

Utilizing ESL Learners' Socio-Cognitive Resources to Enhance
General Academic Vocabulary Acquisition

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Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Educational Studies

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Abstract

This study examined the extent to which English as a Second Language Learner (ESL) graduate students' socio-cognitive resources (the combination of culturally relevant imagery and first language (L1) facilitate their Second Language (L2) general academic vocabulary acquisition in a social learning setting. The study investigated whether the use of culturally relevant imagery and L1 translation equivalents facilitate retrieval of new general academic vocabulary. The study was informed by the following theories: Levels of Processing Theory (Craik & Lockhart, 1972), Vocabulary Learning Strategy Taxonomy (Gu & Johnson, 1996), Social Constructivist Theory (Vygotsky, 1978) and the Bilingual Dual Coding Theory (Paivio & Desrochers, 1980)—which assumes that bilinguals' cognitive activity is mediated by their two verbal systems and the image system representing their knowledge of the world. Utilizing a sequential explanatory mixed method strategy, the study first explored the general vocabulary learning strategy (VLS) preferences of 41 ESL graduate students with a survey. Then with a sub-sample of nine ESL graduate students, in a collaborative setting, the study used a case study approach to determine the extent to which a VLS that utilizes the socio-cognitive resources of the bilingual might activate the connections in the verbal systems and image system that lead to deep processing and retrieval of new vocabulary. The findings of the study indicate that the ESL learners' socio-cognitive resources have a positive impact on their general academic vocabulary acquisition. Outcomes of the study inform students and educators alike on how a VLS honouring ESL learners' socio-cognitive resources can be utilized to enhance general academic vocabulary acquisition. It also contributes to a domain of teaching and learning where there is a dearth of literature.

Acknowledgements

I would like to extend my sincerest thanks to all of the faculty and staff in the Faculty of Education at Brock University and the Faculties of Education associated with the Joint PhD in Educational Studies program. I would also like to thank all my participants for taking time from their busy schedules and helping me with the data collection process. My sincere thanks also go to my committee members, Dr. Diane Collier and Dr. Zuo Chen Zhang, for providing me insightful comments, direction, and encouragement. I would like to express my sincere gratitude to my supervisor Dr. Tiffany Lynn Gallagher for her continuous support, encouragement, and patience throughout my PhD journey. Her guidance helped me in every step of my research and writing of this dissertation. I could not have imagined having a better supervisor and mentor for my PhD studies.

My sincere thanks are due to all my family and friends for their words and deeds of encouragement and valuable suggestions. A very special gratitude goes out to my friend Dulani for her valuable feedback and encouragement and Kumudu for always being there in times of need. Last but not least, I wish to thank my family for being understanding and supportive. I would like to thank my daughters Santhushi and Seraya for being tolerant throughout; my husband Kosala for being patient, supportive, and encouraging; and my mother for instilling in me the value of education.

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CHAPTER ONE: INTRODUCTION

This chapter provides a brief introduction to the current research study. It outlines the background of the study, definition of key terms used in the dissertation, statement of the problem, purpose of the research study, research questions, rationale, the theoretical framework that guided the study, the researcher's personal grounding on the issue, as well as the scope, limitations, and significance of the study in the current educational context. In the final section, an outline of the next five chapters is presented.

Background of the Study

English as a Second Language (ESL) learners entering postsecondary education in Anglophone countries face multiple challenges as they are expected to gain general language competence and academic language proficiency in addition to content mastery to engage in their academic learning (Beres & Woloshyn, 2017; Gu, 2013). They are required specifically to develop Cognitive Academic Language Proficiency (CALP) to successfully engage in their academic activities. CALP is defined as the level of proficiency required by an ESL student to understand challenging academic subject matter, which is often present in the classroom (Cummins, 1979, 1984, 2000, 2008). It may take an ESL learner about 5 to 7 years to reach fluency in CALP (Cummins, 2008). This time demand is a major concern for an ESL learner enrolled in a 2-year or a 4-year degree program in an Anglophone university.

Research suggests that there exists an achievement gap in terms of academic performance between native speakers of English and ESL learners (August & Shanahan, 2006; Bibian, 2006; Gu, 2013; Hakuta, Butler, & Witt, 2000; Stahl & Nagy, 2006). The achievement gap is not caused by a deficiency in language or conceptual development in

ESL learners, but by a deficiency in comprehending the language of instruction in educational institutions, which may be different from their first language (Gu, 2013).

The language difficulties encountered by ESL learners have been found to affect all areas of learning (Albers & Martinez, 2015; Baker, Simmons, & Kame'enui, 1995; Starr, 2009). In particular, one of the literacy skills that causes ESL learners insurmountable difficulties is vocabulary (Beres & Woloshyn, 2017; Ghorbani & Riabi, 2011; Hulstijn & Laufer, 2001; Laufer, 1997; Oxford & Crookall, 1990; Yang & Dai, 2011). In fact, it is identified as one of the prime explanations for the achievement gap between ESL learners and their native English-speaking peers (August & Shanahan, 2006). Trivializing this issue is impossible as vocabulary is situated in the centre of academic meaning systems and therefore, vitally important to academic success (Corson, 1997).

Vocabulary acquisition is a continuous learning pursuit and vocabulary knowledge is integral to the development of complex, domain-specific knowledge. A good lexicon enables learners to access their background knowledge with ease, express ideas, comprehend others, and learn new concepts (Evans & Morrison, 2011). These are key prerequisite skills of any academic program. An average native-English-speaking postsecondary student has a vocabulary size of about 17,000 word families (Goulden, Nation, & Read, 1990). Therefore, it can be assumed postsecondary ESL students in similar degree programs should also possess a vocabulary of the same size to successfully engage in their academic activities. On the contrary, a study by Nation (2006) on the vocabulary size of a group of highly educated ESL learners pursuing higher education in English found that they knew only 8,000-9,000 word families. It should be noted that not all ESL students who enter higher education in Anglophone universities have vocabulary

challenges. In fact, it is those who are still trying to reach the required level of competence in the language of instruction, who encounter various language issues. These students are henceforth referred to as ESL learners, a subcategory of ESL students.

The language related issues encountered by ESL learners are numerous, however, vocabulary is most often identified as a major constraint to their academic development. Hence, it is imperative that postsecondary ESL learners are encouraged to devise strategies to enhance their academic vocabularies.

Definition of Terms

This section defines some of the terms (listed alphabetically) that are frequently used in this study.

1. **Culturally Relevant Imagery:** The researcher used this term for images that are derived from the individual learner's culture and are meaningful to the learner.
2. **Culturally Relevant Knowledge/Culturally Relevant Prior Knowledge:** This refers to the ESL learner's first language knowledge and knowledge of culturally relevant images.
3. **English as a Second Language:** This term is used for the acquisition of a second, third, or a fourth language either in a formal classroom setting or in an informal environment which enables the learner to acquire the target language (TL) through natural exposure (Gass & Selinker, 1994). The subsequent non-native language is commonly referred to as the "L2" or the second language. Gass and Selinker (2007) identify second language acquisition (SLA) as the process whereby a person learns a language after the acquisition of his/her first language (L1) in an environment where English is spoken as the official language or the

language of communication among people from diverse linguistic backgrounds.

4. English as a Second Language (ESL) Learner: Learners who learn English subsequent to their L1 are identified as ESL learners.
5. English as a Foreign Language (EFL) Learner: These learners learn English in an environment where it is not the primary or secondary language of communication. In such environments, English plays no significant role in society and is learned mostly in a classroom setting (Ellis, 2008).
6. English as a Second Language (ESL) learner graduate students: In the current study, the sample contains students who speak English as their Second Language with developing language skills. They form a distinct subcategory from the general category of ESL students, who may or may not have fully developed skills in English.
7. General Academic Vocabulary: The words learned by the participants in this study were taken from the Academic Word List (AWL), which is a list of words that appear with high frequency in English-language academic texts (Coxhead, 2000). The list contains 570 word families divided into 10 sub-lists; each sub-list contains 60 word families (except for sub-list 10, which contains only 30). For example, sub-list 1 consists of the 60 most common words in the AWL; sub-list 2 contains the next set of most frequently used words. The list was compiled following an analysis of over 3,500,000 words of texts (e.g., academic journals, textbooks, course workbooks, lab manuals, and course notes) from a range of academic subjects and disciplines. The AWL is useful to all second language learners studying in an English-speaking higher education setting irrespective of

their fields of study. The AWL does not, however, include technical words that are specific to a given field (e.g., photosynthesis), nor does it contain words that are of general use (e.g., hypothesis).

8. Pluriculturalism: This affiliation develops when multiple individuals from multiple backgrounds identify with multiple cultural groups (Celik, 2013)
9. Plurilingualism: This is the capacity of individuals to use more than one language in social communication irrespective of their command in those languages. “This set of skills constitutes the complex but unique competence, in social communication, to use different languages for different purposes with different levels of command” (Beacco, 2005, p. 19).
10. Socio-Cognitive Resources: In the current study, socio-cognitive resources entail the learner’s First Language, Second Language, and culturally relevant imagery.
11. Translanguaging: This can be defined as flexible language use that occurs naturally among bilinguals/multilinguals. As stated by Canagarajah (2011), “for multilinguals, languages are part of a repertoire that is accessed for their communicative purposes; languages are not discrete and separated, but form an integrated system for them” (p.1). In other words, translanguaging is a process that entails a variety of “cognitive processing skills in listening and reading, assimilation and accommodation of information, choosing and selecting from the brain storage to communicate in speaking and writing” (Lewis, Jones, & Baker, 2012, p. 644). In terms of vocabulary acquisition, this entails moving beyond the translation of words from the L2 to L1 to “finding parallel words [for] processing and relating meaning and understanding (Lewis et al., 2012, p. 644).

12. Vocabulary Learning Strategies (VLS): These are a sub category of language learning strategies used by learners which enables independent vocabulary learning.

Statement of the Problem

Most ESL learners are deficient in both breadth and depth of English vocabulary (August, Carlo, Dressler, & Snow, 2005). In other words, they not only have smaller vocabularies in comparison to their English-speaking peers, but also know fewer meanings of the words in their current vocabularies. As this directly impacts the academic performance of ESL learners in Anglophone postsecondary educational institutions, it is vital to offer intervention strategies to enhance their academic vocabularies.

