in Technical English. Abbreviations of units or unit symbols are always used in Technical English.

4. Technical English consists of diagrams, tables, maps, flow charts, and graphs to demonstrate scientific and technical information.

5. Technical English uses the imperative form in order to instruct work procedure or prohibition.

6. Technical English focuses on useful and concise information rather than on the styles or attitude of the writers (Roongrojdee, 2000).

Technical English is used to write safety materials because construction safety materials aim to provide scientific and technical information which is generally related to materials, machines, and work procedure. Accordingly, the vocabulary of safety materials mainly consists of names of construction equipment, tools' dimension descriptions, and vocabulary of quality such as *failure*, *pass*, *fit*, *suitable*; scientific units, the vocabulary of operation such as *check*, *fasten*, *perform*, *avoid*, *supply*, *fit*, *insert*; allowing and preventing verbs such as *allow*, *permit*, *enable*, *prevent*, and *stop*.

In summary, safety materials are used to provide information on how to work safely, what can be done, and what cannot be done in order to avoid accidents as well as what has to be done if accidents happen. Safety materials are written in technical

English. They have to be clear, concise and provide useful information. They are not only short texts with technical vocabulary, but also graphics. Therefore, the main strategies which readers use to read safety materials would be the strategies that relate to graphics, vocabulary, and short texts.

Strategies in Reading and Their Classification

Strategies in learning language can be classified into two types: learning strategies, and reading or comprehension strategies (Thampradit, 2008). Learning strategies are strategies that enhance learning efficiency whereas reading strategies are strategies that help readers understand texts more thoroughly (Thampradit, 2008). Reading strategies are defined by a number of researchers. According to Chen and Intaraprasert (2014), reading strategies are skills, techniques, methods, and behaviors that readers use to increase their reading comprehension or overcome their reading barriers. According to Anderson (1991), reading strategies are cautions and cognitive measures adopted by the reader for acquiring, storing and amending new information. According to Garner (1987), reading strategies are generally deliberate, playful activities undertaken by active learners, many times to remedy perceived cognitive failure. According to Barnett (2002, as cited in Souhila, 2013), reading strategies are the comprehension processes that readers use in order to make sense of what they read. According to Afflerbach, Pearson, and Paris (2008), reading strategies are deliberate, goal-directed attempts to control and modify the reader's efforts to decode text, understand words and construct meanings of text. They are "the cognitive operations that take place when readers approach a text with the purpose to make sense of what they read. Simply put, reading strategies is a tool that helps learners

know what to do and how to do when they do not understand what they read (Anugkakul, 2015). Reading strategies help learners have more reading comprehension and reduce failure in reading.

Several researchers have attempted to classify strategies to read as follows:

1. Johnston (1983, as cited in Razi, 2011) classifies reading strategies into two categories: the strategies assisting the reader to construct the meaning based on a model, and the strategy monitoring comprehension.

2. Block (1986) classifies reading strategies into two categories: general strategies and local strategies. General strategies involve anticipating content, recognizing text structure, integrating information, questioning information in the text, interpreting the text, using general knowledge and associations, commenting on behavior or process, monitoring comprehension, correcting behavior and reacting to the text, while local strategies involve paraphrasing, rereading, questioning meaning of a clause or sentence, questioning meaning of a word, and solving vocabulary problems.

3. Barnett (1988) classifies reading strategies into two categories: word-level strategies and text-level strategies. Word-level strategies involve using context to guess word meanings, identifying the grammatical category of words, following reference words, and recognizing meanings through word families and formation. Text-level strategies deal with strategies which are essential in order to read the passage as a whole or large parts of the passage. They involve considering background knowledge, predicting, using titles and illustrations to understand, reading with a purpose, skimming, and scanning.

4. Carrell (1989) classifies reading strategies into two categories: global strategies and local strategies. Global strategies relate to background knowledge, text gist and textual organization while local strategies relate to sound-letter, word-meaning, sentence syntax and text details.

5. Oxford (1990) classifies strategies to learn the second language into two main categories: direct strategies and indirect strategies. The direct strategies consist of cognitive strategies, memory strategies, compensating strategies whereas the indirect strategies consist of metacognitive strategies, affective strategies and social strategies. These six sub-categories of the strategies are applied to the four language skills: listening, reading, speaking and writing. Oxford's classification is well-known and widely referred to in research because Oxford explains all clusters of reading strategies. Oxford explains the strategies in the six sub-categories as follows:

5.1 Memory strategies

Memory strategies are the strategies which help readers to learn and retrieve information but do not necessarily involve deep understanding (Oxford, 2003). The strategies in this sub-category and the tasks involved with them are identified as follows:

5.1.1 The strategy *Creating metal linkages* consists of the task *Grouping*; *Associating/elaborating*; and *Placing new words into a context*.

5.1.2 The strategy *Applying images and sounds* consists of the task Using imagery; Semantic mapping; Using keywords; and Representing sounds in memory.

5.1.3 The strategy *Reviewing well* consists of the task *Structure reviewing*.

5.1.4 The strategy *Employing action* consists of the task *Using physical response or sensation*; and *Using mechanical techniques*

5.2 Cognitive strategies

Cognitive strategies are the strategies which help readers manipulate language material in direct ways (Oxford, 2003). The strategies in this sub-category and the tasks which involve them are identified as follows:

5.2.1 The strategy *Practicing* consists of the task *Repeating*; *Formally practicing with sound system and writing systems*; *Recognizing and using formulas and patterns*; *recombining*; and *Practicing naturalistically*.

5.2.2 The strategy *Receiving and sending messages* consists of the task *Getting the idea quickly*; and *Using resources for receiving and sending messages*.

5.2.3 The strategy *Analyzing and reasoning* consists of the task *Reasoning deductively*; *Analyzing expression*; *Analyzing contrastively across language*; *Translating*; and *Transferring*.

5.2.4 The strategy *Creating structure for input and output* consists of the task *Taking notes*; *Summarizing*; and *Highlighting*.

5.3 Compensation strategies

Compensation strategies are the strategies which help readers compensate for missing knowledge (Oxford, 2003). The strategies in this sub-category and the tasks involve them are identified as follows:

5.3.1 The strategy *Guessing intelligently* consists of the task *Using linguistic clues*; and *Using other clues*.

5.3.2 The strategy *Overcoming limitations in speaking and writing* consists of the task *Switching to the mother tongue*; *Getting help*; *Using mime or gesture*; *Avoiding communication partially or totally*; *Selecting the topic*; *Adjusting or approximating the message*; *Coining words*; and *Using a circumlocution or synonym*.

5.4 Metacognitive strategies

Metacognitive strategies are the strategies readers use for managing their own learning process overall (Oxford, 2003). The strategies in this sub-category and the tasks involve them are identified as follows:

5.4.1 The strategy *Centering your learning* consists of the task *Overviewing and linking with already known materials*; *Paying attention*; and *Delaying speech production to focus on listening*.

5.4.2 The strategy *Arranging and planning your learning* consists of the task *Finding out about language learning, organizing*; *Setting goals and objectives*; *Identifying the purposes of a language task: purposeful listening/reading/speaking/ writing*; *Planning for a language task*; and *Seeking practice opportunities*.

5.4.3 The strategy *Evaluating* your learning consists of the task *Self-monitoring*; and *Self-evaluating*.

5.5 Affective strategies

Affective strategies are the strategies used for controlling emotions, attitudes, motivations, and values that influence language learning (Oxford, 1990). The strategies in this sub-category and the tasks involve them are identified as follows:

5.5.1 The strategy *Lowering your anxiety* consists of the task *Using progressive relaxation*; *Deep breathing or meditation*; *Using music*; and *Using laughter*.

5.5.2 The strategy *Encouraging yourself* consists of the task *Making positive statements*; *Taking risks wisely*; and *Rewarding yourself*.

5.5.3 The strategy *Taking your emotional temperature* consists of the task *Listening to your body*; *Using a checklist*; and *Writing a language learning diary*.

5.6 Social strategies

Social strategies are the strategies help readers work with others and understand the language (Oxford, 2003). The strategies in this sub-category and the tasks involve them are identified as follows:

5.6.1 The strategy *Asking questions* consists of the task *Asking for clarification or verification*; and *Asking for correction*.

5.6.2 The strategy *Cooperating with others* consists of the task *Cooperating with peers*; and *Cooperating with proficient users of the new language*.

5.6.3 The strategy *Empathizing with others* consists of the task *Developing cultural understanding*; and *Becoming aware of others' thoughts and feelings*.

6. Schmitt (1990) classifies reading strategies into three categories: before reading strategies, during reading strategies and after reading strategies. Before reading strategies involve making a prediction about the meaning of the text, checking the prediction, previewing the text, and having a purpose of reading. During reading strategies involve self-questioning and using prior knowledge. After reading

strategies involve summarizing.   Fix-up strategies also involve after reading strategies.

