

THE REACTIVITY EFFECT OF THINK ALOUD PROTOCOL ON
VOCABULARY DEVELOPMENT IN READING COMPREHENSION
AMONG ENGLISH AS FOREIGN LANGUAGE LEARNERS

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To my beloved husband:

Sameer Owaid Al-Rawi

To the two candles in my life:

Sama Al-Rawi and Hamzah Al-Rawi

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ABSTRACT

The issue of reactivity in concurrent verbal reports has motivated many recent investigations to examine the effect of think-aloud during task completion. The role of verbalisation in foreign language learning is still an open question, especially in terms of variables on vocabulary development. The current study investigated the issue of reactivity on vocabulary development while students engaged in reading comprehension task. Most specifically, this study sought to address the potential methodological issue of reactivity affecting learner's attention on the process of form or process of lexical form, and processing of meaning in different attentional conditions of task-induced involvement. In order to successfully explore such a broad issue, mixed methods approaches were adopted to discover the different aspects of reactivity from different angles and provide a better understanding of how performing think-aloud would trigger the issue of reactivity in experimental intervention. The quasi-experimental research design was employed to investigate the cause-and-effect inferences of participants' attention to word form and meaning while engaged in performing reading comprehension task. A total of 27 intermediate English as Foreign Language students were selected as sample in this study. Participants were assigned randomly into three groups to perform several tasks based on the involvement of load hypothesis. Two qualitative and three quantitative instruments (think-aloud, journal entry writing, reading comprehension test, written vocabulary production test, and recognition pre-test and post-test of word meaning) were employed to investigate the issue of reactivity. Results obtained from the think-aloud protocol and journal entry writing revealed a positive effect of think-aloud to trigger the potential issue of reactivity on vocabulary development through operationalizing level of awareness and depth of processing that use to assist in the investigation of reactivity. Positive reactive effect of think-aloud occurred in all types of reading comprehension tasks, especially in multiple-choice glosses used to identify the main idea. Results of this study provide evidence of the relationship between level of awareness and level of processing with development. Overall, the study supported the beneficial effect of glossing on memory experiences and vocabulary development. In conclusion, the input-output of task-induced involvement leads students to engage in deep processing with a higher level of awareness and the process of reactivity may trigger vocabulary development and enhance students' performance in reading comprehension.

ABSTRAK

Isu kereaktifan dalam laporan lisan serentak telah mendorong pelbagai penyelidikan untuk mengkaji kesan berfikir secara sedar semasa menyelesaikan tugas. Peranan pengucapan secara sedar dalam pembelajaran Bahasa Asing masih lagi merupakan soalan terbuka, terutama dari segi pembolehubah yang berkaitan dengan perkembangan perbendaharaan kata. Kajian ini mengkaji kesan kereaktifan terhadap perkembangan perbendaharaan kata semasa pelajar terlibat dengan aktiviti pemahaman bacaan. Secara khususnya, kajian ini berusaha untuk menangani isu metodologi akibat kesan kereaktifan terhadap tumpuan pelajar kepada bentuk proses atau proses bentuk leksikal dan proses makna dalam kepelbagaian situasi yang memerlukan tumpuan ketika menyelesaikan tugas. Dalam usaha untuk meneroka isu yang luas ini secara lebih berkesan, kaedah gabungan telah digunakan untuk menangani kepelbagaian aspek dalam isu kereaktifan dari sudut yang berbeza dan memberi kefahaman yang lebih jelas bagaimana dengan melakukan berfikir secara sedar dapat mendorong isu kereaktifan dalam intervensi eksperimen. Reka bentuk kajian eksperimen kuasi telah digunakan dalam kajian ini untuk menyelidik sebab dan akibat tumpuan peserta terhadap bentuk perkataan dan makna ketika terlibat dengan tugas pemahaman bacaan. sejumlah 27 pelajar Bahasa Inggeris sebagai Bahasa Asing telah dipilih untuk menjadi sampel dalam kajian ini. Peserta dibahagikan secara rawak kepada tiga kumpulan untuk melaksanakan pelbagai aktiviti berdasarkan hipotesis beban penglibatan. Dua instrumen kualitatif dan tiga instrumen kuantitatif (berfikir secara sedar, penulisan jurnal, ujian pemahaman bacaan, ujian bertulis perbendaharaan kata, serta pra-ujian dan pasca ujian untuk mengenal pasti makna perkataan) telah dilaksanakan untuk mengkaji isu kereaktifan. Keputusan yang diperoleh daripada protokol berfikir secara sedar dan penulisan jurnal menunjukkan bahawa terdapat kesan positif terhadap isu potensi kereaktifan melalui pengoperasian tahap kesedaran dan kedalaman proses yang boleh membantu dalam mengkaji isu kereaktifan. Kesan kereaktifan positif daripada berfikir secara sedar berlaku dalam semua jenis tugas pemahaman bacaan, terutama dalam glos aneka pilihan untuk mengenal pasti idea utama. Hasil kajian ini menghasilkan bukti kepada hubungkait antara tahap kesedaran dan tahap pemprosesan perkembangan Bahasa Asing. Secara keseluruhannya, kajian ini menyokong faedah *glossing* terhadap pengalaman memori dan perkembangan perbendaharaan kata. Kesimpulannya, input-output yang melibatkan pendorongan tugas membawa pelajar kepada tahap pemprosesan yang lebih mendalam dengan tahap kesedaran tinggi dan proses kereaktifan akan membangkitkan perkembangan perbendaharaan kata dan meningkatkan pencapaian pelajar dalam pemahaman bacaan