Although there is ample research exploring the impact of didactic instruction on vocabulary learning strategies (VLS) (e.g., August et al., 2005; Baumann, Edwards, Boland & Font, 2012; Biemiller, 2003; Dóczy, 2011; Ghorbani & Riabi, 2011; Gu, 2005; Hummel, 2010; Hunt & Feng, 2016), so far there has been only a handful of studies discussing how ESL learners' socio-cognitive characteristics, such as the two verbal systems, the image system (e.g., Paivio, 1971; Paivio & Desrochers, 1981), and their culturally relevant knowledge can all be utilized in combination with each other to enhance their academic vocabularies. Up to now, little attention has been given to the fact that the image system of an ESL learner contains imagery that may be significantly different to those found in the L2 cultural environment. The role of L1 in L2 learning is also downplayed in the actual classroom despite the vast number of studies on its efficacy in L2 learning (Artieda, 2017; Cook, 1992; Ellis, 2005; Hunt, 2012; Liu & Zeng, 2015; Macaro, 2009; Turnbull & Arnett, 2002).

Relevance of the Study

The number of international students enrolling in Canadian postsecondary educational institutions has been increasing at a rapid rate during the last two decades (statscan.gc.ca). Canada remains a popular destination to pursue higher education among international students despite the high cost of tuition. Most international students come from non-English speaking countries and they encounter language-related issues that may impede their academic achievement to a significant extent. Given the fact that some of these students return to their countries in pursuit of prestigious positions, it is imperative that they receive support from their postsecondary institutions in order to achieve academic excellence. Thus, the outcomes of this study may equip them with a vocabulary learning strategy that builds on their existing socio-cognitive resources and enhances their general academic vocabularies.

Purpose of the Study

The purpose of this study was to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. The study investigated the impact and participants' views on the efficacy of a VLS that utilized their L1s and Culturally Relevant Imagery (CRI) in general academic vocabulary acquisition.

Research Questions

The overarching objective of this study was to investigate whether the activation of connections between the image system and the two verbal systems of the ESL learner graduate students can be utilized to enhance general academic vocabulary acquisition. Thus, the current study sought to answer the following research questions:

1. Research Question 1:

- (a) What are the vocabulary learning strategies currently popular among ESL learner graduate students?
 - (b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilise their culturally relevant prior knowledge?
2. Research Question 2: To what extent does culturally relevant knowledge facilitate deep processing and productive retrieval of new vocabulary words in ESL learner graduate students?
 3. Research Question 3: What are the experiences of ESL learner graduate students in using culturally relevant knowledge as a vocabulary learning strategy in a collaborative learning setting?

Research Question 1 will be answered through the collection and analysis of quantitative data for both a large sample and a sub-sample of ESL learner graduate students. Research Questions 2 and 3 will be answered through the collection and analysis of qualitative data for a sub-sample of ESL learner graduate students who participated in an intervention.

Rationale

Numerous studies have already been conducted on VLS use; however, most of these studies focus on vocabulary related issues encountered by immigrant school children (e.g., Biemiller, 2003; Brett, Rothlein, & Hurley, 1996; Brownell, 2000; Greene, Peña, & Bedore, 2013; Jackson, Schatschneider, & Leacox, 2014; Kigel, McElvany, & Becker, 2015; Kohnert & Bates, 2002; Palacios, Kibler, & Simpson, 2017). There are also a significant number of quantitative studies on the impact of VLS on the breadth and depth of vocabulary of both immigrant school children and adults (e.g., Nation, 2006; Qian, 1999; Rashidi & Khosravi, 2010; Schmitt, 2014). Nevertheless, only a few studies discuss how ESL learners' (bilingual or multilingual) cognitive architecture, prior knowledge, and experiences together can be utilized to facilitate vocabulary acquisition

(e.g., Jared, Poh, & Paivio, 2013). With the recent interests in translanguaging practices, plurilingualism and pluricultural competence (e.g. Beacco, 2005; Canagarajah, 2009, 2011; Piccardo, 2013, 2018; Vogel & Garcia, 2016), it is imperative to explore how learning strategies which recognize and validate learners' prior knowledge, competences and experiences can be incorporated into the teaching and learning processes. Hence, the current research study filled this void in the literature pertaining to VLSs that utilize the socio-cognitive resources of ESL learner graduate students. Findings of this study, while helping ESL learners to become more autonomous learners, may inform pedagogical practices in adult ESL courses.

Theoretical Framework

Four theoretical frameworks were foundational for this study: Craik and Lockhart's (1972) Levels of Processing Theory, which discusses levels of processing information; Paivio and Desrochers's (1980) Dual Coding Theory (DCT) and Bilingual Dual Coding Theory (BDCT), which elaborates how the cognitive activity of the bilingual mind is mediated; Gu and Johnson's (1996) taxonomy of VLS which includes imagery-based mnemonic and translation as viable VLSs; and Vygotsky's (1978) Social Constructivist Theory, which discusses the significance of social interaction in learning.

Levels of Processing Theory

Craik and Lockhart (1972) put forth the assumption that the processing of memory occurs on a continuum from shallow to deep, with deeper processing producing better memory. Research supports this assumption, suggesting that when information is processed at a deeper level, it is remembered better (e.g., Hulstijn & Laufer, 2001; O'Malley & Chamot, 1990). Accordingly, elaboration of the information received by way

of engaging in a meaningful and comprehension-based analysis of to-be-learned material, can lead to stronger memory traces, resulting in deeper processing of information.

Elaboration is a key consideration for learning. Elaboration of information is a cognitive activity that leads to stronger connections of ideas as it increases the distinctiveness of the information encoded (Hulstijn & Laufer, 2001; O'Malley & Chamot, 1990). Elaboration requires the learner to relate “new information to prior knowledge,” relate “different parts of new information to each other,” or make “meaningful personal associations with the new information” (Hummel, 2010, p. 63). Elaboration of information can be achieved in a variety of ways. For instance, visualizing information or constructing images to represent words or phrases can aid in deep processing and recall of information as images contain many details (Oxford & Crookall, 1990; Thornbury, 2002). These many details aid in the easy retrieval of the stored information. In sum, more elaborate encoding entails deeper processing of information resulting in more durable connections. Provided that associations are meaningful to the learner, the learner's existing word schemata will be strengthened rendering the new word more accessible (Oxford & Crookall, 1990). Thus, the final outcome of this process is better learning (Sokmen, 1997). Applying this assumption to the current study, when a word or a phrase is translated into ESL students' L1 and/or connected with an image that has cultural relevance, it may make the word more meaningful and lead to its deeper processing.

Translation is a cognitive activity closely related to elaboration (Hummel, 2010). It requires the learner to link a new word to its L1 equivalent. Canagarajah (2011) states that different languages in the multilingual's repertoire are not “discrete and separated” (p.1) and are accessed to achieve communicative purposes. Thus, he believes that proficiency building in multilinguals should aim at repertoire building rather than total

mastery of each separate language. It is clear that translation conforms to translanguaging practices. Thus, as stated by Canagarajah (2011), translanguaging enables multilinguals to adopt and appreciate practices that are unique to them.

Although translation from the L2 to L1 is discouraged in communicative language teaching as it is perceived to have a negative influence on L2 acquisition, there is an abundance of theoretical and empirical evidence in the psycholinguistics literature which validates it as a potential pedagogical tool (Hummel, 2010; Smetenek, 2018; Thornbury, 2002).

Hummel (2010) claims that although the active use of translation in vocabulary has not been adequately addressed, in certain language learning-teaching situations, it proves to be an effective tool: “The literature in the areas of language processing and memory processes contains suggestive support for cognitive advantages associated with translation that can be applied to L2 learning” (p. 62). In light of the current interest in translanguaging practices, it is imperative to explore how the L1 resources of ESL learners can be utilized to optimize L2 acquisition.

Dual Coding Theory (DCT)

DCT attempts to recognize and acknowledge the equal role played by the verbal and non-verbal systems in information processing. Paivio and Desrochers (1980) contend “cognitive activity is mediated by two independent but partly interconnected symbolic systems specialized for encoding, organizing, storing, and retrieving two kinds of stimulus information” (p. 389). The two systems consist of a verbal system, which is responsible for processing linguistic information and generating speech, and an image system, which is responsible for processing perceptual information related to non-verbal objects (Paivio & Desrochers, 1980). Figure 1 presents a visual depiction of DCT.

Though sometimes the verbal and the image systems can function independently, at other times, activities in one system may stimulate and initiate activities in the other. For instance, a verbal description of a particular event or an object can evoke relevant imagery in an individual's mind or vice versa due to the interconnectedness (i.e., referential connections) between the two systems (Paivio, 1971; Paivio & Desrochers, 1980). Additionally, at the associative level, other connections between linguistic units (logogens) or between images (imagens) can also be aroused. Components of information of a particular word or scene are organized in such a way that they are available at once in memory. Thus, it is apparent that the interaction between these two systems is conducive to vocabulary acquisition.