7. Anderson (1991) classifies reading strategies into three categories: cognitive reading strategies, metacognitive reading strategies and compensating reading strategies.   Anderson explains the tasks which involve cognitive reading strategies as follows:

7.1 Predicting the content of the text

7.2 Concentration on grammar to understand construction of the text.

7.3 Finding main idea

7.4 Expanding vocabulary and grammar

7.5 Guessing meaning from context

7.6 Analyzing theme, style and connections

7.7 Distinguishing between opinions and facts

7.8 Breaking down larger phrases into smaller parts

7.9 Translating what readers know in their first language to the language which the readers read.

7.10 Creating graphic organizers to understand the relationship between words and ideas.

7.11 Summarizing of what readers read to understand main ideas.

Anderson explains the tasks which involve meta cognitive reading strategies as follows:

7.12 Setting goals of reading.

7.13 Listing new vocabularies for the next reading

7.14 Working with classmates

7.15 Reviewing what readers already know

7.16 Evaluating what readers have learned.

Anderson explains the tasks which involve compensating reading strategies as follows:

7.17 Relying on what readers know

7.18 Taking notes

7.19 Remembering what readers understand from reading

7.20 Reviewing the purpose and tone of reading

7.21 Picturing scenes in readers' mind

7.22 Reviewing key ideas and details.

7.23 Using physical action to remember information.

7.24 Classification words into meaningful groups

8. Warnick (1996) classifies reading strategies into four categories: bottom-up strategies, top-down strategies, metacognitive strategies, and socio-affective strategies. Bottom-up strategies are strategies readers use to decode the linguistic features in order to comprehend the text (Oranpattanachai, 2004). They are dependent on orthographical functions of language such as recognizing and analyzing symbols, words, and grammatical functions for comprehension. Top-down strategies are strategies readers use to construct the meaning from the text by using their previous knowledge and their operational knowledge about how to approach texts (Oranpattanachai, 2004). They integrate the cognitive behaviors of readers such as hypothesizing about the text, predicting the forthcoming information, inferring meaning, and combining background knowledge. Metacognitive strategies require

readers to observe their own behaviors during the reading process, such as commenting on the text and the tasks related to it and monitoring their own comprehension of the text while socio-affective strategies deal with readers as individuals in society by pointing out their social role such as relating personal memory and reacting to text content (Razı, 2011).

In summary, a number of scholars classify reading strategies into various categories and the Oxford classification is widely referred to because it explains all the clusters of reading strategies. However, this study focuses on metacognitive reading strategies only because they are essential for readers who learn English as a foreign language such as Thai civil engineers. According to Anderson (2002), the use of metacognitive reading strategies can enhance the reading comprehension of readers because the significant positive relationship between the use of metacognitive reading strategies and reading comprehension while the reading of foreign languages is found.

Metacognitive Reading Strategies

The concept of metacognition in theories of education was first introduced by John Flavell in the 1970s (Chanprasert, 2013). Metacognition is the process by which learners recognize and understand their own thinking and learning. It is defined as thinking about thinking and developing the process of solving problems and answering questions (Fisher, 1998). It is the knowledge of the learners' cognition and the self-control mechanisms they exercise when monitoring and regulating learning comprehension (Mokhtari & Reichard, 2002). Metacognition has been focused in many studies as a significant factor for readers to achieve success in reading because it can lead to success in reading comprehension.

The process of metacognition is about planning, monitoring, and evaluation. Firstly, learners develop a plan to approach learning tasks. Secondly, learners use "fix-up" strategies to monitor their understanding when meaning breaks down. Lastly learners evaluate their thinking after completing the learning tasks (Fogarty, 1994, as cited in U.S. Department of Education, Office of Vocational and Adult Education, 2010). Due to this process, readers know what they comprehend as well as what they do not comprehend about the text they read. Consequently, readers know how to monitor their comprehension - i.e. readers know which reading strategies can help them better comprehend the texts they read and use such strategies to improve their reading comprehension. The U.S. Department of Education, Office of Vocational and Adult Education (2010) recommends instructors to instruct learners in metacognition for reading, writing, computing mathematics, learning social studies and science.

The metacognitive reading strategies help readers to be able to plan, check, and monitor their reading in order that they are able to evaluate problems and their comprehension by themselves; consequently readers are able to evaluate, after they complete reading, how much they can achieve their objectives in reading and use proper strategies to re-read the text they do not comprehend.

Metacognitive reading strategies are classified by researchers as follows:

1. Oxford (1990) classifies metacognitive reading strategies into three sub-categories as follows:

1.1 Centering your learning is a strategy which helps readers understand why reading is being done. Also, it helps readers to relate their previous theoretical knowledge to the upcoming reading, which in turn helps them understand the writers' meanings (Peñuela, 2018). This strategy consists of the following tasks:

1.1.1 Overviewing and linking with already known materials

1.1.2 Paying attention; and delaying speech production to focus on listening

1.2 Arranging and planning your learning is a strategy help readers set their own aims for reading (Peñuela, 2018). This strategy consists of the following tasks:

1.2.1 Finding out about language learning, organizing

1.2.2 Setting goals and objectives

1.2.3 Identifying the purposes of a language task

1.2.4 Purposeful listening/reading/speaking/writing

1.2.5 Planning for a language task

1.2.6 Seeking practice opportunities

1.3 Evaluating your learning refers to evaluating readers' own progress in understanding the text they read. This strategy consists of the following tasks:

1.3.1 Self-monitoring

1.3.2 Self-evaluating.

2. Anderson (2002) classifies metacognitive reading strategies into five primary tasks as follows:

2.1. Preparing and planning for effective reading

2.2. Deciding when to use particular reading strategies

2.3. Knowing how to monitor strategy use

2.4. Learning how to orchestrate various strategies

2.5. Evaluating reading strategy use

3. Mokhtari and Sheorey (2002, as cited by Ramli, Darus, and Bakar, 2011) divide metacognitive reading strategies into three sub-categories as follows:

3.1 Global reading strategies are intentional, carefully planned techniques by which learners monitor or manage their reading (Mokhtari & Sheorey, 2002). The use of Global reading strategies aims at a global analysis of the reading text (Rastegar, Kermani, & Khabir, 2017). The use of these strategies helps readers ready themselves to comprehend the main text. Readers carefully plan their reading by using the following tasks (Mokhtari & Reichard, 2002):

3.1.1 Setting purpose for reading

3.1.2 Activating prior knowledge

3.1.3 Checking whether text content fits purpose

3.1.4 Predicting what text is about,

3.1.5 Confirming predictions

3.1.6 Previewing text for content

3.1.7 Skimming to note text characteristics

3.1.8 Making decisions in relation to what to read closely

3.1.9 Using context clues

3.1.10 Using text structure

3.1.11 Using other textual features to enhance reading comprehension.

3.2 Problem-solving strategies are strategies by which readers work directly with text to solve problems while reading. These strategies help readers deal with problems in the real act of reading a text while the text becomes difficult to understand. Problem-solving strategies are localized and focused techniques used

when problems develop in understanding textual information (Mokhtari & Sheorey, 2002). Problem-solving strategies mostly involve the following tasks (Mokhtari & Reichard, 2002):

3.2.1 Reading slowly and carefully

3.2.2 Adjusting reading rate

3.2.3 Paying close attention to reading

3.2.4 Pausing to reflect on reading

3.2.5 Re-reading

3.2.6 Visualizing information read

3.2.7 Reading text out loud

3.2.8 Guessing meanings of unknown words

3.3 Support strategies are strategies by which readers use basic support mechanisms to help them read. Support strategies mostly involve the following tasks (Mokhtari & Reichard, 2002):

3.3.1 Taking notes while reading

3.3.2 Paraphrasing text information,

3.3.3 Revisiting previously read information

3.3.4 Asking self questions

3.3.5 Using reference materials as aids

3.3.6 Underlining text information

3.3.7 Discussing reading with others

3.3.8 Writing summaries of reading

4. Israel (2007, as cited in Wardah, 2014) classifies metacognitive reading strategies into 3 clusters as follows:

4.1. Planning strategies are the strategies readers use before reading in order to enhance their comprehension. Planning strategies are also called "before reading strategies" or "pre-reading strategies" since readers use these strategies before reading. According to Wardah (2014), Planning strategies consist of the following tasks:

4.1.1 Activating prior knowledge

4.1.2 Overviewing information in the text

4.1.3 Relating text to text

4.1.4 Relating text to self.

4.2 Monitoring strategies are the strategies readers use to help them pay attention to the construction of meaning and to correct breakdowns in their reading comprehension Wardah (2014). Monitoring strategies are also called "during reading strategies" since readers use these strategies during reading. According to Wardah (2014), Monitoring strategies consist of the following tasks:

4.2.1 determining word meaning

4.2.2 Questioning

4.2.3 Reflecting

4.2.4 Monitoring;

4.2.5 Summarizing

4.2.6 Looking for important information

4.3. Evaluating strategies are the strategies which allow readers to think about what they read and the efficiency with which reading is performed. Evaluating strategies are also called "after reading strategies" or "post-reading strategies" since

readers use these strategies after reading. According to Wardah (2014), Evaluating strategies consist of the following tasks:

4.3.1 Thinking like the author

4.3.2 Evaluating the text

4.3.3 Anticipating use of knowledge

4.3.4 Monitoring for meaning, knowing when you know, knowing when you don't know

4.3.5 Using and creating schema, making connections between the new and the known, building and activating background knowledge

4.3.6 Asking questions, generating questions before, during, and after reading that lead you deeper into the text

4.3.7 Determining importance, deciding what matters most, what is worth remembering

4.3.8 Inferring, combining background knowledge with information from the text to predict, conclude, make judgments, interpret

4.3.9 Using sensory and emotional images, creating mental images to deepen and stretch meaning

4.3.10 Synthesizing-- creating an evolution of meaning by combining understanding with knowledge from other texts/sources.

The use of metacognitive reading strategies in reading second languages has been studied by a number of researchers. The use of metacognitive reading strategies enhances the reading comprehension of readers (Anderson, 2002). The high use of metacognitive reading strategies is correlated with high achievement in the reading of good readers (Mokhtari & Reichard, 2002) whereas poor readers are less proficient in

using these strategies to solve their problems in reading (Pressley, 2002, as cited in Chanprasert, 2013). Studies concerning second language reading on English, French, Japanese, and Chinese language students demonstrated that the relationship between the use of metacognitive reading strategies of readers and their reading comprehension was positive. High proficiency students used more metacognitive reading strategies (Mokhtari & Reichard, 2002; Barnett, 1988; Upton, 1997; Zhang and Seepho, 2013, as cited in Rastegar et al., 2017). For this reason, metacognitive reading strategies can enhance the reading comprehension of learners who learn foreign languages. By using these strategies, readers can achieve success in reading by themselves.