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LIST OF ABBREVIATIONS

EAP	_	English for Academic Purposes
EFL	_	English as a Foreign Language
ELT	_	English Language Teaching
ESL	_	English as a Second Language
FL	_	Foreign Language
IEC	_	Intensive English Course
IELTS	_	International English Language Testing System
IVL	_	Incidental Vocabulary Learning
L1	_	First Language
L2	_	Second Language
LTM	_	Long-Term Memory
SLA	_	Second Language Acquisition
STM	_	Short-Term Memory
TEFL	_	Teaching English as a Foreign Language
TESL	_	Teaching English as a Second Language
TESOL	_	Teaching English to Speakers of other Language
UTM	_	Universiti Teknologi Malaysia

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Vocabulary being the focal point of language often assists the students to understand and communicate with other language skills including listening, speaking, reading, and writing. Thus, vocabulary development plays a vital role in learning. Certainly, it is one of the primary areas in the English Language Teaching (ELT). Especially for Teaching English as a Foreign Language (TEFL), vocabulary appears as the heart of language comprehension. Alternatively, vocabulary is primarily responsible for the understanding and construction of connotation. Consequently, any practitioner (teacher or student) of English undertaking it as a foreign Language (EFL) is aware of the significance of vocabulary teaching and learning. It is apparent that learning of a foreign language (FL) involves extensive vocabulary knowledge (Rashidi & Ganbari Adivi, 2010).

Existing literature widely acknowledged that most of the FL vocabulary is acquired incidentally as a by-product of receptive activities such as reading and listening (Cho & Krashen, 1994). Research on FL vocabulary learning confirmed the contribution of reading in its incidental learning and FL acquisition (Nagy *et al*, 1987; Nation, 1990). It demonstrates that in reading, the meanings of unknown words are derived, learned, and developed when the purpose is not learning new vocabulary (Swanborn & De Glopper, 2002). This practice of picking up unfamiliar words and understanding the meaning of new vocabulary is called *incidental*

vocabulary learning (IVL) (Hulstijn, 2001; Schmitt, 2008). However, IVL through reading may not be effective for EFL learners (Laufer, 2001) because the learning of new vocabulary in FL through reading alone is weaker and inefficient (Hulstijn, 1992; Min, 2008). This little achievement of words only via reading is attributed to the lack of noticing. Schmidt (1995) emphasized that conscious attention is essential for effective learning with noticing as the first learning stage. However, it is quite possible that during reading the learners usually fail to notice the unfamiliar words, especially when the whole message of the text is understandable without knowing those words.

Several studies revealed the usefulness of reading plus condition or treatment of vocabulary exercises based on the text, where it enhances the word knowledge in incidental vocabulary learning via reading comprehension (Paribakht & Wesche, 1999; Laufer & Hulstijn, 2001; Swanborn & De- Glopper, 2002; Kim, 2008; Keating, 2008). Thus, reading based task emerges as a good activity to prepare a wealthy vocabulary input for learners because making a mental effort in reading the text without interrupting the reading process positively impacts the vocabulary learning (Laufer & Hulstijn, 2001).

Efficient L2 development requires various attentional models in Second Language Acquisition (SLA). They are vital for learners' enhanced attention, noticing, and awareness in FL learning (Schmidt, 1990). Numerous empirical studies identified different types of instruction and pedagogical techniques that drive learners' attention to the linguistic features embedded in the input. In this regard, the area so called glossing received considerable research attention, where the effectiveness of glosses on both incidental vocabulary learning and text comprehension are examined (Rott, Williams & Cameron, 2002; Rott, 2005; Martínez-Fernández, 2008, 2009, 2010). Majority of the researchers used concurrent verbal report of think-aloud as the best method to inspect language learners' cognitive process and operationalize the attention as well as awareness (Leow, 1997, 2001a, 2006; Rosa & Leow, 2004a, 2004b; Rott, 2005; Sachs & Polio, 2007; Martínez-Fernández, 2008, 2009, 2010).

The reactivity consideration is prerequisite in any discussion of think-aloud protocols. The act of think aloud during the completion of a task may alter the cognitive processes associated in performing the task triggering reactivity (Bowles & Leow, 2005). Studies on SLA indeed examine the issue of reactivity in concurrent verbal report while performing reading task on text comprehension and learners' performance (Leow & Morgan-Short, 2004; Bowles & Leow, 2005; Leow, 2006; Sachs & Polio, 2007; Bowles, 2008; Yoshida, 2008; Leow, Hsieh, & Moreno, 2008; Sanz, Lin & Lado., 2009; Goo, 2010). Few studies on SLA displayed that think-aloud while completing reading a glossed text is not really the reactive effect on vocabulary development and subsequent text comprehension (Martínez-Fernández, 2010). Yet, the issue of whether verbal reports of think-aloud while reading can impact the reactive effect of vocabulary development remains uncertain. Thus, the reactivity effect of think-aloud on vocabulary development in the context of EFL needs further investigation.

The present study attempts to address the reactivity effect of verbalising think-aloud when EFL learners engage in performing reading comprehension tasks based on the involvement load hypothesis. Meanwhile, it provides an inclusive outlook of what is the effect of think-aloud on vocabulary development when the students are engaged in reading for meaning and completing the comprehension task. Furthermore, it determines the influence of think-aloud in enhancing the students' performance in reading as well as text comprehension. Generally, the reactivity effect of think-aloud occurs when learners pay attention to the process of reading for comprehension and simultaneously place attention to the form processing (Morgan-Short, Heil, Botero-Moriarty, & Ebert, 2012). This study determines the reactivity effect of think aloud on the vocabulary development when the students engage themselves in reading for comprehension and simultaneously pay attention to the process of word form and meaning of the unfamiliar words related to the text.