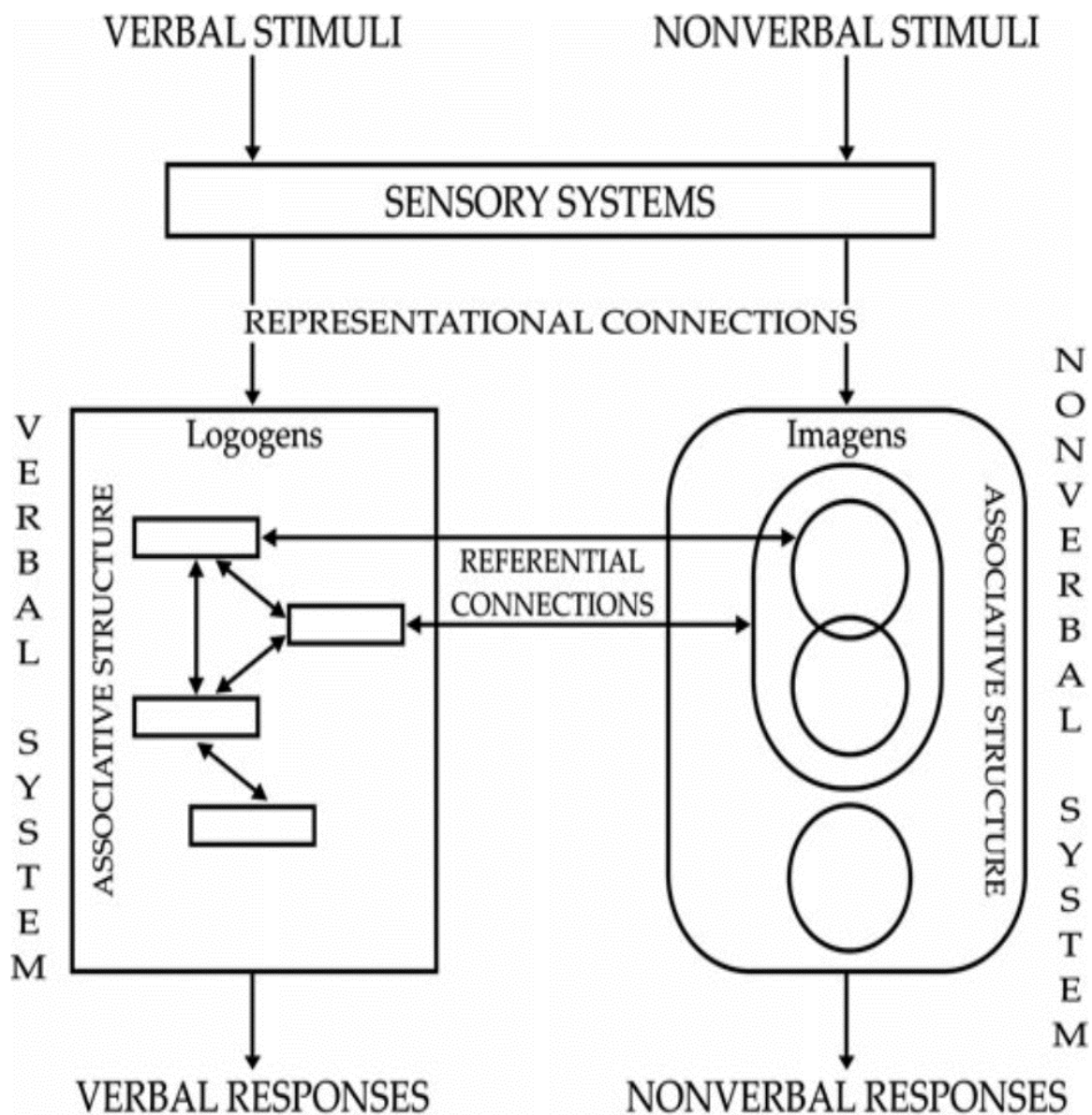


Figure 1. A visual depiction of DCT (Paivio, 1990).

Bilingual Dual Coding Theory (BDCT)

Bilingual Dual Coding Theory (BDCT) is an extension of the original DCT (Paivio & Desrochers, 1980). Refer to Figure 2 for a visual depiction of BDCT. The general assumption of the BDCT is that the cognitive activities of the bilingual are mediated by an image system and two verbal systems (V1 and V2) corresponding to his/her two languages (L1 and L2) that are both independent and interconnected. According to the BDCT, at the representational level, a bilingual individual is able to process information provided by each system separately with no intervention from the other. At the same time, at the referential level, as the two systems are interconnected, each system can influence the other.

The significance of the BDCT lies in the fact that the image system has the ability to provide means of indirect access from one language to the other. Thus, “under some circumstances and for some words, translation might occur indirectly in that a logogen in V1 activates imagens which in turn activate logogens in V2 permitting the translation equivalents to be accessed (Paivio & Desrochers, 1980, pp. 390-391).

However, it should also be noted that although the two verbal systems have connections to the image system at the referential level, “verbal translation equivalents in L1, and L2 may or may not activate the same imagens, depending on the way the two languages have been acquired” (Paivio & Desrochers, 1980, p. 391). This means, if the two languages were acquired in two different cultural contexts, the imagery aroused by translation equivalents will be specific to the context in which the languages were learned (Jared et al., 2013; Paivio & Desrochers, 1980; Zhang, Morris, Cheng, & Yap, 2013). In the case of the current study, the L2 was acquired prior to the arrival in the host country, Canada. Thus, it can be assumed both L1 and L2 words may evoke the same images for at least some of the L2 words that were acquired in the home country.

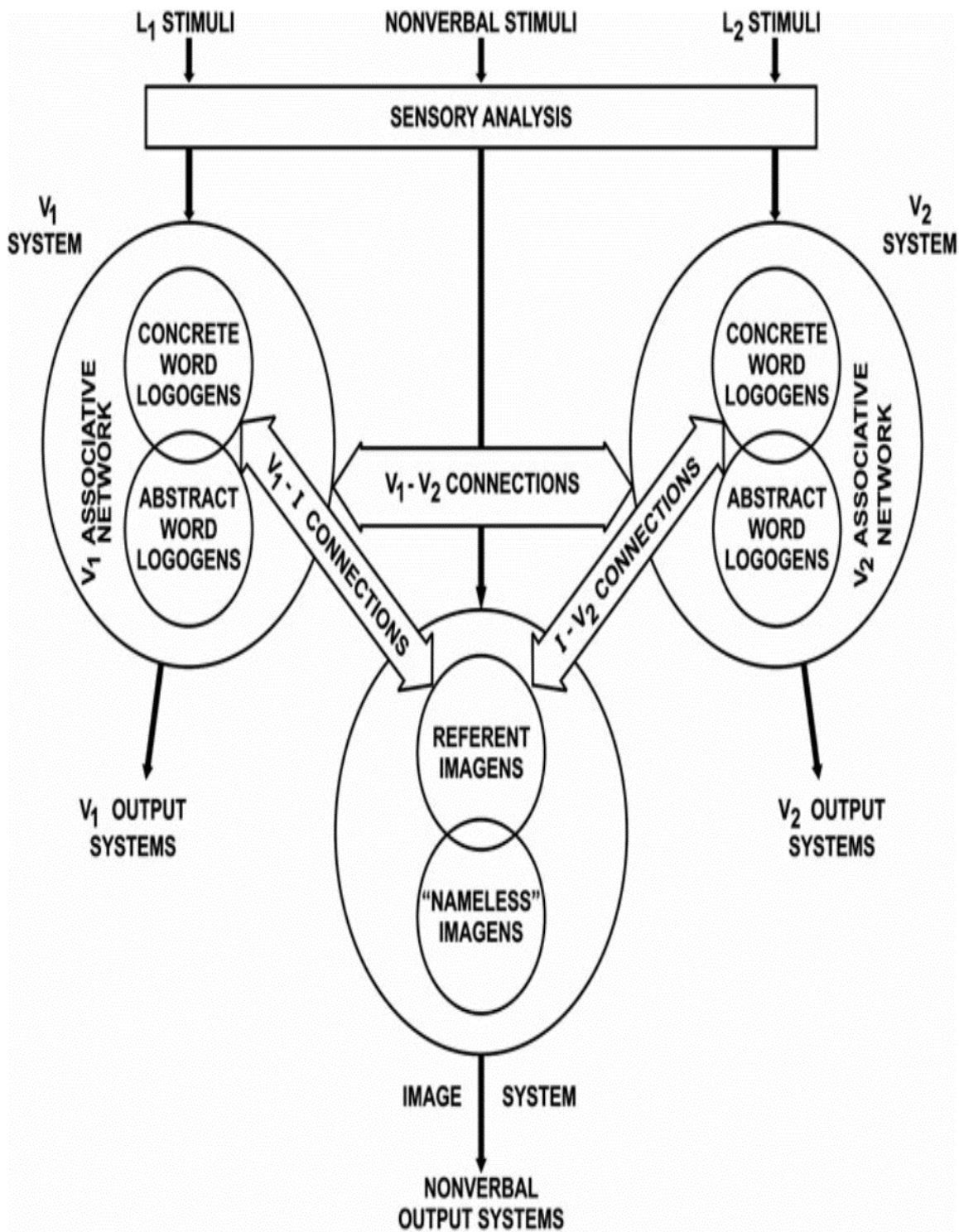


Figure 2. A visual depiction of BDCT (Paivio & Desrochers, 1980).

The interconnectedness between the systems contributes to the assumption that even though ESL classroom procedures generally mitigate the use of learners' L1, at times, its intervention is both inevitable and essential. This is true particularly in relation to L2 vocabulary acquisition (Lucas & Katz, 1994). For instance, according to cognitive processing theory, bilinguals possess a shared conceptual store for L1 and L2 vocabularies that is characterized by a substantial number of non-language specific semantic connections. A second assumption is that images that are used to represent L2 vocabulary should be culturally relevant for meaningful learning to take place (Lucas & Katz, 1994).

Vocabulary Learning Strategies (VLS)

VLS are considered language-learning strategies, which in turn, are one part of general learning strategies (Dóczy, 2011; Nation, 2001). VLS are defined as strategies or actions that learners employ to comprehend and remember vocabulary (Cameron, 2001; Takač, 2008). An impressive amount of work has been done in the field of vocabulary learning resulting in a number of VLS taxonomies (Gu & Johnson, 1996; Nation, 2001; Schmitt, 1997, 2000). Notwithstanding minor differences, all these taxonomies acknowledge the existence of vocabulary discovery and consolidation strategies and a variety of sub-strategies (i.e., cognitive, metacognitive, memory, and social), which fall under them.

Although language learners use a variety of VLS to overcome their vocabulary-related issues, there is an observable difference in strategy use between advanced and less advanced ESL learners (Nemati, 2008; Rahimy & Shams, 2012; Tsai & Chang, 2009). For example, advanced learners use more complex and meaning-focused strategies and demonstrate much versatility in vocabulary use. For instance, research proves mnemonic

strategies to be more effective than non-mnemonic ones in enhancing language acquisition since they demand deeper cognitive involvement (Paivio, 1983; Roediger, 1980; Takač, 2008).