In conclusion, metacognitive reading strategies are the strategies readers use for planning, monitoring and evaluating their own thinking while reading. These strategies concern planning for reading, checking reading comprehension, correcting readers' own previous understanding, setting goals and objectives of reading, and self-monitoring. Previous studies on the use of metacognitive reading strategies show that the more successful readers use metacognitive reading strategies in reading more than the less successful readers (Ahmadi et al., 2013, as cited in Rastegar et al., 2017). Thus, this study focuses on the use of metacognitive reading strategies of Thai civil engineers who learn English as a foreign language because these strategies would appear most likely to help them be more successful in reading a foreign language.

The Survey of Reading Strategies (SORS)

The Survey of Reading Strategies (SORS) is an instrument used for collecting information about the perceived use of reading strategies of respondents. It

has been used in a significant number of studies on reading strategies because the reliability of the SORS is high. Mokhtari and Sheorey (2002) developed the SORS to measure the use of the metacognitive strategies of English as a Second Language (ESL) students. The SORS is developed from the Metacognitive Awareness of Reading Strategies Inventory (MARSI) which is the survey used to measure the use of metacognitive strategies for reading academic or school-related materials (Mokhtari & Reichard, 2002). In this survey, the metacognitive reading strategies are subdivided into three categories: global reading strategies, problem-solving strategies, and support reading strategies. Global reading strategies consist of 13 statements. Problem-solving strategies consist of 8 statements. Support reading strategies consist of 9 statements. All of the reading strategies in the SORS are designed by using frequency survey questions. The frequency survey questions are designed by using check lists, 5-point Likert scale (Likert, 1932). Respondents answer the survey question by rating the frequency with which they believe they use reading strategies while reading on a 5-point Likert scale. The frequency rated by the respondents can be interpreted as high use, moderate use, and low use. The internal consistency reliability coefficients of the SORS determined by Cronbach's alpha for its overall scale was 0.93. Therefore, the SORS demonstrates excellent reliability because its internal consistency reliability coefficient is higher than 0.90. The SORS is adapted to the Online Survey of Reading Strategies by Anderson (2003) in order to measure the use of the metacognitive strategies of English as a Second Language (ESL) readers and English as a foreign language (EFL) readers. The SORS is translated into Thai by Boonkongsaen, Sujinpram, and Verapreyagoon (2016). The original SORS

and the Thai translation of the SORS are presented in appendix A and B respectively. Shown in appendix A, the statements are numbered from 1 to 30.

In this study the researcher chose Mokhtari and Sheorey (2002)'s Survey of Reading Strategies (SORS) as the research instrument because it was specifically designed for measuring metacognitive awareness of EFL readers. This instrument can help to identify the readers' strategies in reading text and consequently it can show which skills of readers should be improved.

Related Studies

Jarijitpaibul (2002) conducted a study of strategies in reading used by Thai Mathayom Suksa five students with different English reading comprehension abilities. The researcher proposed investigating and comparing strategies used by Mathayom Suksa 5 students with advanced and low English reading comprehension abilities. The researcher focused on the use of cognitive reading strategies, metacognitive reading strategies, affective reading strategies, and compensatory reading strategies. The participants of the study were 48 Thai Mathayom Suksa 5 students from different schools in Bangkok. They were classified to be advanced-level and low-level readers based on their English reading comprehension test scores. The instruments used in the study were an English reading comprehension test developed by the researcher and a self-report analysis using retrospective technique. The results of this study found that cognitive reading strategies were used by the participants most frequently, followed by compensatory reading strategies and metacognitive reading strategies, whereas affective reading strategies were used least frequently. The strategy that the Thai students with advanced as well as with low reading ability used most frequently

was cognitive reading strategies. Also, the strategy that the students with advanced as well as with low reading comprehension ability used least frequently was affective reading strategies. The researcher explained that cognitive reading strategies were used most frequently because readers created meaning from what they read by using their cognition and critical thinking. By doing so, the students could create the meaning by themselves, and therefore they had more opportunity to use these strategies to help when they read than they did with the other strategies. The results also showed that Thai students with advanced reading comprehension ability reported the use of cognitive, metacognitive and compensatory reading strategies more frequently than did Thai students with low reading comprehension.

Yutdhana (2007) conducted a study of strategies used by Thai graduate students in online reading. The researcher proposed investigating and comparing strategies used by Thai graduate students of different faculty clusters. The researcher focused on the use of global reading strategies, problem-solving strategies, and support reading strategies. The participants of the study were 205 Thai graduate students of the faculty of social sciences, the faculty of health sciences, and the faculty of sciences and technology. The instrument used in the study was the Online Survey of Reading strategies adapted from the SORS by Anderson (2003). The results of this study revealed that overall, the Thai graduate students used global reading strategies, problem-solving strategies, and support reading strategies with a moderate level of usage. Also, the results showed that the Thai graduate students of the faculty of social sciences and those of the other two faculty clusters significantly differed in their use of reading strategies overall. The researcher explained that schema of the students of the faculty of health sciences and the faculty of sciences and

technology might play a greater role than their language background in comprehending scientific text and cause their use of reading strategies to differ from the use of the strategies of students of the faculty of social sciences.

Thampradit (2008) conducted a study of strategies used by university engineering students in reading expository texts. The researcher proposed investigating and comparing strategies used by engineering students of different departments. The researcher focused on the use of cognitive strategies, metacognitive strategies and compensating strategies. The participants in the research were 1,080 Thai fourth year engineering students studying in six public universities in Bangkok. 792 students were classified to be high proficiency readers and 288 students were classified to be low proficiency readers based on their English reading test scores. The instrument used in the study was a questionnaire based on Anderson's idea of reading strategies classification (Anderson, 1991). The results of this study revealed that the students used cognitive, metacognitive and compensating strategies with a moderate level of usage. On average, the cognitive reading strategies were used most and the metacognitive reading strategies were used least. The researcher explained that the cognitive reading strategies were used most because reading skill was complicated and importantly involved with cognition of readers. The results also showed that the Thai students in the department of computer engineering differed in their use of strategies overall from Thai students in the department of mechanical engineering, chemical engineering, and civil engineering because the nature of computer engineering disciplines were different from those of the other departments. Also the nature of students in the department of computer engineering was different from that of students in other departments.

Ingkakul (2010) conducted a study of strategies used by Thai resident physicians and Thai medical students in reading academic materials. The researcher proposed investigating and comparing strategies used by Thai resident physicians who were able readers and Thai medical students who were less able readers. The researcher focused on the use of global reading strategies, problem-solving strategies, and support reading strategies. The participants of the study were 30 Thai resident physicians and 30 Thai medical students. The instrument used in the study was the SORS. The results of this study showed that the problem-solving strategies were used by the participants most frequently, followed by global and support strategies. None of the strategies were used at low level. Also, the results demonstrated that in overall, the resident physicians used strategies at a high level while the medical students used strategies at a moderate level. The researcher explained that the use of strategies of the medical students was less than of the resident physicians because the medical students were less able readers. The experienced readers tended to use a higher number of different strategies to assist their reading.

Oranpattanachai (2010) conducted a study of perceived reading strategies used by Thai pre-engineering students at a college in Thailand. The researcher proposed investigating the effect of reading proficiency on the English reading processes of high and low proficiency readers. The researcher focused on the use of 'local' or bottom-up strategies as well as the use of 'global' or top-down strategies. The participants of the study were 90 Thai pre-engineering students chosen by the researcher. They were classified to be high and low proficiency readers based on a combination of their English grades and their reading test scores. The instrument used in the study was a metacognitive reading strategy awareness questionnaire. The

strategies contained in the questionnaire were drawn from the questionnaire of Oranpattanachai (2004) and Carrell (1989). The results of this study showed that the students who were high proficiency readers used perceived strategies significantly more frequently than the students who were low proficiency readers. Also, the students who were high proficiency readers perceived that they employed top-down strategies significantly more frequently than the students who were low proficiency readers did. These findings confirmed that high proficiency readers should use strategies while reading more than low proficiency readers did. The results of this study also showed that both high and low proficiency readers used top-down strategies significantly more frequently than the bottom-up strategies. However, this finding conflicted with other studies which showed that low proficiency readers used bottom-up strategies more frequently than the top-down strategies due to the difference of methods of study.

Yaemtui (2015) conducted a study of strategies in reading used by able English users and less able English users among Thai students studying in a high school. The researcher proposed investigating the relationship between the use of strategies of able English users and of less able English users. The researcher focused on the use of cognitive reading strategies, metacognitive reading strategies and compensating reading strategies. The participants of the study were 74 Thai high school students. They were classified as able and less able English users based on their test scores for the Reading and Writing summative exam. The instrument used in the study was a questionnaire adapted from Anderson's Reading Strategies (Anderson, 1991) and the SORS. The results of this study showed that there was no significant difference between the overall strategies used by the students who were

able English users and the students who were the less able English users. However, able English users tended to use metacognitive reading strategies more frequently than less able English users. The researcher explained that skilled readers did not necessarily have more strategies than less skilled readers. They seemed to have the same range of strategies but able English users tended to apply strategies more frequently than less able English users did. Also, the results revealed that both able English users and less able English users used metacognitive reading strategies most frequently, followed by cognitive and compensating reading strategies. The researcher explained that the development of the metacognitive reading strategies might have the greatest impact on the development of second-language reading skills.