1.2 Background of the Study

Research on first language (L1) and L2 development assumes that most vocabulary learning occurs naturally when learners attempt to understand new words they hear, read, or communicate. As aforementioned, such learning is called *incidental* because it occurs as learners focused on something other than word learning itself (Krashen, 1989). Paribakht and Wesche (1999) acknowledged that vocabulary acquisition produces through input operation hypothesis, where reading provides the comprehensible input that leads naturally to acquisition. Often, L2 educators assume that the main source of vocabulary development is instruction.

In the middle of the 1980s, vocabulary began to receive substantial attention among researchers, teachers in Teaching English to Speakers of other Language (TESOL), and materials developers. They were greatly influenced by the Krashen's (1989, 1994) hypothesis on SLA and the effect of the Schema theory in the context of reading comprehension (Nation, 1990; Coady & Huckin, 1997; Schmitt & McCarthy, 1997). Several factors are responsible for the renewed interests in vocabulary learning. The most important is the perceived need of English for Academic Purposes (EAP), where students are required to enrich the vocabulary.

Presently, EFL researchers and instructors indicate the significance of reading as a major source of input in language learners' vocabulary development. The lexical growth by engaging L2 learners in extensive reading depending on input-oriented language acquisition theory are emphasized (Huckin & Coady, 1999; Horst, 2005; Roszell, 2005; Pigada & Schmitt, 2006; Kweon, & Kim, 2008; Matsuoka & Hirsh, 2010; Rashidi & Piran, 2011). It is opined that language development occurs when learners are involved in the process of meaningful and contextualized input integrating new forms into their L2 systems through form-meaning connections (VanPatten, 1990, 1994).

EFL researchers, educators, and teachers admit the notable benefits of extensive reading because it provides the learners an opportunity to process unfamiliar words in diverse natural context (Rott, 1999; Roszell, 2005; Nasser &

Ra'ad, 2011; Mansour, 2011; Maha, 2012). They confirmed the positive role of Schemata in ESL/EFL reading comprehension (Mason & Krashen, 1997). Reading is further considered the essential source for the acquisition of less frequent lexical items (Coady, 1997; Ellis, 1994) that are usually encountered in texts only. So far, these words are part of advanced and superior learners' lexicons. The occurrence of an intimate correlation between reading comprehension and vocabulary knowledge (Paribakht, & Wesche, 1997; Rashidi & Ganbari Adivi, 2010) allows many FL/L2 researchers to conclude that "A reader's general vocabulary knowledge is the best predictor of how well that reader can understand text" (Anderson & Freebody, 1982, p. 3). Accordingly, vocabulary learning and development in ESL and EFL through reading is viewed as the most important instruction in the process of TESL and TEFL (Ellis, 1994; Joe, 1995; Huckin & Coady, 1999; Paribakht & Wesche, 1999). In fact, it is the most important task through which learners expand their vocabulary is reading comprehension (Anderson *et al.*, 1988).

Commonly, the researchers and theorists acknowledged the significance of reading for L2 learners' lexical development. It is revealed that learners incidentally gain a statistically significant amount of unfamiliar words while reading text for global comprehension (Hulstijn, 1992; Knight, 1994; Joe, 1995; Hulstijn, Hollander, & Greidanus, 1996). The majority of EFL researches among Arab learners approved the significance role of reading in incidental vocabulary learning as reading approach is the effective approach for vocabulary development (Rashidi & Ganbari Adivi, 2010; Mohammad & Saeed, 2012, Tahereh & Adelina, 2015). However, an ongoing debate on the effectiveness of reading for L2 learners' vocabulary development identified some pedagogical and methodological shortcomings (Hulstijn *et al.*, 1996). The lexical growth is described as a "by-product" (Diakidoy, 1993) of reading or as "accidental learning of information without intention of remembering that information" (Hulstijn *et al.*, 1996). It is believed that the words gain through reading an unpredictable process cannot influence either the instruction or the selection of materials or learners' approach to the reading task (Hulstijn *et al.*, 1996).

It is observed that Arab learners of EFL in various English classes are incapable of understanding the meaning of new vocabulary involved in the text and

fail to comprehend the meaning of the reading text (Nasser & Ra'ed, 2010). The SLA research that focused explicitly on incidental word gain through reading (Day *et al.*, 1991; Newton, 1995) has failed to explain, describe, and justify the factors responsible for the incidental word learning. The research on EFL displayed that incidental vocabulary learning through reading is ineffective for EFL learners (Laufer, 2001; Chen, 2006; Ali & Ali, 2011; Mohammed & Mousa, 2014). It is because the FL vocabulary gained from reading is very minute and often inefficient (Hulstijn, 1992; Day & Bamford, 1998; Min, 2008). This little achievement of words learned solely by reading is majorly ascribed to the lack of noticing (Mohammed & Mousa, 2014).

Categorically, the EFL researchers and instructors asserted that reading comprehension task that requires learners to read text and answer comprehension questions is an inadequate reading task for learners to construct the meaning of new vocabulary and understand the meaning of the reading text simultaneously (Hisham, 2010). EFL instructors use the reading text for different purposes in incidental vocabulary learning that require learners to focus on specific features of input crucial for learning (Swanborn & De-Glopper, 2002). However, the negative impact of such reading task including answering the comprehension questions in enhancing the reading comprehension, the construction of text meaning and learning the meaning of new vocabulary incidentally still to be clarified. Such negative effects of the task guide the learners to copy the sentences which are related to the questions in each text (Paribakht & Wesche, 1999). Some students answer the comprehension questions from the text without really understanding the answer. Eventually, it is really difficult to enhance and develop the vocabulary (Hisham, 2010).