Where VLSs are concerned, when supportive information is presented as pictorial and verbal cues, it exerts a positive influence on language learning (Farley, Ramonda, & Liu, 2012; Jones, 2004; Oxford & Crookall, 1990; Paivio, 1971, 2014; Shen, 2010). Other studies have found that words that are coded bilingually using learners' L1 are retrieved faster than the ones coded monolingually using only the target language (Francis, 2005; Jones, 2004; Paivio, 2014). Thus, it is apparent that certain VLS are more effective than others in enhancing vocabulary acquisition mainly because they are aligned with the learner's cognitive characteristics. Consequently, it is vital that learners are aware of the wide range of strategies available to them so that they can develop a repertoire of the most effective VLS and gradually learn to self-regulate strategy use.

Imagery-based mnemonics. Paivio and Desrochers (1981) assert that “imagery mnemonics can make language learning interesting because they render the new language meaningful even in the absence of an actual situation that demands use of that language” (p. 790). Examples of imagery-based mnemonics include the peg word/hook method, which aims at enhancing productive skills in the L2 “by providing a scheme that permits the learner to retrieve vocabulary units from memory without relying on external cues” (Paivio & Desrochers, 1981, p. 785) and the keyword method, which provides real-life situations for language use that creates referent situations in one's mind in response to words.

The keyword method in L2 learning involves the use of a familiar L1 keyword and visual imagery to establish an acoustic and a semantic bridge between a L2 word and

its meaning as represented by a familiar translation equivalent. The peg word/hook technique is also strategy that utilizes imagery. This technique is a mnemonic system that is often used to enable the recalling of lists of familiar vocabulary items. It uses “an ordered list of concrete words as cues for the recall of new items, recall being mediated by interactive images connecting the cues to the targets” (Paivio, 1983, p. 201). These real life situations help in the recall of meanings of the words.

Smith (1997) purports that visualization and imagery can be beneficial in learning new concepts as visual connections can spur new learning. As such, learning vocabulary can be more effective when learners visually represent a word and its related terms; thus, internal visualization of a word can be very valuable in education. Additionally, the use of visual texts has the ability to provide the learner personal links to education (Marquez-Zenkov & Harmon, 2007). In sum, VLS that entail deeper cognitive involvement such as imagery-based mnemonics should be promoted among students as such VLSs are quite effective in facilitating vocabulary acquisition.

Social Constructivist Theory

In general, constructivists consider learning as a dynamic process where learners are actively engaged in knowledge production as opposed to passively receiving knowledge (Flynn, Mesibov, Vermette, & Smith, 2004). Constructivist approaches underscore the significance of a deep understanding of the learning material (Jonassen 1999; Taber, 2006). Constructivists emphasize the importance of mastering learning strategies to facilitate knowledge acquisition. As well, constructivists purport that learners should be exposed to authentic scenarios that provide them with multiple representations of reality (Flynn et al., 2004). Social constructivism, which has its roots

in constructivism, proposes that individuals have their own perspective on reality, knowledge and learning.

Reality is constructed by members of a particular society through their collective activities (Kukla, 2000). Social constructivists highlight the importance of culture and context in understanding the world and constructing knowledge based on this understanding (Derry, 1999). Given that social constructivists view knowledge as a social and cultural construct, they ascribe to the notion that individuals understand the world by way of interacting with others in their environment. Thus, in congruence with this, social constructivists view learning as a social process, in which meaningful learning occurs through social interaction. This view of learning is directly relevant to the current study as ESL learners collaborated with each other in VLS application.

Specifically, social constructivists such as Lev Vygotsky believed knowledge is socially and culturally constructed where individuals create meaning of social phenomena through their interactions with the others in society (Gredler, 1997; Pritchard & Woollard, 2010). Learning first occurs in an interpersonal level, and then, moves to an intrapersonal level, where the individual internalizes the knowledge acquired through interacting with the external environment. It should be noted that, in this context, language functions as a tool that facilitates knowledge and skill acquisition (Vygotsky, 1986). According to social constructivists, the nature and the progress of learning are affected by two aspects: firstly, symbol systems such as language and mathematics the learner acquires from his/her culture; and secondly, social interactions with more knowledgeable others in his/her community (Gredler, 1997). This underlies the assumption that meaningful learning of symbol systems occurs when learners are engaged in social interaction.

Vygotsky's (1978) social constructivist theory underscores the importance of the zone of proximal development (ZPD), which is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 85). Although Vygotsky discussed this concept with reference to children, it can be applied to adult learning as well (Bonk & Kim, 1998). Given that learning is a social process, effective learning takes place when the individual is involved in social activity with others, where "new or repeated sensory input (e.g. words, pictures, music, stories and much more) is related to pre-existing knowledge and understanding ... and ... dialogic exchanges in collaborative tasks are important activity favourable to second language acquisition" (Anton & DiCamilla, 1999, p. 234).

It was of interest, in the current study, for the researcher to determine the willingness of the participants to collaborate and assist each other in creating CRI and determining L1 translation equivalents for new vocabulary items using their two verbal systems and the image system. Herein, social constructivist theory has been applied in this current study as it relates to the participants (i.e., ESL learner graduate students) co-constructing their language learning collaboratively. The researcher was not an active participant in this co-construction with them as she did not speak the participants' L1; all the conversations among the participants were in their respective L1s. The researcher intended for the participants to co-construct language learning among themselves as participants. The researcher did not want to change the dynamics of the communication and force the participants to use a language other than their first language. The

researcher's bias was that culturally congruent images must be created in the participants' culturally relevant language.

Researcher's Personal Grounding

The researcher is a Sri Lankan by birth and moved to Canada in 2012 to pursue a doctoral degree. She considers Sinhalese to be her first language although she grew up in a bilingual society where she was exposed to English from a very young age. Her bilingualism has been the result of a legacy left behind by the island country's one time colonial master, Great Britain. Despite becoming a sovereign state in 1948, traces of colonialism can still be observed in post-colonial Sri Lanka defining and dictating Sri Lankans' thought and behaviour.

Colonialism is considered an important factor in the definition of local identity and ethnicity (Dirar, 2007). As a result of her cultural heritage, the researcher grew up speaking two languages and acquiring certain norms and values of the West. In Sri Lanka, interestingly, most individuals who are bilingual from a very young age manifest bicultural characteristics as they are taught certain Western cultural norms both explicitly and implicitly. The researcher completed her elementary and middle school education in her vernacular and her secondary and postsecondary education in English. In congruence with this, the researcher's experiences and personality reflect the characteristics of a part Western, part Sri Lankan hybrid culture.

Being a member of this hybridity placed the researcher in a critical vantage position enabling her to become an ESL teacher and then, later on to pursue graduate studies in an Anglophone university in Canada. Due to her hybrid Sri Lankan identity, the transition has been smooth as she possessed the linguistic, sociolinguistic, discourse and

strategic competences, which are prime requisites to be successful in any language environment.

The researcher developed an interest in learning how ESL undergraduates cope with the demands of postsecondary education conducted entirely in a second language. This interest was based on her career as an ESL instructor for more than 10 years in postsecondary education in Sri Lanka. She witnessed how ESL undergraduates with poor ESL skills, but superior cognitive abilities, encountered difficulties in academic activities, which were primarily conducted in their L2 (English). Although English is taught in schools and is spoken everywhere in the country as a second language, ESL resources are not equitably distributed among the student population. Although most of the L2-deficient undergraduates can function extremely well in their L1, they struggle with both general and academic ESL vocabularies in pursuing their postsecondary education in their L2 (English). This puts these linguistically underprivileged ESL undergraduates at a disadvantage as their peers with better English language skills have an advantage over them. It is conjectured that inadequate skills in English, “can make them feel helpless, inferior, uneducated and disadvantaged” (Canagarajah, 1997, p.616).

The Sri Lankan university where the researcher taught offers English proficiency courses in order to help solve issues encountered by the undergraduates when pursuing higher education in their L2. Consequently, the researcher developed an interest in finding out the type of language related issues encountered by ESL undergraduates, how successful the university language courses are in helping learners overcome issues they encounter, and the types of pedagogical practices that take place within the university ESL classroom. As a consequence of this interest, she focused her Master’s research study on the teachers’ use of code switching in the university ESL classroom.

Gallagher, Barber, Beck, and Buehl (2019) observed that one of the biggest challenges ESL undergraduates encounter is their inadequate academic vocabularies. This challenge severely hinders their academic progress. The researcher began to question if these challenges existed for ESL learner graduate students. In her lived experience she noted that ESL learner graduate students who were from countries where English was spoken as a foreign language (EFL) encountered even more difficulties than ESL undergraduates in Sri Lanka. As an instructor, she recognized that ESL programs cannot teach all the required vocabulary needed for study programs, therefore, it is imperative that ESL learner graduate students become equipped with strategies that might enable them to enhance their productive domains such as speaking and writing, and their receptive domains such as their reading and listening vocabularies. This was the impetus for her pursuit of doctoral research that would be intervention based.

Preliminary background reading revealed that although there are several VLS taxonomies, issues associated with some of them prevent them from being fully utilized to maximize vocabulary uptake in ESL learners. First, VLS are rarely taught explicitly, and even when they are taught, they are often misused (Oxford & Crookall, 1990). Most of the common imagery-based VLSs are exclusively used to acquire concrete vocabulary items. Also, when they are used, the images are imposed on them either by teachers or Eurocentric learning resources (Canagarajah, 1993, 1997). As a result, learners are sometimes forced to use images that they are not familiar with. This places a double burden on the learner, for they are required to remember not only unfamiliar vocabulary but also alien images (Alptekin, 1993). Additionally, none of the VLS in the taxonomies explore how the learner's L1 or his/her culture, which may be considered a very valuable resource as it validates the learner's prior knowledge, can be utilized to learn L2

vocabulary. Therefore, from the researcher's bias and personal grounding, she conjectured that using the learner's culturally relevant knowledge (L1 + imagery derived from his/her culture) to encode general academic vocabulary, which mostly represents abstract ideas, may facilitate vocabulary acquisition.