Boonkongsaen, Sujinpram, and Verapreyagoon (2016) conducted a study of strategies in reading used by 280 Thai science students studying at public educational institutions and 269 Thai science students studying at private educational institutions. This study was proposed to investigate the frequency of strategies used by students and the differences of the use of strategies among the students' types of institutions and their relative exposure to English. The researchers focused on the use of global reading strategies, problem-solving strategies, and support reading strategies. The instrument used in the study was a Thai questionnaire translated from the SORS. The results of the study revealed that all of the science students moderately used strategies in overall use and in the three categories. The results also showed that students studying at public educational institutions used strategies significantly more than those in private educational institutions in overall use, in global reading strategies, and problem-solving Strategies. The researchers explained that compared to Thai students studying at private educational institutions, Thai students studying at public

educational institutions might be more proficient learners according to Thai context. Therefore, those studying at public educational institutions tended to use strategies more frequently because there was positive correlation between the use of strategies to learn and learning proficiency. Also, the results revealed that problem-solving strategies were used by the participants most frequently, followed by support reading strategies and global reading strategies. The researchers explained that EFL learners might often encounter reading problems. Therefore, they had to employ various problem-solving strategies to deal with texts written in a second language.

Petchinalert and Aksornjarung (2017) conducted a case study of the use of strategies in reading English and the relationship between the use of strategies and English proficiency. The researcher proposed investigating and comparing strategies used by Thai EFL teachers with different English academic reading proficiency levels. The researcher focused on the use of global reading strategies, problem-solving strategies, and support reading strategies. The participants of the study were 50 Thai EFL teachers. They were classified to be subjects with high and low reading proficiency based on their English reading test scores. The instruments used in the study were a questionnaire dealing with the use of reading strategies and the think-aloud protocols. The results of the study revealed that the Thai EFL teachers with high and low English academic reading proficiency significantly differed in their use of strategies. The Thai EFL teachers with high English academic reading proficiency outperformed the Thai EFL teachers with low English academic reading proficiency in their overall use of global reading strategies, problem-solving strategies, and support reading strategies. The results also revealed that the overall strategies used by the Thai EFL teachers and their English academic reading proficiency were

moderately and positively correlated. These findings supported the fact that the high-proficiency readers implemented strategies more frequently than those with low reading proficiency.

The relevant studies also demonstrate that studies of strategies in reading focus on the use of strategies and the relationship between the use of strategies and reading ability. Therefore, the researcher aimed to study the relationship between strategies and reading ability. According to Sheorey and Mokhtari (2001), both native and non-native readers who have high reading ability use strategies more than readers who have low reading ability. Because the relationship between reading ability and use of strategies is positive, the use of strategies in reading English safety materials would also have a positive correlation to the work experience of Thai civil engineers, because the longer Thai civil engineers work, the more they would have opportunities to deal with English materials and develop their reading skill. Based on this rationale and the findings of the previous studies, the researcher hypothesized that Thai civil engineers having longer work experience used more strategies in reading English safety materials than those having less work experience.

In summary, the previous studies on strategies in reading show that good readers use strategies more frequently than poor readers (Jarijitpaibul, 2002; Ingkakul, 2010; Oranpattanachai, 2010; Yeamtui, 2015; Petchinalert & Aksornjarung, 2017). However, most of the previous studies are in the context of academic reading. Therefore, the researcher conducted the study of the use of strategies in the context of engineering professionals to fill the gap. The researcher used Mokhtari and Sheorey's SORS which has been used frequently for research as the research instrument of this study. The researcher conducted correlation analysis to study the relationship

between the use of strategies of Thai civil engineers in reading English safety materials and their work experience. The researcher hypothesized that Thai civil engineers having longer work experience used more strategies in reading English safety materials than those having less work experience. Thai civil engineers' strategies in reading English safety materials presented in relation to the relationship between work experience and the strategies used are statistically tested in chapter 3.

CHARPTER 3

METHODOLOGY

Research Participants

     Population

        The population of this study was 62,772 Thai civil engineers holding professional licenses according to the record from the Council of Engineers in 2018.

     Sample

        The researcher used the Taro Yamane's formula (Yamane, 1973) to calculate the number of the sample by choosing the 95% confidence level and using the 5% margin of error. The formula determined the sample size of 400 Thai civil engineers.

Research Instrument

        The data for this study were collected through the questionnaire named Survey of Reading Strategies (SORS). This questionnaire was developed by Mokhtari and Reichard (2002). The purpose of development of the SORS was to measure the use of metacognitive reading strategies of readers. The researcher selected this questionnaire because the purpose of the study of Mokhtari and Sheorey was similar to the researcher's purpose. SORS's internal consistency reliability coefficients determined by Cronbach's alpha (Cronbach, 1951) for its overall scale is 0.93. The SORS was designed by using check lists, 5-point Likert scale (Likert, 1932). It was translated into Thai by Boonkongsaen, Sujinpram, and Verapreyagoon (2016). The researcher decided to distribute the Thai version of the questionnaire to

the participants because the questionnaire written in Thai is easier for participants to understand and answer. The researcher also added an open-ended question to the questionnaire in order to collect strategies which participants would use apart from the strategies mentioned in the questionnaire.

The questionnaire consisted of two parts as follows:

Part I : Demography of the participants

The questions in this part consisted of five questions regarding general information about the participants concerning years of experience, job position and educational background. The researcher interpreted the level of work experience based on the civil engineering work experience of the researcher as follows:

1 - 5 years	=	Low work experience
More than 5 years	=	High work experience

Part II : Strategies in reading safety materials

The questions in this part investigated how the participants chose strategies in reading English safety materials. They consisted of 30 frequency survey questions and 1 open-ended question. According to Best and Kahn (1993), the questions were scored as follows:

5 points	=	Always or Almost Always
4 points	=	Usually
3 points	=	Sometimes
2 points	=	Occasionally
1 point	=	Never or Almost Never

According to Mokhtari and Sheorey (2002), the interpretation for the frequency the participants rated their use of strategies to read was given as follows:

3.50 - 5.00	=	High use
2.50 - 3.40	=	Moderate use
1.00 - 2.40	=	Low use

Data collection

The researcher checked construction companies in Thailand which used English safety materials and distributed 400 copies of Thai version of questionnaires to Thai civil engineers working for companies selected and collected the answered questionnaires after the respondents had completed them. The researcher distributed the copies of the questionnaires from October 2017 to April 2018. 53 copies out of 400 were responded to.

The processes in this study were conducted as follows:

1. The questionnaires were distributed to the participants.

2. All questionnaires responded to by the participants were collected.

3. The data from the questionnaires was analyzed by using the SPSS program.

Data analysis

The data obtained from the completed questionnaires were analyzed by the Statistic

Package for Social Science (SPSS) software and presented as descriptive statistics. The percentage, mean and standard deviation of the data were presented in

tables. Also, Pearson product-moment correlation (Pearson's r) was used to perform bivariate correlation analysis of this study at the level of significance (α) of 0.05 in order to consider correlation between work experience of Thai civil engineers and the strategies they used. According to Hinkle, Wiersma, and Jurs (1998), the size of the correlation coefficient was interpreted as in Table 1.

Table 1 Rule of thumb for interpreting the size of a correlation coefficient

Size of Correlation	Interpretation
0.90 to 1.00 (-0.90 to -1.00)	Very high correlation
0.70 to 0.90 (-0.70 to -0.90)	High correlation
0.50 to 0.70 (-0.50 to -0.70)	Moderate correlation
0.30 to 0.50 (-0.30 to -0.50)	Low correlation
0.00 to 0.30 (0.00 to -0.30)	Little if any correlation

Source: Hinkle et al, 1998, p.120

The findings were presented in correspondence to the research questions in Chapter 4. The conclusion and discussion were presented in Chapter 5.

CHARPTER 4

FINDINGS

Findings of the study

Table 2 showed the demographic data of the participants who were 53 Thai civil engineers. The minimum year of experience of the participants was 1 year while the maximum years of experience were 18 years. 18 participants (34%) had low work experience while 35 participants (66%) had high work experience. 32 participants (60%) graduated a bachelor while 21 participants (40%) graduated a higher degree than a bachelor.

Table 2 The demographic data of the participants (n = 53)

Years of experience	Bachelor	Higher than Bachelor	No. of participants	Percentage of Participant
1-5	17	1	18	34%
6-10	9	14	23	43%
11-15	5	5	10	19%
16-20	1	1	2	4%
Total	32	21	53	100%

Table 3 showed the use of strategies of the participants. It demonstrated the means and standard deviations for each SORS item. The value of the means referred to the level of use which ranged from 1 (never) to 5 (always). Apart from the mean frequency score, the standard deviation for each individual strategy was also shown in Table 3. The strategy items were listed from high to low according to their mean scores in order to compare the levels of use of the strategy items.