Most of the reading techniques indicates that the lack of noticing or attention to the lexical words in reading comprehension task are the major factors for less achievement of word meaning of new vocabulary. Schmidt (1995) emphasized that conscious attention is vital for effective learning, and noticing is regarded as the first stage of learning. Moreover, it is quite possible that during reading, the learners fail to notice unfamiliar words in general and they can understand the whole message of the text without knowing those words in particular (Mohammed & Mousa, 2014). It

exhibits that in reading, apart from learning the meaning of new words, most of FL learners neither engage in making a mental effort of processing of lexical word form and meaning nor interact with the written words and sentence in the text (Mohammed & Mousa, 2014). It indicates that a kind of reading task based on task-induced involvement (mental effort) in word meaning processing including fill-in-task, multiple-choice word glosses, and input enhancement word is the effective approach to stimulate the learners' attention. It greatly promotes and enhances the vocabulary learning (Laufer & Hulstijn, 2001; Rott *et al.*, 2002; Rott & Williams, 2003; Rott, 2005; Martínez-Fernández, 2008).

During first encounter of a new word, learners can either guess its meaning and usage from available clues or find from the dictionary or via various word glosses. Others might take down notes along the margins, between the lines, or on separate vocabulary notebooks. They may also attempt to search the meaning of the word to fill-in-task and evaluate the word and its meaning with the blank to construct the meaning of reading the text. Each task demands the use of different activities, approaches, metacognitive judgment, choice, and cognitive strategies for vocabulary learning. Therefore, each strategy determines the extent of good learning of a new word.

Learners need to think while they are engaged in reading to construct the meaning of reading the text. Use of think-aloud model may help the learners to understand the text by thinking, practicing, reflecting, and ultimately building their comprehension. Such reading comprehension tasks enable the learners to use active reading strategies. This makes them to interact with the text, expand their recognition, benefit from their thoughts in deduction, understanding, and connect their notion with others (Eid, 2012; Ahmed, 2013). However, most of the EFL Arab instructors believe that the use of think-aloud technique is wastage of class time (Ahmed, 2013), and may lead to hinder the cognitive process. Although L2 learners think-aloud spend more time on two parallel carried out tasks to create extra learning but the use of think-aloud may facilitate learning by giving learners the opportunity to reflect on the primary process. This reflection leads to the discovery of new strategies or to the improvement of old ones. Thus, it promotes increased attention,

leads to deeper processing, more reasoning, and ultimately provides better revisions. This in turn creates an online processing during the reading process in working memory called “*reactivity*” (Sanz *et al.*, 2009).

The reactivity, the act of think-aloud, can potentially trigger the changes in students’ cognitive processes while performing the tasks (Leow & Bowles, 2005). The influence of think-aloud on cognitive processes is not yet empirically quantified in the context of vocabulary development in relation to the type of reading comprehension tasks based on task-induced involvement (Martínez-Fernández, 2008, 2010). In this view, present study explores and examines the process of reactivity effect of verbal reports of think-aloud on the development of vocabulary and on learners’ performance in reading comprehension while they engage in pedagogical treatments of reading comprehension task based on task-induced involvement.

1.3 Problem Statement

There are several unresolved issues in the teaching and learning of vocabulary through reading comprehension tasks. Present thesis identified three major challenging issues in the context of reading comprehension tasks. The first one is related to the function of using strategies of comprehension reading in EFL. The second involves the pedagogical treatment in teaching of vocabulary and reading comprehension tasks. The third issue focuses on the lack of research efforts that specifically examines the potentials of the reactivity effect creation on the concurrent verbalization and its impact on vocabulary development. These issues present valuable reasons in gaining a better understanding of the problems and realising the contributions of this study in making the learning of vocabulary and teaching of reading comprehension a more achievable and rewarding.

As aforementioned, reading comprehension being an integral part of education system in TEFL is considered as the essential factor in vocabulary learning. The importance of reading comprehension strategies allowed the past

researchers to pay much attention on reading comprehension instructions (Murphy, *et al.*, 2009). According to Levine, Ferenz, & Reves (2000), the ability to read academic texts is considered as one of the necessary skills for university EFL students. However, the process of reading achievement such as the use of strategies in reading is not a major concern to many EFL college students (Mokhtari & Reichard, 2002). Reading comprehension for every EFL learner encountering a text in every type can be a highly complex cognitive process, which involves intentional interaction between the reader and the text to create meaning (Tovani, 2000). Consequently, think-aloud as a strategy may assist to enhance learners' ability to think and understand what they comprehend (Block & Israel, 2004). It further allows the reader to associate meaning and understanding with the text. Some barriers related to think-aloud as a comprehension strategy in relationship to the teaching function of reading comprehension should be considered, which are seldom studied. This is essential to gain a deeper understanding of how think-aloud as a cognitive strategy can be used during reading comprehension to enhance and develop the meaning of new words on subsequent enhance text comprehension.