Scope and Limitations of the Study

The current study explored a VLS that validated and utilized ESL learner graduate students' socio-cognitive resources. The study was based on the assumption that the learner's L1 and the use of learner determined CRI together enhance deep processing of new general academic vocabulary words due to their ability to create meaningful associations in the learner's mind. Also, the strategy intervention took place among participants sharing a similar linguistic and cultural background. These parameters define the specific scope of the research. Thus, generalizing the findings is not appropriate given the specific context of this study and the particular group of learners with certain L1s.

Significance of the Study

Although numerous studies have been conducted on vocabulary acquisition of postsecondary ESL students, there is a dearth of literature on the impact of a VLS that validates and utilizes their socio-cognitive resources in enhancing L2 vocabulary acquisition. Additionally, most previous studies have focused on the use of imagery to enhance concrete vocabulary acquisition; only a handful of dated studies have focused on abstract vocabulary (Mastropieri, Scruggs, & Fluk, 1988; Rose & Yesavage, 1983).

Thus, this study honoured the ESL learner graduate students' socio-cognitive resources that contain their L1 and culturally relevant knowledge. There was an investigation of an intervention designed to help them enhance vocabulary acquisition and thereby contribute to potential impact on their academic performance. Finally, the

outcomes of this research inform recommendations to postsecondary institutions for literacy support programs and equitable education opportunities for ESL learner graduate and undergraduate students.

Outline of the Remainder of the Document

Chapter 2 presents a comprehensive review of the literature pertaining to VLS research. First, it discusses findings of previous research studies on how ESL learners' socio-cognitive resources contribute to vocabulary acquisition. This is followed by a description of VLS, a brief critique of existing VLS, and research findings on the significance of VLS that utilize learners' L1 and imagery mnemonics. Chapter 3 entails detailed descriptions of the methodology and research design followed by ethical considerations and the limitations of the current study. Chapter 4 presents a summary of quantitative findings in response to Research Question 1 and the administration of a survey to a large sample of ESL learner graduate students. Chapter 5 is a presentation of the qualitative findings for a sub-sample of ESL learner graduate students who participated in an intervention. Chapter 5 offers a glimpse of their responses on the survey (Research Question 1) and then Research Questions 2 and 3 are answered through the presentation of findings based on the qualitative data. Chapter 6 presents a discussion of findings followed by implications for theory, implications for practice, methodological limitations, and implications for future research.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

This chapter presents a review of literature on ESL students' linguistic and cultural resources, vocabulary knowledge, strategies to overcome language learning challenges, processing of vocabulary, critique of existing VLS, and the need for culturally relevant VLS. The chapter ends with a discussion on the construction of learning strategies and collaborative activities. The literature review was guided by the key terms in the research objectives and the three research questions.

Research suggests that there exists an achievement gap in terms of academic performance between ESL learners and their native English-speaking counterparts (Bibian, 2006; Gu, 2013; Hakuta et al., 2000; Stahl & Nagy, 2006). This is often due to the inadequate skills of ESL learners in the language of classroom instruction. In addition to this, these learners experience difficulties caused by their lack of familiarity with the sociocultural characteristics of their educational environment (Zhang, 2016). In terms of language issues, one of the literacy skills that contributes to learners' insurmountable difficulties is vocabulary. Recent research specifically targets vocabulary as one of the main explanations for the achievement gap between ESL learners and their native English-speaking peers (August & Shanahan, 2006; Giridharan, 2012; Ramachandran & Rahim, 2004). Thus, vocabulary related issues in ESL learners have drawn a significant amount of attention from researchers.

Impact of Linguistic and Cultural Resources on Second Language

Most current English language-teaching practices are premised on pedagogical philosophies and traditions of the Western world. Consequently, the application of those practices to teach students who are from international contexts is contested (Canagarajah,

1999). Many traditional Anglo-American ESL pedagogical practices are based on the assumption that language learning includes value free cognitive activities disconnected from the socio-cultural environment (Piccardo, North, & Goodier, 2019) and that all cognitive strategies are universal. According to Canagarajah (1997), language systems are not mere collections of grammatical structures, rather semiotic systems, which embody the norms and values of any given speech community originating from its day-to-day life. The above-mentioned Anglo-American pedagogical practices fail to acknowledge the pivotal role culture plays in ESL learning and the fact that socio-cultural differences interplay with learners' comprehension and interpretation of the world. As "language education does not happen in a vacuum" (Piccardo et al., 2019, p. 19), it is imperative to explore the factors which influence the learning process and utilize them to maximise learning opportunities.

ESL learners possess a variety of cultural and linguistic resources. Plurilingualism and pluriculturalism acknowledge linguistic repertoires in the individual and allow for the inclusion of different levels of competence in many languages (Coste, Moore, & Zarate, 2009). A plurilingual has the ability to develop and use more than two linguistic resources, and similarly, a pluricultural speaker may rely on diverse cultural resources they possess in order to make sense of the world (Coste & Simon, 2009). As stated by Moore (2006), plurilingual and pluricultural speakers have the ability to activate one or many of their linguistic and cultural resources in their repertoire in any given situation as they have agency over their linguistic and cultural repertoire. Harnessing this full learning repertoire of an ESL learner is possible when plurilingualism and pluriculturalism are acknowledged (Piccardo, 2013).

Arabski (2006) draws on the seminal work of Lado (1957) that suggests that individuals are inclined to transfer the forms and meanings of their L1 and culture when attempting to receive and produce a second or a foreign language. This is because knowledge of L1 and culture are quintessential elements of an individual's life experiences. Culture also plays an important role in cognition (Alptekin, 1993). An individual's cultural knowledge should be acknowledged in L2 acquisition since, as stated above, previous knowledge plays a pivotal role in learning. Also, an individual's L1 is a part of his/her socio-cultural identity and is connected with his/her emotions, aspirations, world concepts, and group identity (Hopkins, 1988). Arabski and Vojtaszek (2011) identify language learning as "a social-psychological process, in which the role of a wider sociocultural context should not be marginalized" (p. 2). This suggests that if the learner's sociocultural background is not acknowledged, there may be a negative influence on the learning process. Therefore, the deliberate oversight of a learner's L1 and culture may be detrimental to his/her learning process.

The values represented in Western pedagogical practices and the culture of the ESL student may create a dissonance with possible detrimental effects on the learning process (Alptekin, 1993; Canagarajah, 1993, 1997, 1999). Additionally, the hegemonic tendencies present in ESL programs of the West portray the Anglo-American culture as superior to the culture of the ESL student (Canagarajah, 1999; Skutnabb-Kangas, 2000). Thus, it is imperative to question whether the mainstream pedagogy acknowledges and utilizes the cultural and linguistic capital of ESL learners. Under these circumstances, there is a need to re-evaluate the existing ESL pedagogies based on the mainstream Anglo-American norms.

Issues Pertaining to Academic Activities in ESL Learner Graduate Students

In postsecondary education, students are required to engage in cognitive activities that entail higher-order thinking skills. For instance, both graduate and undergraduate students need to demonstrate the capacity to comprehend complex ideas as well as the ability to analyze, synthesize, construct, and produce original texts (Evans & Morrison, 2011). Communication through reading, writing, speaking, and listening is integral to demonstrate these capacities. Thus, pursuing postsecondary education in a language other than the student's L1 is a challenging task if the student has not fully mastered the language of instruction.

Although ESL learners entering Anglophone universities are expected to meet the language requirements stipulated by the respective academic institutions, some of them fail as the language competence expected of them surpasses their current linguistic abilities (Olivas & Lee, 2006; Zhang, 2016). Beres and Woloshyn (2017) found that a group of Asian graduate students at a Canadian university were concerned about their inadequate ability to comprehend lecture content and vocabulary including discipline specific technical terms and knowledge presuppositions. Additionally, a skill that is expected of these ESL students is the ability to write in a coherent and scholarly manner. It is this skill that most ESL learner graduate students struggle with and that is a key factor behind their inability to meet the expectations of their postsecondary programs (Bacha, 2002; Zhu, 2004). An inability to write well may be attributed to deficiencies in their vocabulary knowledge.

Vocabulary Knowledge

Knowing a word involves acquisition of its meaning(s), the written form, the spoken form, the grammatical behaviour, its collocations (i.e., lexical neighbours), the register (i.e., appropriateness of use), the associations, and the frequency of its occurrence (Nation, 1990, 2001). Webb (2005) proposes five aspects of vocabulary knowledge: orthography, syntax, association, meaning and form, and grammatical functions. Takač (2008) further identifies several dimensions of vocabulary knowledge: phonological (relating to the science of speech sounds), orthographic, morphological (relating to the structure of words), syntactic, and semantic. Thus, it can be concluded that vocabulary knowledge entails a range of interrelated aspects pertaining to a word. Knowledge in most or all of the above aspects is crucial to be able to become a resourceful communicator (Nation, 1990, 2001; Schmitt, 2000).

General Academic Vocabulary of ESL Students in Postsecondary Education

Vocabulary is considered one of the most important aspects of a language. Commenting on the importance of vocabulary, Wilkins (1972) stated that, “without grammar very little can be conveyed, without vocabulary, nothing can be conveyed” (as cited in Milton, 2009, p. 3). Vocabulary learning is considered a continual learning pursuit and vocabulary knowledge is integral to the development of more complex knowledge. A good lexicon enables learners to access their background knowledge with ease, express ideas, comprehend others, and learn new concepts (Evans & Morrison, 2011; Francis & Armstrong, 2018).

ESL learners in postsecondary programs require advanced language skills to perform daily academic activities. Where vocabulary is concerned, they have to learn general academic words (such as “analyze” and “conclude”) that are common across

academic disciplines; technical words unique to a particular discipline (such as “asymptote” and “biosphere”); and other high-frequency words (such as “in” and “the”), as they are imperative to text comprehension and production (Beck, McKeown, & Kucan, 2002). Moreover, the precise usage of academic vocabulary is considered a mark of intelligence (Corson, 1997). General academic vocabulary is defined as the words that occur across content areas, they are abstract in nature and are considered challenging to master (Harmon & Wood, 2018; Townsend, 2009) as they are not explicitly taught in the classroom.