Table 3 Means and Standard Deviations for Each SORS item used (n = 53)

Statement	Mean	S.D.	Level of Use
4. I take an overall view of the text to see what it is about before reading it.	4.21	0.793	High
3. I think about what I know to help me understand what I read.	3.98	0.665	High
14. When text becomes difficult, I pay closer attention to what I am reading.	3.98	0.772	High
25. When text becomes difficult, I re-read it to increase my understanding.	3.98	0.843	High
20. I use typographical features like bold face and italics to identify key information.	3.96	0.854	High
1. I have a purpose in mind when I read.	3.94	0.745	High
10. I underline or circle information in the text to help me remember it.	3.92	0.917	High
15. I use tables, figures, and pictures in text to increase my understanding.	3.89	1.103	High
9. I try to get back on track when I lose concentration.	3.85	0.988	High
23. I check my understanding when I come across new information.	3.85	0.718	High
11. I adjust my reading speed according to what I am reading.	3.83	0.778	High

Table 3 (continued)

Statement	Mean	S.D.	Level of Use
12. When reading, I decide what to read closely and what to ignore.	3.83	0.871	High
17. I use context clues to help me better understand what I am reading.	3.83	0.849	High
22. I go back and forth in the text to find relationships among ideas in it.	3.83	0.826	High
6. I think about whether the content of the text fits my reading purpose.	3.81	0.833	High
21. I critically analyze and evaluate the information presented in the text.	3.79	0.793	High
28. When I read, I guess the meaning of unknown words or phrases.	3.77	0.869	High
24. I try to guess what the content of the text is about when I read.	3.75	0.830	High
16. I stop from time to time and think about what I am reading.	3.66	0.939	High
18. I paraphrase (restate ideas in my own words) to better understand what I read.	3.63	1.023	High
19. I try to picture or visualize information to help remember what I read.	3.62	0.965	High

Table 3 (continued)

Statement	Mean	S.D.	Level of Use
7. I read slowly and carefully to make sure I understand what I am reading.	3.58	0.842	High
13. I use reference materials (e.g. a dictionary) to help me understand what I read.	3.57	0.910	High
27. I check to see if my guesses about the text are right or wrong.	3.47	0.890	Moderate
26. I ask myself questions I like to have answered in the text.	3.40	0.927	Moderate
29. When reading, I translate from English into my native language.	3.32	0.996	Moderate
5. When text becomes difficult, I read aloud to help me understand what I read.	3.30	1.119	Moderate
2. I take notes while reading to help me understand what I read.	3.19	1.241	Moderate
30. When reading, I think about information in both English and my mother tongue.	3.15	0.969	Moderate
8. I review the text first by noting its characteristics like length and organization.	3.09	0.946	Moderate

As shown in Table 3, 53 surveyed Thai civil engineers who reported using each reading strategy statement on the SORS with unvarying levels of use. Table 3 showed that 22 out of 30 statements reported being used at the high level, 8 out of 30

statements being used at the moderate level and none of 30 statements being used at

the low level respectively. The means of individual statements ranged from a high of

4.21 with a standard deviation of 0.793 to a low of 3.09 with a standard deviation of

0.946. The most frequently reported statement was statement no.4 (Mean = 4.21, S.D.

= 0.793). This statement was followed by statement no.3 (Mean = 3.98, S.D. =

0.665), statement no.14 (Mean = 3.98, S.D. = 0.772), statement no.25 (Mean = 3.98,

S.D. = 0.843), and statement no.20 (Mean = 3.96, S.D. = 0.854). The strategy with

the lowest mean was statement no.8 (Mean = 3.09, S.D. = 0.946). This statement was

followed by statement no.30 (Mean = 3.15, S.D. = 0.969), statement no.2 (Mean =

3.19, S.D. = 1.241), statement no.5 (Mean = 3.30, S.D. = 1.119), and statement no.9

(Mean = 3.32, S.D. = 0.996).

Table 4 showed the reported strategies under three main sub-categories of

metacognitive reading strategies classified by Mokhtari and Sheorey (2002). This

table presented the strategies under the categories of global reading strategies, support

reading strategies and problem-solving strategies.

Table 4 Reported Use of Strategies in the three categories (n = 53)

Strategy	Mean	S.D.
Global Reading Strategies		
4. I take an overall view of the text to see what it is about before reading it.	4.21	0.793

Table 4 (continued)

Strategy	Mean	S.D.
Global Reading Strategies		
3. I think about what I know to help me understand what I read.	3.98	0.665
20. I use typographical features like bold face and italics to identify key information.	3.96	0.854
1. I have a purpose in mind when I read.	3.94	0.745
15. I use tables, figures, and pictures in text to increase my understanding.	3.89	1.103
23. I check my understanding when I come across new information.	3.85	0.718
12. When reading, I decide what to read closely and what to ignore.	3.83	0.871
17. I use context clues to help me better understand what I am reading.	3.83	0.849
6. I think about whether the content of the text fits my reading purpose.	3.81	0.833
21. I critically analyze and evaluate the information presented in the text.	3.79	0.793
24. I try to guess what the content of the text is about when I read.	3.75	0.830
27. I check to see if my guesses about the text are right or wrong.	3.47	0.890
8. I review the text first by noting its characteristics like length and organization.	3.09	0.946

Table 4 (continued)

Strategy	Mean	S.D.
Global Reading Strategies		
Total	**3.80**	**0.481**
Support Reading Strategies		
10. I underline or circle information in the text to help me remember it.	3.92	0.917
22. I go back and forth in the text to find relationships among ideas in it.	3.83	0.826
18. I paraphrase (restate ideas in my own words) to better understand what I read.	3.63	1.023
13. I use reference materials (e.g. a dictionary) to help me understand what I read.	3.57	0.910
26. I ask myself questions I like to have answered in the text.	3.40	0.927
29. When reading, I translate from English into my native language.	3.32	0.996
5. When text becomes difficult, I read aloud to help me understand what I read.	3.30	1.119
2. I take notes while reading to help me understand what I read.	3.19	1.241
30. When reading, I think about information in both English and my mother tongue.	3.15	0.969
Total	**3.48**	**0.600**

Table 4 (continued)

Strategy	Mean	S.D.
Problem-Solving Strategies		
14. When text becomes difficult, I pay closer attention to what I am reading.	3.98	0.772
25. When text becomes difficult, I re-read it to increase my understanding.	3.98	0.843
9. I try to get back on track when I lose concentration.	3.85	0.988
11. I adjust my reading speed according to what I am reading.	3.83	0.778
28. When I read, I guess the meaning of unknown words or phrases.	3.77	0.869
16. I stop from time to time and think about what I am reading.	3.66	0.939
19. I try to picture or visualize information to help remember what I read.	3.62	0.95
7. I read slowly and carefully to make sure I understand what I am reading.	3.58	0.842
Total	**3.79**	**0.572**

As demonstrated in the table above, the means of individual statements in the category of global reading strategy ranged from a high of 4.21 with a standard deviation of 0.793 to a low of 3.09 with a standard deviation of 0.946. The most frequently reported statement in the category of global reading strategy was statement no.4 (Mean = 4.21, S.D. = 0.793). The statement in the category of global reading strategy with the lowest mean was statement no.8 (Mean = 3.09, S.D. = 0.946). The

means of statements in the category of support reading strategy ranged from a high of

3.92 with a standard deviation of 0.917 to a low of 3.15 with a standard deviation of

0.969. The most frequently reported statement in the category of support reading

strategy was statement no.10 (Mean = 3.92, S.D. = 0.917). The statement in the

category of support reading strategy with the lowest mean was statement no.30 (Mean

= 3.15, S.D. = 0.969). The means of statements in the category of problem-solving

reading strategy ranged from a high of 3.98 with a standard deviation of 0.772 to a

low of 3.58 with a standard deviation of 0.842. The most frequently reported

statement in the category of problem-solving strategy was statement no.14 (Mean =

3.98, S.D. = 0.772). The statement in the category of problem-solving strategy with

the lowest mean was item statement no.7 (Mean = 3.58, S.D. = 0.842).

Table 5 showed the level of Thai civil engineers' overall strategy use and the

level of the use of overall strategies by the 3 main categories.

Table 5 Reported Use of Overall, Global, Problem-Solving and Support Reading

Strategies

Strategy Use	Mean	S.D.	Level of Use
Overall Use	3.70	0.463	High
Global Reading Strategies	3.80	0.481	High
Support Strategies	3.48	0.600	Moderate
Problem-Solving Strategies.	3.79	0.572	High

The participants reported high use with the mean score of 3.70 and the standard deviation of 0.463. Regarding the category level, global reading strategies were reported high use with the mean score of 3.80 and the standard deviation of 0.481; support strategies were reported moderate use with the mean score of 3.48 and the standard deviation of 0.600; and problem-solving strategies were reported high use with the mean score of 3.79 and the standard deviation of 0.572. The participants reported that they used global reading strategies the most, problem-solving strategies the second most and support strategies the least.

Table 6 showed the other strategies in reading English safety materials used by Thai civil engineers apart from the strategies mentioned in the SORS. They were collected by using the open-ended question in the questionnaire.

Table 6 Other strategies in reading used

Reading Strategy
I re-read several times.
I have a conversation in the contents I read with friends.
I ask a guru.
I make a note of vocabularies in what I read and try to think of them.
I read other texts related to the text I focus to help me understand what I focus to read.

Table 7 showed the correlation of each reading strategy to work experience explored by using Pearson's r. This table showed the individual correlation coefficients of each reading strategy to work experience.