Previous research in SLA reported the influence of think-aloud, which is considered as a useful methodological tool for examining L2 students' cognitive processes and operationalizing awareness (Leow, 1997, 2000, 2001a, 2001b; Rosa & Leow 2004a, 2004b; Leow, 2006) and depth of processing (such as Leow *et al.*, 2008; Morgan-Short *et al.*, 2012). The concurrent verbal reports of think-aloud are able to display the learner's cognitive processes while interacting with the L2 (Bowles, 2010). Not much dedicated efforts are made to demonstrate the influence of think-aloud as a strategy and methodological tool to enhance text comprehension and vocabulary development (McKeown & Gentilucci, 2007; Yoshida, 2008; Khatami, Heydariyan, & Bagheri, 2014). Quality of think-aloud during reading task processing that provides another challenge to realize the update in enhancing text comprehension need to be explored. This gives the learners' some opportunity to reflect their thoughts and thought process. It may create new strategies for enhancing awareness and improving FL learners' performance in reading comprehension (Leow, 1997, 2000, 2001a, 2001b; Rosa & Leow, 2004a).

In the SLA field, the role of attention is a central issue to a wide variety of theoretical and applied perspectives. In the past, increasing efforts are made in operationalizing and measuring the attention, awareness, and depth of processing through the use of concurrent verbal reports called think-aloud protocols (Leow, 1997, 2000, 2001a, 2001b; Rosa & Leow, 2004a, 2004b). All these developments posed an additional task or alteration of cognitive processes triggering reactivity. The reactivity issue has motivated to examine the effect of think-aloud during task completion (Leow & Morgan-Short, 2004; Bowles & Leow, 2005; Goo, 2010; Martínez-Fernández, 2010; Stafford *et al.*, 2012). The role of verbalisation in L2 learning is still an open empirical question, especially in terms of variables that may moderate the findings. Only few investigations are performed on the issue of simultaneous attention to form and meaning in L2 written input and comprehension (VanPatten, 1990; Wong, 2001; Leow *et al.*, 2008). These studies are based on VanPatten's (2004) Primacy of Meaning Principle, which postulated that learners' process the input for meaning before they process it for the form. A possible problem of think-aloud, however, is their potential reactivity that remains unanswered. For some tasks think-aloud that may actually alter the cognitive processes involved in the task needs further explanation. In these cases, the internal validity of the research is clearly compromised.

Although concurrent think-aloud protocol has been shown to be nonreactive for certain written comprehension tasks (Leow & Morgan-Short, 2004; Bowles & Leow, 2005; Bowles, 2008), its potential reactivity has not been examined in reading comprehension task. Careful studies are needed especially when FL learners pay attention to the process of a particular word form and meaning of the unfamiliar words in the input while engaging in a written comprehension task. The results from Leow *et al.* (2008) may potentially provide further insight into the allocation of attentional resources to input. It is important to analyse the role of reactivity in vocabulary development, more generally in text comprehension tasks in which FL learners pay attention to word form and meaning of the unfamiliar words and meaning of reading simultaneously. So far, limited study examined the potential reactivity of think-aloud in FL task that allocated learners to direct their attention to

form while reading a passage for meaning with a passive effect on text comprehension (Morgan-Short *et al.*, 2012).

Not much research has been carried out on the language acquisition, particularly the reactivity effect of think-aloud in the FL in less explicit condition that triggers the vocabulary development (Halah, Norazman, & Tina, 2016). The issue of the reactivity effect in verbal protocol of think-aloud while performing reading comprehension task based on task-induced involvement on vocabulary development in relation to the level of awareness and depth of processing is facilely addressed (Martínez-Fernández, 2008). Limited research in SLA revealed that think-aloud while reading a glossed text does not have reactive effect on text comprehension, lexical word meaning recognition and production. This is attributed to the control of think-aloud in the experimental tasks. This aspect of think-aloud in triggering the reactivity on vocabulary development of learners requires further careful studies investigation.

To sum up, there has been limited research in EFL investigated the effect of think-aloud in triggering the reactivity on vocabulary development when the learners were reading for comprehension and simultaneous paying attention to the process of word form and meaning of particular words in the text. In addition, limited research in TEFL investigated the effect of reactivity on FL learners' performance and enhance text comprehension. Therefore, a question raised on how to think aloud as a strategy, a tool, and a method have the effect of triggering reactivity on vocabulary development, enhance FL learners' performance in reading comprehension, and enhance text comprehension.

1.4 Purpose of the Study

This study will prove the think-aloud protocols can trigger reactivity on vocabulary development when the participants are engaged in the process of reading for comprehension through three different types of tasks based on task-induced involvement. The overall goal is to operationalize students' awareness in the process

of word form and meaning of unfamiliar words during the process of reading for comprehension.

This study attempts to develop the pedagogical treatment of reading task based on task-induced involvement through utilizing concurrent think-aloud as a method to operationalize English language learners' cognitive processing, attention, and awareness. Furthermore, it examines the effect of performing three independent processes of reading comprehension tasks based on different of attentional condition (types of glosses) on vocabulary development. Following the previous works on specific aspects of the reactivity effect of think-aloud (Leow *et al.*, 2008; Short-Morgan *et al.*, 2012), this thesis comprehensively examines various effects of simultaneous attention to the process of word form and meaning during the process of reading for comprehension. It also explores the effect of noticing and attention types on learners' performance in both reading and text comprehension. Besides, it inspects the components of the reactivity induction effect of think-aloud when the students are engaged in the process of reading for comprehension and a simultaneous paying attention to the process of lexical form and meaning of the unfamiliar words.

1.5 Research Objectives

Based on research background, problem statement, and purpose the following objectives are set:

1. To determine the reactivity effects of verbal reports of think-aloud on incidental vocabulary learning and vocabulary development in relation to the type of reading comprehension tasks.
2. To examine the reactivity effects of verbal reports of think-aloud on students' performance in reading comprehension.