Hence, in academia, having a robust general academic vocabulary is considered key to students’ educational process (Corson, 1997; Gardner & Davies, 2013; Nagy & Townsend, 2012). Lexical competence is identified as a major component of knowing a language and is a predictor of one’s reading ability (Cobb, 2007; Haynes & Baker, 1993; Francis & Armstrong, 2018; Laufer, 2010; Mehrpour, Rasmjoo, & Kian, 2011; Nation, 2013; Schmitt, 2008; Stahl & Nagy, 2006). For instance, the Lexical Threshold Hypothesis purports that unless a reader comprehends at least 95% of the vocabulary in a text, his/her ability to guess the meanings of other unknown words is severely compromised (Laufer, 1989; Liu & Nation 1985; Nation & Waring, 2004). Thus, to ensure comprehension, a student entering higher education requires knowledge of at least 4,000-5,000 word families (Laufer, 2010; Nation, 2006; Schmitt & Schmitt, 2014). Lexical competence is also “a critical factor in the advancement of powerful reading and critical thinking abilities among adolescents, young adults, and adults” (Farstrup & Samuels, 2008, p. 1). The connection between word knowledge and reading comprehension is such that the slow growth in a student’s vocabulary knowledge directly affects his/her reading comprehension (Chall & Jacobs, 2003). Thus, it can also be

assumed that as reading influences one's writing, inability to comprehend textual content may adversely affect one's ability to write well.

Inadequate vocabulary knowledge contributes to poor writing quality especially for ESL learners in post-secondary education (Astika, 1993). Where the impact of vocabulary on writing is concerned, lexical density (the proportion of content words such as nouns, verbs, adjectives, and adverbs, to the total number of words) is identified as an important criterion for assessing writing performance of students (Nadarajan, 2007).

A lack of lexical density or in other words, lexical ignorance, is a learning barrier for ESL students despite having mastered the phonological code and the grammatical structures of the language of instruction (Coady, 1993, Laufer, 1997; Yang & Dai, 2011). It is inevitable that a student with an inadequate vocabulary lags behind peers with robust vocabularies. In K-12 schools, the former is also at the risk of being identified either as learning disabled (August et al., 2005) or of having shorter attention spans (Ariza, Morales-Jones, Yahya, & Zainuddin, 2002). Also, an inadequate vocabulary thwarts students' ability to freely express themselves in academic discourse. Thus, there is a need to provide learners with strategies to support their vocabulary development so that they reach expected academic standards (August et al., 2005; Nation, 1990; Stahl & Nagy, 2006).

Given that vocabulary knowledge directly correlates with academic literacy and that it is one of the chief obstacles preventing postsecondary students from achieving academic success (Arechiga, 2013), attention needs to be directed toward ESL learners to enhance their vocabulary to improve their academic performance. This is integral as ESL learner graduate students who lack adequate English language skills may be taught by

faculty who may not have the expertise to identify students' language related issues and provide necessary support.

Overcoming Language Learning Challenges

ESL learners use a variety of language learning strategies (LLS) to overcome the challenges they encounter while acquiring a new language (Oxford, 1990). LLS are “steps taken by learners to enhance their own learning” (Oxford, 1990, p. 1). These strategies “aid acquisition, storage, retrieval, and use of information ... [and make learning] easier, faster, more enjoyable, more self-directed, more effective and more transferable to new situations” (Oxford, 1990, p. 8). Frequency and deployment of learning strategies vary according to a person's gender, age, beliefs, and motivation (Macaro, 2001). Additionally, degrees of awareness, expectations of the teacher, stage of learning, task requirements, nationality/ethnicity, general learning preferences, personality traits, and purpose for learning the new language also determine a learner's strategy choice (Oxford, 1990). LLS should be regarded as critically important tools for active self-directed involvement toward ESL learners' successful language acquisition (Takač, 2008). LLS are also essential skills to support less successful language learners in order to improve their language acquisition (Oxford, 1990).

Vocabulary Learning Strategies

VLS are specific LLS, which in turn, constitute one sub-type of general learning strategies (Dóczy, 2011; Nation, 2001). Accordingly, most definitions of VLS reflect their relationship to LLS. For instance, VLS are defined as “actions that learners take to help themselves understand and remember vocabulary” (Cameron, 2001, p. 92). Similarly, Takač (2008) claims that VLS are “specific strategies utilised in the isolated task of learning vocabulary in the target language” (p. 52). She also adds that these strategies can

be used in any other field of language learning. Of particular interest to the current study is how students employ learning strategies in vocabulary learning.

Taxonomies of vocabulary learning strategies. An impressive amount of work has been done in the field of vocabulary learning, resulting in a number of VLS taxonomies (Gu & Johnson, 1996; Nation, 2001; Schmitt, 1997, 2000). Despite minor variations and differences, most taxonomies acknowledge discovery and consolidation strategies and a variety of sub-strategies which fall under these two. Discovery strategies are employed to determine the meaning of an unfamiliar vocabulary item while consolidation strategies are used to consolidate meaning of a word after its initial discovery (Schmitt, 2000).

Strategies belonging to the former include determination strategies such as using dictionaries, guessing meaning from context and analyzing affixes and roots. Social strategies include asking teachers or classmates for synonyms or L1 equivalents. Consolidation strategies include cognitive, metacognitive, memory, and social strategies. Cognitive strategies involve learners making meaning by using their background knowledge. Some of the strategies belonging to this category are verbal and written repetition of words to be learned, making word lists and maintaining vocabulary notebooks. Metacognitive strategies involve a variety of self-initiation strategies and selective awareness strategies such as testing oneself with word tests, skipping or passing a new word, and using English language media. Memory strategies, popularly known as mnemonics, involve associating new language information with familiar concepts already in memory. Using memory strategies entails connecting target words to previous personal experiences, imaging word forms or meaning, using physical actions when learning

words, and connecting a word to its synonyms or antonyms. Using social strategies to consolidate a word once it is encountered entails studying and practicing target words and their meanings with peers and interacting with native speakers (Gu & Johnson, 1996; Schmitt, 1997, 2000).

Critique of existing vocabulary learning strategies. A review of commonly used VLS demonstrates how they predominantly conform to the standards of the Anglo-American, mainstream pedagogical norms. According to Canagarajah (1999), pedagogy of the mainstream often suppresses the learner's emotions, intuitions, and imagination, and as a result, promotes suppression of the learner's prior knowledge (i.e., learner's L1 and culturally relevant knowledge) in the classroom. However, it should be noted that ESL learners bring with them a variety of learning strategies (Beres & Woloshyn, 2017) and that a learning strategy that is considered inappropriate in one learning context, could be regarded quite valuable in another context (Gu, 2003). For instance, O'Malley and Chamot (1990) found that rote repetition is widely used by many Asian students; this strategy is not as common among other students. Thus, when working with different ESL learner populations, educators should not ignore strategies that they have been using in their previous learning contexts.

Given that strategy deployment is determined by learner characteristics, it is imperative that the learner's social, psychological, and cultural background is not ignored when teaching VLS. Specifically, attention needs to be dedicated to the sociocultural characteristics and background of the learner where VLSs are concerned. International students who are new to the host country's language and culture may encounter issues in their new linguistic and cultural environment (Zhang, 2016). For instance, Beres and

Woloshyn (2017) in a study on Chinese International postsecondary students found that their “language difficulties often are compounded by sociocultural factors, resulting in acculturation stress” (p. 730). In congruence with this, Canagarajah (1997) states that ESL students are often required to “master a radically new sociocultural baggage” that comes along with L2 learning (p. 16). These points underscore the significance of the socio-cultural dimension during the language learning process.

Students in general often feel anxious in the presence of an unfamiliar L2 and content in the classroom. The discomfort caused by the presence of an unfamiliar L2, which is identified as language anxiety, is defined as “the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening, and learning” (Onwuegbuzie, Bailey, & Daley, 1999, p. 218). L2 learners can be affected by unequal power relations in the classroom (Peirce, 1995). Practices such as banning the L1 from the ESL pedagogy is a deliberate disregard for the ESL learner’s prior knowledge and this can be disempowering to them. Also, when the L1 is suppressed, L2 learners are deprived of a valuable tool they have at their disposal for language learning. Additionally, culturally unfamiliar concepts and content can also be disconcerting to the students (Alptekin, 1993). For example, the use of certain imagery as a language learning strategy, which Western scholars may find suitable to facilitate vocabulary acquisition, can evoke anxiety in ESL learners (Canagarajah, 1993, 1997, 1999).

Since affective factors such as negative emotions can impact working memory, it is important to rethink the currently used strategies that are aligned with mainstream pedagogical norms. As a bilingual’s linguistic and cultural repertoires do not exist in isolation from each other, it is vital to consider VLSs that recognize, validate, and utilize

both ESL learners' linguistic and cultural knowledge. To accomplish this, first, a judicious critique of existing VLS is necessary. Then, a VLS that integrates ESL learners' cultural capital and existing cognitive resources might be proposed. The aim of the current study was to achieve this purpose. In the next sections, literature discussing the impact of cognitive and socio-cultural elements on vocabulary learning is presented in separate sections.

Impact of Cognitive Architecture on Processing of Vocabulary

As implied by the BDCT (Paivio & Desrochers, 1980), a bilingual's two verbal systems and the image system interact with each other contributing to an understanding of the world at representational, referential, and associative levels. Bilinguals have more than one verbal system in their language repertoire. Hence, it is inevitable that these verbal systems interact with each other in varying degrees when they try to make sense of the world. Paivio (2014) suggests the presence of two languages contributes to the general bilingual intelligence at least partially due to the information presented in two languages, and asserts that dual coding contributes to the picture advantage in recognition memory in any individual. The following section provides a review of the literature that explored the contribution of the unique cognitive architecture of the bilingual to vocabulary development.