Table 7 Correlations of each SORS item with years of work

Strategy	Pearson's r	Sig. (2-tailed)
1. I have a purpose in mind when I read.	0.012	0.932
2. I take notes while reading to help me understand what I read.	-0.001	0.995
3. I think about what I know to help me understand what I read.	0.019	0.894
4. I take an overall view of the text to see what it is about before reading it.	-0.251	0.070
5. When text becomes difficult, I read aloud to help me understand what I read.	-0.047	0.741
6. I think about whether the content of the text fits my reading purpose.	0.053	0.708
7. I read slowly and carefully to make sure I understand what I am reading.	0.072	0.610
8. I review the text first by noting its characteristics like length and organization.	0.009	0.946
9. I try to get back on track when I lose concentration.	-0.207	0.137
10. I underline or circle information in the text to help me remember it.	0.080	0.567

Table 7 (continued)

Strategy	Pearson's r	Sig. (2-tailed)
11. I adjust my reading speed according to what I am reading.	-0.284*	0.040
12. When reading, I decide what to read closely and what to ignore.	-0.177	0.205
13. I use reference materials (e.g. a dictionary) to help me understand what I read.	0.211	0.130
14. When text becomes difficult, I pay closer attention to what I am reading.	-0.052	0.714
15. I use tables, figures, and pictures in text to increase my understanding.	0.089	0.525
16. I stop from time to time and think about what I am reading.	-0.060	0.671
17. I use context clues to help me better understand what I am reading.	0.255	0.065
18. I paraphrase (restate ideas in my own words) to better understand what I read.	-0.161	0.251
19. I try to picture or visualize information to help remember what I read.	-0.234	0.091
20. I use typographical features like bold face and italics to identify key information.	0.001	0.992

Table 7 (continued)

	Strategy	Pearson's r	Sig. (2-tailed)
21.	I critically analyze and evaluate the information presented in the text.	-0.013	0.927
22.	I go back and forth in the text to find relationships among ideas in it.	-0.014	0.922
23.	I check my understanding when I come across new information.	0.006	0.963
24.	I try to guess what the content of the text is about when I read.	-0.206	0.139
25.	When text becomes difficult, I re-read it to increase my understanding.	-0.262	0.059
26.	I ask myself questions I like to have answered in the text.	0.025	0.857
27.	I check to see if my guesses about the text are right or wrong.	0.002	0.987
28.	When I read, I guess the meaning of unknown words or phrases.	-0.189	0.176
29.	When reading, I translate from English into my native language.	-0.132	0.347
30.	When reading, I think about information in both English and my mother tongue.	-0.093	0.507

$*p < .05$

Table 7 showed that only the use of statement no.11 had correlation with work experience at the 95% confidence level because the level of signification of correlation between the use of this strategy and work experience (p-value = 0.040) was less than the margin of error (α = 0.05). The use of the other strategies did not have significant correlation with work experience because the level of signification of correlation between the use of the other strategies and work experience were more than the margin of error (p-value > .05). A significant negative correlation at a very low level was found between the use of statement no.11 (r = -.284, p < .05). That is, the Thai civil engineers who have longer work experience are likely to use slightly fewer strategies than other Thai civil engineers having less work experience do.

CHARPTER 5

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND LIMITATION

Discussion

The discussion is divided into two main sections. These sections deal with the use of strategies by Thai civil engineers in reading English safety materials, and with the relationship between Thai civil engineers' work experience and their use of strategies.

The use of strategies in reading English safety materials of Thai civil engineers

Firstly, the participants of this study reported the overall use of strategies at a high level (Mean = 3.70, S.D. = 0.463). The explanation could be the frequency of their out-of-classroom reading. According to Chen and Intaraprasert (2014), learners who reported a higher frequency of the use of strategies also reported a higher frequency of out-of-classroom reading. It could be inferred that the more they read, the more they could employ strategies. Engineering students frequently need to read text written in English after class and engineering professionals frequently do likewise while working because most of engineering reference materials are written in English. By reading a high number of English safety materials, Thai civil engineers would be more experienced in reading technical English and more skillful in employing strategies to enhance their reading comprehension (Chen & Intaraprasert, 2014). Moreover, although the previous studies mentioned in Chapter 1 demonstrate that Thai engineers probably are weak in English, the results of this study showed that Thai engineers who participated were good in English, especially in reading English

because they reported the overall use of strategies at a high level. According to the studies of Chen and Intaraprasert, 2014; Nisbet and Huang, 2015; Dawadi, 2017; Rastegar, Mehrabi Kermani, and Khabir, 2017; Tanthanis, 2016, EFL learners at a higher level of reading proficiency reported a significantly higher frequency of the use of strategies. These studies found a significantly positive relationship between the use of strategies and reading comprehension achievement. This can explain the result of the study that the participants were good in English because they reported the overall use of strategies at a high level.

Secondly, the strategies in the category of global reading strategies were the strategies participants used most frequently. The strategies in the category of problem-solving strategies were used second most frequently. The strategies in the category of support reading strategies were the least used strategies. According to Mokhtari and Reichard (2002), readers use global reading strategies to help them work with text directly or to manage and monitor their reading whereas they use support reading strategies to aid reading comprehension by note-taking, underlining and highlighting. This can be explained by the participants preferring to work with text directly as opposed to using basic mechanisms intended to help their reading.

Thirdly, the most frequently reported strategy was the strategy *I take an overall view of the text to see what it is about before reading it*. This strategy was followed by the strategies *I think about what I know to help me understand what I read*; *When text becomes difficult, I pay closer attention to what I am reading*; *When text becomes difficult, I re-read it to increase my understanding* and *I use typographical features like bold face and italics to identify key information*. None of these strategies was in the category of support reading strategies. The explanation

might be engineers' opportunities for reading. While working on construction sites, professional engineers are assigned to supervise work individually. They have opportunity to work on-site with colleagues less often than to work on-site alone. As a consequence they frequently read materials alone. Therefore, they would employ global reading strategies and problem-solving strategies which can help them encounter reading problems by themselves. The finding also revealed that the participants did not especially use strategies relating to graphics, vocabulary, and short text which were the main components of safety materials. It can be assumed that strategies used for reading technical English that is used to write safety materials are not different from strategies used for reading general English.

Lastly, some of the participants reported the strategies apart from the metacognitive strategies in the SORS. These strategies were *I re-read several times*, *I have a conversation in the contents I read with friends*, *I ask a guru*, *I make a note of vocabularies in what I read and try to think of them*, and *I read other texts related to the text I focus to help me understand what I focus to read*. According to the classification of reading strategies of Oxford (2003), the strategy *I re-read several times* and *I read other texts related to the text I focus to help me understand what I focus to read* still involved metacognitive reading strategies. However, other strategies reported were not the metacognitive reading strategies. The strategy *I make a note of vocabularies in what I read and try to think of them* involved the cognitive strategies. The strategy *I ask a guru* involved the compensation strategies. The strategy *I have a conversation in the contents I read with friends* involved the social strategies. Therefore, the finding emphasized that Thai civil engineers used not only the metacognitive reading strategies but other strategies to solve problems of reading.

According to the findings on the use of strategies of Thai civil engineers in reading English safety materials mentioned, the significance of the study for designing a training course for reading English can be appreciated as follows:

Firstly, strategies in reading were argued to have a significant positive correlation with reading comprehension (Oxford & Ehrman, 1995). The research results of Sheorey and Mokhtari (2001) also revealed that ESL high-reading-ability readers have higher degrees of reading strategies usage than lower-reading ability readers. It can be assumed that high-proficiency readers tend to apply strategies more frequently than less proficient readers. Because the participants reported their use of metacognitive reading strategies at a high level, it could be inferred that they would be high reading -proficiency learners in English. Therefore, for them, training courses in reading English should focus on advanced techniques for reading.

Secondly, because Thai civil engineers used global reading strategies most frequently, training courses in reading English for Thai civil engineers should encourage them to increase the use of problem-solving strategies and support strategies.

Thirdly, because It can be assumed that strategies used for reading technical English are not different from strategies used for reading general English, training courses in the use of metacognitive reading strategies for reading technical English can be the same as training courses for reading general English.

Lastly, because Thai civil engineers reported the use of other strategies apart from metacognitive reading strategies, training courses for them should consist of the use of all six categories of reading strategies according to Oxford (2003).

The relationship between Thai civil engineers' work experience and their use of strategies

The finding of the study showed that the participants' use of most of the strategies did not have significant correlation with work experience. The interpretation here is that the experienced Thai civil engineers used strategies at the same level as the less experienced Thai civil engineers. This finding is not correspondent with the finding of Ingkakul (2010) who conducted a study of strategies used by Thai resident physicians and Thai medical students for reading academic materials. Ingkakul found that the average score of strategies used by the resident physicians was 3.64 while the average score of strategies used by the medical students was 3.23. Ingkakul concluded that the Thai resident physicians who were the more experienced readers tended to use a higher number of different strategies than the Thai medical students. The result of this study is not correspondent with the finding of Ingkakul because of the methodology. The researcher used the Pearson correlation coefficient (Pearson'r) for the analysis and did not find a significant correlation between the Thai civil engineers' work experience and their use of strategies while Ingkakul compared the average score of the Thai resident physicians and the Thai medical students in using strategies and found that the average score of the Thai resident physicians was higher than the scores of the Thai medical students. The study found that the Thai civil engineers used strategies at a high overall level. This is probably because Thai civil engineers use strategies at a high level from the time their careers begin. Although having high prior knowledge is crucial for achieving high performance in reading, readers who do not have high prior

knowledge are also capable of achieving high performances in reading if they are skillful in the language (Abdelaal & Sase, 2014).

According to a study of the use of strategies of Thai university engineering students conducted by Thampradit (2008), Thai university engineering students used overall strategies at a moderate level. Also, according to the case study conducted by Sillapee (2016), Thai civil engineers who have work experience of less than 10 years possess English skills. Based on this rationale, the use of strategies of Thai civil engineers who have longer work experience are not likely to differ from the use of strategies of Thai civil engineers having less work experience because Thai civil engineers would use strategies at a high level since they start working and continue to use strategies at a high level even after they have worked for years. This finding appreciates the significance of the study for designing a training course for reading English through which Thai civil engineers who have longer work experience and those having less work experience can take the same course in using metacognitive reading strategies in reading English materials.