3. To investigate whether the reactivity effect of think-aloud might affect positively on reading comprehension in relation to the level of awareness with different types of task.

1.6 Research Questions

Based on the stated objectives, the following research questions are developed:

RQ1. What is the effect of think-aloud protocol on vocabulary development while performing reading comprehension tasks?

RQ2. What is the effect of think-aloud on students' performance in reading comprehension while performing reading comprehension tasks?

RQ3. How does the reactivity effect of think-aloud facilitate the learning while performing reading comprehension tasks?

1.7 Hypothesis of the Study

H1. Think-aloud triggers the reactivity on vocabulary development while performing reading comprehension tasks.

H2. Think-aloud triggers the reactivity on students' performance in reading comprehension while performing reading comprehension tasks.

1.8 Scope of the Study

This study is based on quasi-experimental research design among a group of EFL students at Universiti Teknologi Malaysia (UTM) who underwent through reading instruction. The participants are EFL Arab students from different majors pursuing their postgraduate studies (Master and Doctoral) at UTM (Malaysia). All the participants (about 27 to 30 in numbers) had completed the intensive English course administered in their intermediate level. These participants have the same level of background knowledge and chosen purposively based on research questions and research design of this study. Currently, they are all undergoing through the reading of Intensive English Course (IEC). This IEC programme is designed for non-native speakers who wish to pursue their academic studies in Malaysia. The main aim of IEC is to prepare students to develop the English language as a preparation to carry out their undergraduate or postgraduate studies in UTM. Specifically, the purpose of IEC is to equip learners with skills of reading, writing, listening, and speaking for academic as well as for social purposes

All the participants are native speakers of Arabic Language. Selection is made based on the IEC and IELTS results as well as intermediate level of English language proficiency. The different types of attentional conditions of reading task based on task-induced involvement are crucial in discovering the types of noticing, the level of awareness, and the level of processing. This might trigger the reactivity induction process that effects the vocabulary development and subsequent text comprehension. The level of awareness and the level of processing are examined through think-aloud in exploring the process of reactivity.

1.9 Limitations of the Study

This study possesses many limitations. First, it deals with the small number of participants (27-30) for the quantitative analysis. Second, it aims to investigate the reactivity effect of think-aloud on EFL vocabulary development in relation to the level of awareness and depth of processing. However, the process of reactivity on

EFL grammatical development in relation to the level of awareness and depth of processing are not included in this study because it focuses only on the vocabulary development.

With regard to the recognition and production post-test of comprehension and vocabulary, this study intends to explore the reactivity on vocabulary development from three independent reading task, post-test recognition, and production of word meaning of vocabulary. Unlike previous studies in SLA that generally finds that think-aloud while completing a task does not have a significant effect on L2 development, text comprehension, and vocabulary development (Bowles, 2008; Guidi 2009; Martínez-Fernández, 2010) this study does not use delay recognition and production post-test of word meaning of vocabulary. This is because the aim of the present research is to explore how think-aloud while completing reading comprehension tasks induces the reactivity on vocabulary development. Thus, the process of reactivity is occurred on working memory in intake processing during the process of reading task. Therefore, it is not important to employ delay recognition and production post-test.

Another limitation of this study is that the experiment involved the reading comprehension tasks, and not other language tasks listening, speaking, and writing. Although reading task considered as a receptive task but the task of reading comprehension, in this study, combined two language skills (receptive and productive). It is because the type of reading comprehension task is designed based on making the learners engage in deep mental effort in two of cognitive processes. These include the process of reading for comprehension and the process of producing the in-written task for significant understanding of the reading text.

1.10 Significance of the Study

The significance of the study emerges from the insufficient vocabulary development of EFL Arab students' while they are engaged in reading comprehension tasks. This study offers to develop EFL students' sufficient

awareness on new vocabulary when they engage in reading through think-aloud. Each pedagogical treatment of reading contributes to trigger the changing of the students' cognitive process (reactivity) when they are engaged in performing reading comprehension task. It is believed that this type of technique during the reading process may provide a crucial role in affecting students' vocabulary development and would help them in enhancing their performance in reading comprehension. This would eventually enhance text comprehension of the reading text.

This study is designed to change and develop the methods and strategies needed in teaching reading comprehension task to develop the meaning of new vocabulary and ultimately construct the meaning of reading the text. Thus, it is advantageous to make an empirical contribution to the long-contested issue of task efficacy with respect to incidental vocabulary learning. In a pedagogical sense, this study is expected to shed some light on the effectiveness of the Involvement Load Hypothesis (Laufer & Hulstijn, 2001) in predicting task efficacy. Consequently, it would assist the development of tasks useful for best fostering of the vocabulary learning in an incidental setting.

By employing think-aloud when the students engaged in reading comprehension task one can allow the students to benefit from their insights for enhancing their performance and understanding the reading text, ultimately having the ability to construct the meaning of text reading. Furthermore, this study is expected to shed some light on the complex interaction between verbalisation of think-aloud as a method, pedagogical treatment of reading comprehension, and vocabulary learning which contribute to our understanding of these areas.

Present study may help the practitioners in the area of cognitive psychology to comprehend how think-aloud stimulates students' attention to the process of understanding the meaning of the new words involved in reading text and complete reading tasks with reactive effect on vocabulary development. In addition, current findings may contribute to improve the evidence found in cognitive psychology studies. It states that humans have a limited capacity for processing information (McLaughlin, 1987). It is found that asking L2 learners to any attention to

grammatical relative to lexical forms would have a negative effect in their ability to get meaning from the input.