It has been documented that a dual processing strategy supports monolingual/bilingual/multilingual individuals to develop "mental pictorial representations of graphic input and mental verbal representations of linguistic input" (Jones, 2004, p. 123). As this construct is pivotal to the current study, it is vital to investigate how this happens. The presence of cues in dual forms has the ability to facilitate learning, as corresponding visual and verbal representations exist in working memory (Farley et al., 2012). This finding confirms the notion that if a new word is manipulated in multiple ways, it will

lead to better retention as there is greater engagement (Craik & Lockhart, 1972; Jones, 2004; Laufer & Shmueli, 1997; Prince, 1996; Ramachandran & Rahim, 2004).

There has been a wealth of literature that examines to what extent the presence of both pictorial and verbal cues enhances vocabulary development. In general, findings reveal that supportive information presented by way of pictorial and verbal cues exerts a positive influence on language learning (Farley et al., 2012; Jones, 2004; Oxford & Crookall, 1990; Paivio, 1971, 2014; Shen, 2010). Where L2 learning is concerned, Paivio (1990) claims that the image system provides an indirect access route from one language to the other. Under some circumstances and for some words, translation can be mediated because a logogen in V1 (L1 Verbal system) activates referential imagens, which in turn activates referential logogens in V2 (L2 Verbal system). This permits the translation equivalent of a target L2 word to be accessed in the ESL learner. Soh (2010) illustrates the process of L1 word acquisition and L2 word acquisition when bilingual coding is and is not applied (refer to Figures 3, 4, & 5). Figure 5 clearly shows the inevitable interaction between these three systems in the bilingual brain, which may facilitate vocabulary acquisition.

Soh (2010) asserts that by using the connection between L1 and L2, acquisition of new vocabulary can be facilitated as this connection enables the translation equivalents in L1 to be accessed. Accordingly, the process of acquiring new words is displayed in Figure 5.

Mnemonics and Imagery-Based Mnemonics

Mnemonics are techniques based on cognitive processes that are used to enhance retention of material that a learner would otherwise forget (Takač, 2008). Mnemonics can be classified into verbal (e.g., reduction, elaborated coding, semantic elaboration, rhyme and rhythm), visual (e.g., imagery, the loci method, method of spatial page organization), and mixed mnemonics (e.g., the Peg/hook Method, the Keyword Method, association

mnemonics, rituals, process mnemonics; Takač, 2008).

Paivio (1983) elaborates on the distinction between mnemonic and non-mnemonic strategies by pointing out that mnemonics include using pictures or images, which transform or physically re-code the material to be learned. The images used usually have no direct relation to the target language units; instead, they only serve as retrieval cues to recall the meanings of those units. Paivio (1983) clarifies that non-mnemonic strategies employ pictures that simply represent, elaborate on, or provide visual interpretations without involving translations connecting to the language material.

Mnemonic strategies are more effective than non-mnemonic strategies for enhancing language acquisition since they demand deeper cognitive involvement (Paivio, 1983; Roediger, 1980; Takač, 2008). Two types of mnemonics are discussed in LLS literature: organizational mnemonics and encoding mnemonics (Bellezza, 1987). Interestingly, both these types utilize symbolizing (Bellezza, 1987), which is one of the main foci of the current study.

Organizational mnemonics organize and interrelate new information in memory so that it can be later recalled (Bellezza, 1987). Examples of organizational mnemonics include methods such as the loci method, peg word/hook method, and story mnemonics. The peg word/hook method, which is a two-stage process, entails learners requiring to learn 10 number-rhyme pairs (e.g., one is a gun, two is a shoe, and three is a tree, etc.) in the first stage. In the second stage, the rhyme mnemonic can be used to remember “a series of items in order by forming an image of the first item and making it interact with a gun, the first peg word. An image of the second item is constructed with it interacting with a shoe, and so on” (Roediger, 1980, p. 559). These pegs or hooks allow the learners to hang on it the words to be recalled. In the loci method, a familiar series of locations is

used to learn a series of new items. In this method, target words are transformed into images and are placed in the various locations. The locations facilitate the recall of the target words. The story mnemonic method involves linking the words to be learned in a story. This is one of the simplest methods, but it is not as widely known as the loci method or the hook method.

Encoding mnemonics, “transform low-imagery, abstract material into more memorable form”, which facilitates easy storage of information in the memory (Bellezza, 1987, p. 35). For instance, Bellezza (1987) illustrates how a low imagery word such as “fiscal” can be transformed into a more memorable form by either utilizing semantic association (e.g., money) or by similar pronunciation (e.g., fish tail). These latter words can be readily visualized and serve as retrieval cues to recall the low imagery, abstract target word. Mnemonics that employ imagery such as forming mental visualizations and making associations between images enhances vocabulary acquisition as there is a connection between the verbal systems and the image systems (Paivio & Desrochers, 1981; Thornburry, 2002). This is key to the current research study as it focuses on how the image system and the verbal systems can be combined to optimize L2 vocabulary acquisition.

Typically, L2 learners use a variety of VLS that include both mnemonic and non-mnemonic strategies in order to enhance vocabulary acquisition (Kafipour & Naveh, 2011; Kafipour, Yazdi, Soori, & Shorkpour, 2011; Nemati, 2009; Tsai & Chang, 2009; Wang, 2004; Wu, 2005; Yang, 2008; Yang & Dai, 2011). It is encouraging to note that there is a positive influence of VLS instruction on the vocabulary acquisition of L2 learners (Baumann et al., 2012; Gu & Johnson, 1996; Kafipour et al., 2011; Rahimy &

Shams, 2012; Wang, 2004). In particular, VLSs that require deep, active manipulation of information (Takač, 2008) and deep semantic processing (O'Malley & Chamot, 1990; Oxford, 1990) result in better retention of vocabulary. This is in congruence with the depth of processing hypothesis (Craik & Lockhart, 1972; Craik & Tulving, 1975) which purports word retrieval is facilitated when cognitive energy is exerted on the manipulation of a word. For instance, shallow processing of a word occurs if the word is processed only at the structural level (i.e., the word's appearance) or at the phonemic level (i.e., the word's sound(s)). This does not contribute much to enhancing vocabulary knowledge as the word is processed only at a superficial level. On the contrary, deep processing of a word entails relating a word to its synonyms, its meaningful analysis and relating it to corresponding images. Thus, according to Craik and Lockhart (1972) and Craik and Tulving (1975), deep processing facilitates recall of words and their meanings. However, not all learners come to the language learning process equipped with deep processing strategies, so instruction on VLSs can expedite L2 vocabulary development. Thus, it is crucial to educate learners on the use of VLS that are meaningful to them as such strategies create opportunities to increase vocabulary acquisition.

In general, in vocabulary strategy instruction, imagery-based mnemonics are considered immensely superior to strategies such as rote translation (Farley et al., 2012; Nemati, 2009; Paivio, 2014; Paivio & Desrochers, 1981). This is mainly due to the facilitative effect, which visual referents can provide, in the retrieval of information pertaining to vocabulary (Farley et al., 2012; Paivio, 2014; Sadoski, 2005; Shen, 2010). In other words, images contain structural messages that supplement the vocabulary presented (Baggett, 1989; Kozma, 1991). Further to this, Paivio (1983) emphasizes the significance of providing appropriate non-verbal, situational, cognitive, and behavioural

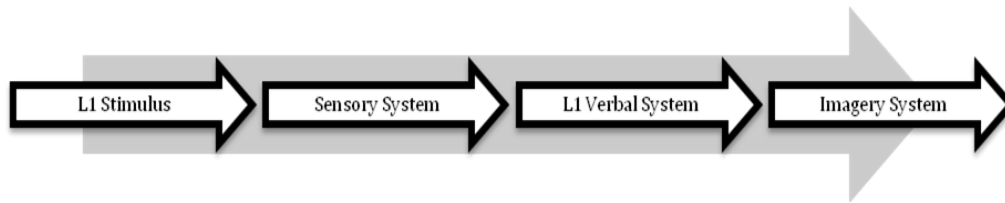


Figure 3. The process of acquiring a word in L1. Adapted from Soh (2010).

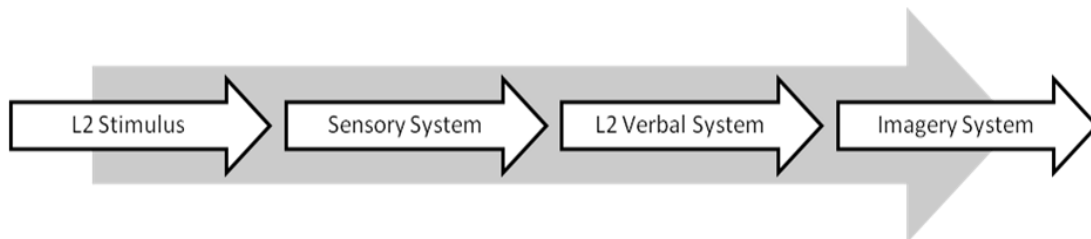


Figure 4. The process of acquiring a word in L2 when bilingual coding is not applied. Adapted from Soh (2010).

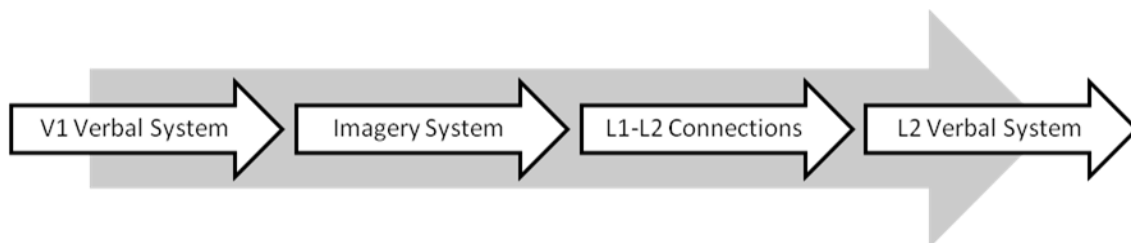


Figure 5. The process of acquiring a word in L2 when bilingual coding is applied. Adapted from Soh (2010).

contexts for using images in language learning.

Clearly, imagery-based mnemonics play a significant role in vocabulary acquisition: they acknowledge and utilize the cognitive architecture of an individual's brain and they demand deeper cognitive involvement leading to stronger memory connections. The current study, recognizing the significance of imagery, aimed at incorporating it into the proposed VLS.