Conclusions

This study aimed at investigating the use of strategies in reading English safety materials of 53 Thai civil engineers who had work experience from 1 to 18 years. The participants used all of the metacognitive strategies in the categories of global reading, support reading and problem-solving strategies. None of the strategies in these three categories were used at low level. The participants reported the use of global reading strategies and problem-solving strategies at high level; they reported the use of support strategies at moderate level, and they reported the use of strategies

overall at a high level. The findings also revealed the use of cognitive strategies, compensation strategies and social strategies in reading English safety materials. The result of the study showed that Thai civil engineers used a wide range of strategies but there was a preference for global reading strategies, followed by problem-solving strategies and support strategies. The results of this study also explained the relationship between Thai civil engineers' work experience and their use of strategies: that the use of strategies did not have a significant correlation with work experience. Thai civil engineers who had longer work experience were likely to use slightly fewer strategies than Thai civil engineers who had less work experience.

Ultimately, the results of this study provoke discussion on why the participants reported the use of strategies overall at a high level; why the strategies in the category of global reading strategies were the strategies participants used most frequently; and why the use of most of the strategies did not have significant correlation with work experience. Firstly, participants of this study reported the use of strategies overall at a high level because of the high frequency of their out-of-classroom reading. It could be inferred that the more they read, the more they could employ strategies. Secondly, the participants used global reading strategies most frequently because these strategies are similar to the nature of the work of Thai civil engineers. Thai civil engineers are mainly responsible for planning and managing works which have to be done, and monitoring workers in construction. Lastly, the use of most strategies did not have significant correlation with work experience. From this we could infer that Thai civil engineers use strategies at a high level since they have short work experience.

Consequently, the results of this study define the significance of the study for designing a training course for reading English. A training course for Thai civil engineers for reading technical English can be the same course as a training course for reading general English because the use of strategies in reading technical English used in safety materials focuses on neither graphics nor vocabulary. Also, the training course should encourage Thai civil engineers to increase the use of support strategies, because of the participants' reported use of these strategies at moderate level.

Recommendations for Further Research

Based on the findings and conclusions of this study, the following recommendations are made for future research on the field of engineering in English as a foreign language.

1. This study has limitations in the sense that participants are only Thai civil engineers. Nevertheless, other types of engineers – i.e. mechanical engineers – also have to read English safety materials while working. Further research is needed to see whether the same results would be gained from different samples. Further studies dealing with investigation and comparison of the use of strategies used by various types of engineers would help demonstrate the use of strategies of Thai engineers overall and verify the findings of this study.

2. The researcher distributed more than 400 hard copies of the questionnaire to the participants but only 53 copies were responded to during a six month period. The respondents represent only 0.08 per cent of Thai civil engineers. The size of the sample might be too small to effectively measure the significant interaction between Thai civil engineers who have short work experience and others

who have long work experience. Further study may involve distribution of an online questionnaire such as a Google form together with hard copies, in order to help participants respond more easily.

        3. This study focuses on the use of strategies in reading English safety materials. However, the main function of safety materials is limited to giving instruction. Further research is needed to see whether the same results would be gained from a different textual genre in the workplace engaged in reading lengthy texts.

Limitation of the research

        The results of this study were based on the SORS only. The use of self-report questionnaires has limitations, as the researcher cannot ascertain with absolute certainty from the instrument alone whether Thai civil engineers truly use the strategies they have reported. Furthermore, a qualitative research method such as in-depth interviews cannot be conducted due to the nature of the participants' work, and their frequent unavailability for interviews.

        In addition, this study might not be able to demonstrate the actual use in average of all Thai civil engineers. The participants of this study reported the use of strategies at a high level while most Thai civil engineers are likely to report the use of strategies at a low or medium level as reported in the previous studies mentioned in chapter 1.

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APPENDICES
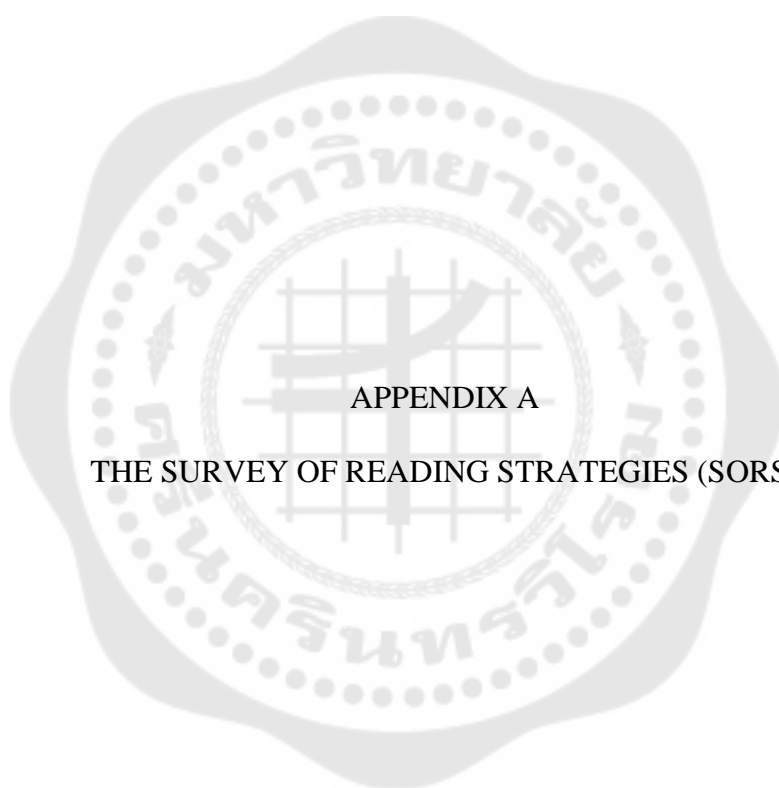
APPENDIX A

THE SURVEY OF READING STRATEGIES (SORS)

The Survey of Reading Strategies (SORS)

Measuring ESL Students' Awareness of Reading Strategies

By Kouider Mokhtari and Ravi Sheorey

Appendix
SURVEY OF READING STRATEGIES
(SORS)

The purpose of this survey is to collect information about the various techniques you use when you read **academic materials in English** (e.g., reading textbooks for homework or examinations, reading journal articles, etc.).

All the items below refer to your reading of **college-related academic** materials (**such as textbooks,** *not* newspapers or magazines). Each statement is followed by five numbers, 1, 2, 3, 4, and 5, and each number means the following:
  '1' means that 'I **never or almost never** do this'.
  '2' means that 'I do this **only occasionally**'.
  '3' means that 'I **sometimes** do this'. (About **50%** of the time.)
  '4' means that 'I **usually** do this'.
  '5' means that 'I **always or almost always** do this'.
After reading each statement, *circle the number* (1, 2, 3, 4, or 5) which applies to you. Note that there are **no right or wrong responses** to any of the items on this survey.

Category		Statement	Never				Always
GLOB	1.	I have a purpose in mind when I read.	1	2	3	4	5
SUP	2.	I take notes while reading to help me understand what I read.	1	2	3	4	5
GLOB	3.	I think about what I know to help me understand what I read.	1	2	3	4	5
GLOB	4.	I take an overall view of the text to see what it is about before reading it.	1	2	3	4	5
SUP	5.	When text becomes difficult, I read aloud to help me understand what I read.	1	2	3	4	5
GLOB	6.	I think about whether the content of the text fits my reading purpose.	1	2	3	4	5
PROB	7.	I read slowly and carefully to make sure I understand what I am reading.	1	2	3	4	5
GLOB	8.	I review the text first by noting its characteristics like length and organization.	1	2	3	4	5
PROB	9.	I try to get back on track when I lose concentration.	1	2	3	4	5
SUP	10.	I underline or circle information in the text to help me remember it.	1	2	3	4	5
PROB	11.	I adjust my reading speed according to what I am reading.	1	2	3	4	5
GLOB	12.	When reading, I decide what to read closely and what to ignore.	1	2	3	4	5
SUP	13.	I use reference materials (e.g., a dictionary) to help me understand what I read.	1	2	3	4	5
PROB	14.	When text becomes difficult, I pay closer attention to what I am reading.	1	2	3	4	5
GLOB	15.	I use tables, figures, and pictures in text to increase my understanding.	1	2	3	4	5
PROB	16.	I stop from time to time and think about what I am reading.	1	2	3	4	5
GLOB	17.	I use context clues to help me better understand what I am reading.	1	2	3	4	5
SUP	18.	I paraphrase (restate ideas in my own words) to better understand what I read.	1	2	3	4	5
PROB	19.	I try to picture or visualize information to help remember what I read.	1	2	3	4	5
GLOB	20.	I use typographical features like bold face and italics to identify key information.	1	2	3	4	5
GLOB	21.	I critically analyze and evaluate the information presented in the text.	1	2	3	4	5
SUP	22.	I go back and forth in the text to find relationships among ideas in it.	1	2	3	4	5
GLOB	23.	I check my understanding when I come across new information.	1	2	3	4	5
GLOB	24.	I try to guess what the content of the text is about when I read.	1	2	3	4	5
PROB	25.	When text becomes difficult, I re-read it to increase my understanding.	1	2	3	4	5
SUP	26.	I ask myself questions I like to have answered in the text.	1	2	3	4	5
GLOB	27.	I check to see if my guesses about the text are right or wrong.	1	2	3	4	5
PROB	28.	When I read, I guess the meaning of unknown words or phrases.	1	2	3	4	5
SUP	29.	When reading, I translate from English into my native language.	1	2	3	4	5
SUP	30.	When reading, I think about information in both English and my mother tongue.	1	2	3	4	5

APPENDIX B

QUESTIONNAIRE

Questionnaire

Part I : Demographic data

Instructions: Please fill in the blanks and tick in a ☐ for your response.