The findings of this study would also highlight the effect of utilizing the think-aloud on learning of vocabulary in reading comprehension programmes. Thus, the results could be helpful for both instructors and EFL students to understand the significant role of think-aloud as a useful method to be used by the students in the language classes, especially for reading. They can further train on how to use this technique efficiently. Furthermore, this study with its contribution may lead to a number of recommendations that can be helpful in improving the teaching and learning reading of EFL students. It is expected to enhance students' thinking processing and provide them an opportunity to think and perform critical thinking in understanding the meaning of new vocabulary and subsequent reading of text.

It would also help the learners to enhance the process of reading comprehension, specifically to promoting the development of non-primary language knowledge. It is also important to extend and open the avenue to change the learners' role in reading processes from a passive or negative role into the affirmative one in the process of reading comprehension. It may bring a change in the pedagogy of reading task from reading silently and using a dictionary to the interaction and engaged students in deep cognitive processing during reading. By using think-aloud as a method combined with completing reading tasks as a dual task it would strengthen the learners' skills. According to Sanz *et al.* (2009), combination of think-aloud with reading task may support each other. These two actions decrease the tasks of the learning process, trigger awareness, and generate a situation that often leads to positive reactivity.

By confirming the hypothesis, the research findings would give the students an opportunity to improve strategy that leads to enhance their performance in learning especially towards the development of vocabulary. This reflection according to Russo, Johnson & Stephens (1989) may result in the detection of new reading strategy or promote the existing one. These assertive findings would eliminate the boring learning approaches while completing the reading tasks.

Through the incorporation of the concurrent verbalization of think-aloud in reading comprehension task, students' awareness would be stimulated. It would give them attention in struggling to focus in deep processing and changing more strategies. It may enhance these strategies to know the meaning of the unfamiliar words to accomplish the understanding of reading text. Consequently, it may help them to complete the reading task. In other words, by performing think-aloud students may become more motivated to learn the meaning of the new vocabulary. They can put more attention on the unfamiliar words when they are engaged in the completion of reading comprehension task rather than using the conventional method of learning the meaning of new words. Such efforts of integration may contribute to making students to gain self-regulated learning process of reading comprehension.

1.11 Theoretical Framework of the Study

This study stimulates the performance of learners to construct the meaning of the unfamiliar words in the reading. It demonstrates the role of think-aloud triggered reactivity on the vocabulary development when participants are engaged in the process of reading for comprehension and simultaneously pays attention to the process of word form and meaning of the unfamiliar words in reading text. The theoretical framework presented in Figure 1.1 provides a basic insight of the hypotheses those are used to discuss and support the process of reactivity effect of think-aloud. It is affirmed that the incorporation of think-aloud in the research design with the pedagogic treatment of reading comprehension tasks may potentially trigger the reactivity on the vocabulary development. Furthermore, it promotes the students' performance in both reading and text comprehension.

The process of reactivity effect of think-aloud can be made apparent through comprehensible hypothesis of output (Swain, 1985, 1995, 2000), according to which language production facilitates learning through provision of extra input and development of awareness (Swain, 1995). Incorporating verbal protocols into a pedagogical task has the potential to promote noticing and awareness and ultimately

be advantageous to learning based on noticing hypothesis (Schmidt, 1990, 1993), attention with (a low level of) awareness, and working memory that is necessary for intake to take place (Schmidt, 1990). Think-aloud during the processing of task might create extra learning opportunities, promote increased attention, and lead to deeper processing, more reasoning, and, ultimately, better revisions (Jourdenais, 2001) based on deep of processing model, which postulated that the deep mental of processing contributes to more elaborate, long lasting, stronger traces, and affected memory function (Craik & Lockhart, 1972). Think-aloud during the processes of reading may stimulate the learners' attention to process of word form and meaning of the new vocabulary based on the involvement load that language task which motivates students to explore and estimate the meaning of new words leads to greater vocabulary development (Laufer & Hulstijn, 2001). This can be achieved via the processing of reading the text for meaning and comprehension. Verbal report involves intervening during the performance of a task has been criticized for the inevitable reactive effects that such intervention causes (Cohen, 1987).

A processing of form-meaning connection is aroused in the working memory during the reading processing when learners performed their thoughts aloud during the reading for meaning and comprehension. Simultaneously they pay attention to the process of word form and meaning of the unfamiliar words in the reading text (VanPatten's (2004). This process of form-meaning correlation seems to alter the structure of cognitive processes, which produce reactivity (Morgan-Short *et al.*, 2012) on the vocabulary development. The existing challenges and issues in the processing of reactivity based on the psycholinguistic notion of the L2 learner as a limited capacity processor (McLaughlin, 1987) are evidenced.

Present study examines the processing of reactivity on the vocabulary development through different types of attentional condition (different types of glossed task) of reading comprehension task as an alternative independent treatment depending on the load hypothesis association. Besides, it supports the notion of task that stimulates and motivates learners' attention to explore and estimate the meaning of new words towards better learning and generating new vocabulary meaning (Laufer & Hulstijn, 2001). It is established that the level of awareness may be raised

depending on a notion of noticing (Schmidt, 1990). This implies the attention with low level of awareness and working memory which is necessary for the intake occurrence.

Incorporation of think-aloud verbalization together with the pedagogical treatment of reading process for comprehension as an extra input treatment is prospective to promote the noticing. This also induces the awareness through the hypothesis of noticing (Schmidt, 1993) and comprehensible output in SLA (Swain, 1985, 1995, 2000). Thus, present study addresses the occurrence of reactivity in working memory when the learners interact with L2 input processing and concurrently pays attention to process the word form and meaning of new words in reading text. VanPatten's (2004) models assert that processing being an online phenomenon that occurs in the working memory often makes form-meaning/function relationships during real time comprehension. These fundamental theories are the essential components in enhancing the reactivity effect triggered vocabulary development. Consequently, participants' performance is enhanced to construct the meaning of the reading text.

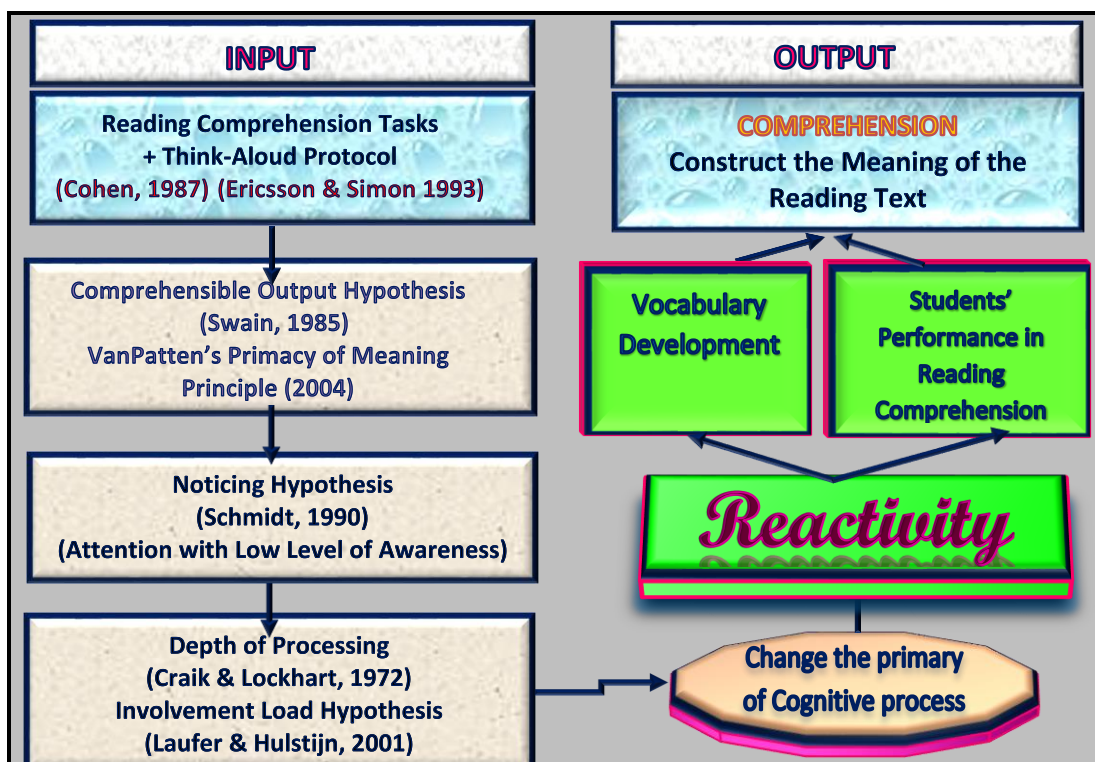


Figure 1.1: Theoretical Framework

1.12 Operational Definitions

This section defines the specific and essential terms used to understand, describe, and discuss the nature, boundaries, as well as objectives of this study.

1.12.1 Think-Aloud Protocol

Think-aloud is an activity or a strategy used by readers or learners to verbalize their internal thoughts while constructing and understanding their reading text (Leow & Bowles, 2005).

1.12.2 Concurrent Think-Aloud

Concurrent think-aloud protocols are acts of participants' verbalisation that collected as subjects verbalize while performing the task in question (Bowles & Leow, 2005).

1.12.3 Retrospective Think-Aloud

Retrospective think-aloud protocol is the act of participants' verbalisation of their thoughts are required to recall what they were thinking while they were involved in the process of completing the task after performing a task (Ericsson & Simon, 1984, 1993; Bowles & Leow, 2005).

1.12.4 Reactivity

Reactivity is the act of think-aloud that appears in the working memory potentially triggering changes in learners' cognitive processes while performing the task (Leow & Morgan-Short, 2004; Yoshida; 2008).

1.12.5 Vocabulary Learning

Vocabulary learning is a learning condition occurs when the learners engaged in the deep processing of reading for comprehension and a simultaneous attention to the processing of meaning making of the word through a series of strategies and activities explored by think-aloud has effect in learning (Laufer and Hulstijn (2001).

1.12.6 Vocabulary Development

Vocabulary development is the process of engaging L2 and FL learners to be aware of own cognitive strategies and effective strategies during the performing of language task in order to construct the meaning of the new vocabulary (Giridharan & Conlan, 2009).

1.12.7 Reading Comprehension

Reading comprehension is the process of simultaneously extracting and constructing meaning through interaction and involvement with written language when learners decode words, determine vocabulary meaning, read fluently, and comprehend (Snow, 2002; Afflerbach, 2007)

1.13 Summary

This chapter introduced various issues and challenges related to TEFL. Specifically, teaching and learning of vocabulary through reading comprehension tasks are emphasized. It provided a comprehensive overview of the essential insights and shed light on the unresolved issues by discussing the probable factors responsible for the processing in triggering the reactivity on vocabulary development in reading comprehension tasks. It also highlighted the objectives and research questions as well as hypothesis of the study to be accomplished. The theoretical framework is provided to support and strengthen the study.

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