1. Years of working experience: …… years

2. Current position: …………………

3. Educational background

☐ Vocational Certificate   ☐ High Vocational Certificate☐ Bachelor degree

☐ Higher than bachelor degree   ☐ Other …………………

4. Field of study: …………………

5. The program of degree

☐ Thai program   ☐ English program

Part II: Reading strategies English safety materials

Instructions: Please fill in the blanks and rate the frequency you use the following strategies by ticking in the appropriate space.

"5" means 'I always or almost always do this'.

"4" means 'I usually do this'.

"3" means 'I sometimes do this' (About 50% of the time).

"2" means that 'I do this only occasionally'.

"1" means that 'I never or almost never do this'.

Item	Statements	Frequency				
		5	4	3	2	1
1	I have a purpose in mind when I read.					
2	I take notes while reading to help me understand what I read.					
3	I think about what I know to help me understand what I read.					
4	I take an overall view of the text to see what it is about before reading it.					
5	When text becomes difficult, I read aloud to help me understand what I read.					
6	I think about whether the content of the text fits my reading purpose.					
7	I read slowly and carefully to make sure I understand what I am reading.					
8	I review the text first by noting its characteristics like length and organization.					
9	I try to get back on track when I lose concentration.					
10	I underline or circle information in the text to help me remember it.					
11	I adjust my reading speed according to what I am reading.					
12	When reading, I decide what to read closely and what to ignore.					
13	I use reference materials (e.g. a dictionary) to help me understand what I read.					

Item	Statements	Frequency				
		5	4	3	2	1
14	When text becomes difficult, I pay closer attention to what I am reading.					
15	I use tables, figures, and pictures in text to increase my understanding.					
16	I stop from time to time and think about what I am reading.					
17	I use context clues to help me better understand what I am reading.					
18	I paraphrase (restate ideas in my own words) to better understand what I read.					
19	I try to picture or visualize information to help remember what I read.					
20	I use typographical features like bold face and italics to identify key information.					
21	I critically analyze and evaluate the information presented in the text.					
22	I go back and forth in the text to find relationships among ideas in it.					
23	I check my understanding when I come across new information.					
24	I try to guess what the content of the text is about when I read.					
25	When text becomes difficult, I re-read it to increase my understanding.					

Item	Statements	Frequency				
		5	4	3	2	1
26	I ask myself questions I like to have answered in the text.					
27	I check to see if my guesses about the text are right or wrong.					
28	When I read, I guess the meaning of unknown words or phrases.					
29	When reading, I translate from English into my native language.					
30	When reading, I think about information in both English and my mother tongue.					
31	Other strategies: Apart from the strategies mentioned above, my reading strategies English safety materials are …………………………………………………………………………….……… …………………………………………………………………………….………					

Questionnaire (Thai version)

ตอนที่ 1 : ข้อมูลส่วนตัว

วิธี : โปรดตอบคำถามลงในช่องว่างและกาเครื่องหมายถูกลงในช่อง ☐ ที่ตรงกับข้อมูลของท่าน

1. ระยะเวลาในการทำงาน: ...... ปี

2. ตำแหน่งงานปัจจุบัน: ....

3. ประวัติการศึกษา

สำเร็จการศึกษาในระดับ

☐ ปวช.   ☐ ปวส.   ☐ ปริญญาตรี

☐ สูงกว่าปริญญาตรี   ☐ อื่นๆ ....

4. สาขาการศึกษา: ....

5. ประเภทของหลักสูตร

☐ หลักสูตรภาษาไทย ☐ หลักสูตรนานาชาติ

ตอนที่ 2 : กลวิธีอ่านสื่อความปลอดภัยภาษาอังกฤษ

วิธี : โปรดระบุความถี่ในการใช้กลวิธีดังต่อไปนี้ โดยกาเครื่องหมายถูกลงในช่องที่ตรงกับความคิดเห็นของท่าน

"5" หมายถึง ใช้กลวิธีการอ่านดังกล่าวเป็นประจำหรือเกือบเป็นประจำ

"4" หมายถึง ใช้กลวิธีการอ่านดังกล่าวบ่อยครั้ง

"3" หมายถึง ใช้กลวิธีการอ่านดังกล่าวเป็นบางครั้ง (ประมาณครึ่งหนึ่งของการอ่าน)

"2" หมายถึง ใช้กลวิธีการอ่านดังกล่าวน้อยครั้ง

"1" หมายถึง ไม่ใช้กลวิธีการอ่านดังกล่าวเลยหรือเกือบไม่ใช้เลย

ข้อที่	กลวิธี	ความถี่				
		5	4	3	2	1
1	ข้าพเจ้ามีจุดมุ่งหมายในใจในการอ่าน					
2	ข้าพเจ้าจดบันทึกเนื้อหาในขณะอ่านเพื่อช่วยให้เข้าใจเนื้อหาที่อ่าน					
3	ข้าพเจ้านึกถึงสิ่งที่รู้เพื่อช่วยให้เข้าใจเนื้อหาที่อ่าน					
4	ก่อนอ่าน ข้าพเจ้าจะมองเนื้อหาคร่าวๆ เพื่อให้ทราบว่าเนื้อหาที่อ่านเกี่ยวข้องกับอะไร					
5	เมื่ออ่านเนื้อหาที่ยาก ข้าพเจ้าจะใช้การอ่านออกเสียงเพื่อช่วยให้เข้าใจ					
6	ข้าพเจ้าคิดว่าเนื้อหาที่อ่านตรงกับจุดมุ่งหมายการอ่านของข้าพเจ้าหรือไม่					
7	ข้าพเจ้าอ่านอย่างช้าๆและรอบคอบเพื่อให้มั่นใจว่าเข้าใจเนื้อหาที่อ่าน					
8	ข้าพเจ้าจะอ่านทบทวนเนื้อหาโดยจดบันทึกลักษณะต่างๆ ของเนื้อหาที่อ่าน เช่น ความยาวของเนื้อหา และการเรียบเรียงเนื้อหา					

ข้อที่	กลวิธี	ความถี่				
		5	4	3	2	1
9	ข้าพเจ้าย้อนกลับมาอ่านเนื้อหาเมื่อขาดสมาธิในการอ่าน					
10	ข้าพเจ้าขีดเส้นใต้หรือวงกลมข้อความในเนื้อหาเพื่อช่วยจดจำเนื้อหา					
11	ข้าพเจ้าปรับระดับความเร็วในการอ่านให้เหมาะกับเนื้อหาที่อ่าน					
12	ขณะอ่าน ข้าพเจ้าตัดสินใจว่าข้อความใดควรอ่านอย่างรอบคอบหรือข้าม					
13	ข้าพเจ้าใช้เอกสารอ้างอิงเช่น พจนานุกรม เพื่อช่วยให้เข้าใจเนื้อหา					
14	เมื่อเจอเนื้อหาที่ยาก ข้าพเจ้าจะอ่านอย่างพิจารณามากขึ้น					
15	ข้าพเจ้าใช้ตาราง รูป ภาพต่างๆ ในเนื้อหา เพื่อประกอบความเข้าใจในเนื้อหา					
16	ข้าพเจ้าหยุดอ่านเป็นระยะเพื่อคิดเกี่ยวกับเนื้อหาที่อ่าน					
17	ข้าพเจ้าใช้บริบทของข้อความเพื่อช่วยเข้าใจเนื้อหา					
18	ข้าพเจ้าสรุปเนื้อหาที่อ่านเป็นคำพูดของตนเองเพื่อให้เข้าใจเนื้อหาที่อ่านยิ่งขึ้น					
19	ข้าพเจ้าคิดเนื้อหาที่อ่านเป็นภาพเพื่อช่วยจดจำเนื้อหา					
20	ข้าพเจ้าสังเกตตัวอักษรเช่น ตัวทึบ ตัวเอียง เพื่อบอกข้อมูลสำคัญของเรื่อง					
21	ข้าพเจ้าวิเคราะห์และประเมินเนื้อหาที่อ่าน					
22	ข้าพเจ้าอ่านเนื้อหากลับไปมาเพื่อหาความสัมพันธ์ของประเด็นเนื้อหาที่อ่าน					
23	ข้าพเจ้าตรวจสอบความเข้าใจของตนเองเมื่ออ่านเจอเนื้อหาที่ไม่เคยอ่านมาก่อน					
24	ข้าพเจ้าพยายามคาดเดาเนื้อหาที่อ่านว่าเกี่ยวกับอะไร					
25	เมื่ออ่านเจอข้อความยาก ข้าพเจ้าจะอ่านซ้ำเพื่อให้เข้าใจมากขึ้น					
26	ข้าพเจ้าตั้งคำถามและหาคำตอบด้วยตนเองจากเรื่องที่อ่าน					
27	ข้าพเจ้าตรวจสอบว่าการคาดเดาเนื้อหาที่อ่านถูกต้องหรือไม่					
28	ข้าพเจ้าคาดเดาความหมายคำศัพท์หรือวลีที่ไม่ทราบในขณะอ่าน					
29	ข้าพเจ้าแปลข้อความจากภาษาอังกฤษเป็นภาษาไทยขณะอ่าน					
30	ข้าพเจ้านึกถึงเรื่องที่กำลังอ่านเป็นทั้งภาษาอังกฤษและภาษาไทย					
31	กลวิธีอื่นๆ: กลวิธีอ่านสื่อความปลอดภัยภาษาอังกฤษของข้าพเจ้านอกเหนือจากที่ได้กล่าวมาแล้ว คือ					

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