Verbal Systems and Vocabulary Acquisition

Research studies over the past several decades confirm the high levels of connectivity between an individual's L1 and L2 (Arabski, 2006; Cohen & Aphek, 1980; Stern, 1992), underscoring the fact that this connection is “an inevitable fact of life” (Stern, 1992, p. 282). ESL students demonstrate significant levels of both intentional and unintentional reliance on their L1s in L2 learning (Jarvis & Pavlenko, 2008). Given that bilinguals benefit from the two verbal systems that characterize their cognitive architecture, it is worth investigating how the interaction between these two verbal systems contributes to vocabulary development in a subsequent language.

There are distinctions between theoretical interpretations of how verbal systems operate. The BDCT is built on the premise that a bilingual individual possesses two verbal systems; interestingly, translanguaging theory posits that the bilingual possesses one “semiotic system integrating various lexical, morphological, and grammatical linguistic features in addition to social practices and features individuals embody (e.g., their gestures, their posture)” instead of “two interdependent language systems that bilinguals shuttle between” (Vogel & Garcia, 2016, p. 5). Despite these different perspectives, both theories recognize the fact that the bilingual's languages are intricately intertwined.

Jiang (2000) proposes a three-stage psycholinguistic model of adult vocabulary acquisition that underscores the significance of L1. In the first stage, when a new L1 word is acquired, it gets registered in the individual's mental lexicon. This mental entry contains four types of lexical knowledge: meaning, syntax, morphology, and phonology/orthography. When an L2 is learned, the mental entry may contain only phonological/orthographical knowledge while the rest of the space in the entry remains empty. However, the L2 mental entry contains a pointer, which links the new word to its L1 equivalent making lexical processing and production at this stage heavily dependent on L1 translation. This stage is identified as the lexical association stage. In the second stage or the lemma mediation stage, an L2 entry contains L2 form specifications and semantic/syntactic specifications from its L1 translation equivalent. In the third stage, lexical knowledge specific to the new L2 word is integrated in its entry while the L1 information is discarded. However, Jiang (2000) claims that in most cases, words stop short of this third stage and lemma mediation may become a steady state of vocabulary development even in advanced learners. Jiang's (2000) three-stage model can be used to explain ESL students' reliance on L1 specifically in L2 vocabulary learning. These views are echoed by Ellis's (2005) proposal that bilinguals possess a shared conceptual store for the L1 and L2, which shows significant relationships that are non-language specific. Thus, when a bilingual speaker tries to process language, both L1 and L2 lexical items are activated (Macaro, 2009).

Although Jiang's (2000) model explains unintentional reliance on the L1 due to the interconnectedness between the two verbal systems, there are instances that illustrate how the intentional use of L1 in L2 vocabulary learning benefits ESL learners. For

instance, there has been a considerable amount of research investigating the impact of translation in novel word learning (Grace, 1998; Prince, 1996; Ramahandran & Rahim, 2004; Saz, Lin, & Eskenazi, 2014). These studies indicate the cognitive advantages of a bilingual and how these advantages might be capitalized on to develop vocabulary. For instance, “language independence hypothesis of BDCT implies that L1 and L2 translation equivalents should have an additive memory effect for bilinguals such that each bilingual code contributes equally to their additive effects” (Paivio, 2014, p. 50).

Research reveals that learners are able to recall novel words which were coded bilingually twice as well as words coded monolingually as the former are additive in their joint effect on recall (Paivio, 2014). In congruence with this, Jones (2004) found that in terms of production, translation annotations were superior to pictorial annotations. For example, in a study which investigated how pictorial and/or written annotations influence students’ performance on incidental vocabulary learning tests, Jones (2004) found that learners’ ability to accurately and precisely translate L2 words into L1 are affected by the richness of images provided to them as retrieval cues. On the contrary, written annotations were able to provide learners with more specific definitions of the L2 words. Research also highlights that learners show a general tendency to covertly pronounce the labels of the pictures they are presented in their L1 and “the names and the pictures converge on the foreign language response, increasing the probability of recall relative to the word–stimulus condition” (Paivio, 2014, p. 54).

Translation equivalents are a time-effective way of learning the central meaning of a word. This is significant as adult learners are metacognitively aware of when they have or have not understood a particular word meaning. This can easily and effectively be achieved using translation equivalents, for “L1 translation may link a L2 word with

well-established semantic and linguistic structure which helps the learner retain the word better” (Fraser, 1999, p. 238). One traditional way of doing this is by using dictionaries. Many ESL learners depend heavily on different types of dictionaries (e.g., monolingual, bilingual, bilingualized, electronic, and paper-based) to find support for their vocabulary related challenges (Schmitt, 1997; Tsai & Chang, 2009; Wu, 2005; Yang, 2008).

Until recently, it was assumed that monolingual dictionaries were the most effective tool for ESL learners, but these resources are of little value to low proficiency ESL learners (Hartmann, 1991). For example, a study by Laufer and Hadar (1997) compared the effectiveness of monolingual, bilingual, and bilingualized dictionaries in the comprehension and production of new vocabulary words by L2 learners. The study examined the efficacy of these three types of dictionaries in facilitating the comprehension of target words and the learners’ ability to use those words in sentences. The study found that bilingualized dictionaries were better or as good as the other two types in both comprehension and production tasks. They concluded that bilingualized dictionaries are advantageous specifically to low proficiency ESL learners as they offer many meaning options as the dictionary entries contain information in both L1 and L2.

These views highlight the significance of cross-linguistic influences on vocabulary learning and the interplay between the two verbal systems. There is a connection between these two systems as both advanced and low proficient learners inevitably draw from their L1 when learning and using an L2. Reliance on the L1 is sometimes inevitable, firstly because it is part of the bilingual’s cognitive architecture (i.e., the presence of two languages in their language repertoire), and secondly because the bilingual often makes a conscious decision to draw from their L1. An example would be when an individual expresses a preference for a bilingual or bilingualized dictionary over a monolingual one

when meanings of new words are sought. Another example would be when a bilingual shows a tendency to label images in his/her L1 before thinking of the appropriate L2 label. Under these circumstances, it is warranted to acknowledge the influence on vocabulary enhancement, and language educators should look for avenues to judiciously utilize L1 in the L2 vocabulary acquisition process.

An Alternative: Culturally and Cognitively Relevant Vocabulary Learning

Strategies

The review of literature above underscores the need for VLSs that incorporate the ESL learner's socio-cognitive resources. Canagarajah (1997) discusses the significance of a literacy pedagogy that empowers the learner not only pedagogically, but also socially. Very little research has been conducted in this regard perhaps due to the lack of attention given to direct vocabulary teaching, explicit strategy instruction and the role played by prior cultural knowledge in vocabulary learning. The lack of literature can also be attributed to the assumption that learning is a detached cognitive activity devoid of any connection to social context. Cummins (2006) notes that although the construct of identity investment has not been investigated much in the cognitive psychology or educational reform research literature, it has been documented as a significant explanatory construct in educational anthropology and second language acquisition studies. This indicates the need for a more culturally inclusive pedagogy where ESL learners are concerned.

Literate adult language learners approach the task of language learning with a very different set of strategies than those available to pre-linguistic infants (Wells, 1998). Unlike in infants, social cultural factors have a great influence on the success of adult language learners (Norton, 2013; Skilton-Sylvester, 2002). Although children acquire L1

with no formal instruction, it is challenging for an adult to learn a second language without any support or explicit instruction (Gullberg, Roberts, Dimroth, Veroude, & Indefrey, 2010). Thus, it is important to consider the utility of didactic instruction to facilitate independent vocabulary acquisition in adult ESL learners.

Craik and Lockhart's (1972) levels of processing theory asserts that memory benefits when elaboration is used to encode new information. One method of elaborating information is achieved by way of self-reference or thinking about personal associations when novel words are encountered, while another way is to construct images relevant to the new words. Elaboration leads to deep processing of information, and results in retention (Craik, 2002; Craik & Lockhart, 1972; Sokmen, 1997). Thus, it can be concluded that making connections with L1 translation equivalents and familiar images from the learner's culture might facilitate highly relevant personal associations.

Adults' sense of self-identity is inextricably intertwined with their L1; thus, expecting them to ignore this connection could result in them feeling that their sense of identity is being threatened (Cook, 2001; Dailey-O'Cain & Liebscher, 2006; Piasecka, 1986). Adults tend to have an emotional loyalty to their L1, therefore by supporting learning in the L1, teachers are letting learners know that their L1s are valued and respected (Schweers, 1999). In a similar vein, Cummins et al. (2006) assert that English language learners' knowledge about their respective cultures and their language abilities are vital resources in facilitating academic engagement. Instruction needs to affirm their identities and enable them to invest their identities in their learning. Hence, any learning strategy that recognizes this crucial need can exert a positive influence on the learning process.

Research suggests that there are culture specific differences in the nature of images evoked in a bilingual's mind (Jared et al., 2013; Winograd, Cohen, & Barressi, 1976). If the images used in language teaching are unfamiliar to learners, it may negatively influence language acquisition. In a study by Canagarajah (1993,1997) conducted with Sri Lankan Tamil ESL learners, it was found that pro-Western liberal experiences illustrated in language textbooks caused certain distractions to the learners due to the contrast between the two cultures. For instance, during English language lessons, students drew on American characters in Western attire to reflect rural Tamil garb. Canagarajah (1993) cites instances where the learners rejected "the alien discourse behind the language and the textbook" (p. 28). He observed that students penned comments, drawings and paintings in the textbooks during ESL lessons while "passively observing or listening to the teacher" (Canagarajah, 1993, p. 613). Canagarajah (1993) concluded that some of these glosses (e.g., annotations/marginal notes) "seem to seek cultural relevance from the situations and pictures" (p. 613). Canagarajah's work shows the significance of incorporating culturally relevant pedagogy that includes culturally relevant imagery into the language teaching pedagogy.

Thus, it is imperative that the imagery and concepts used as examples in ESL instruction acknowledge this reality and incorporate these culture specific approaches into the ESL pedagogies. This is important because mental images are constructed on the basis of a learner's knowledge of the world in response to cues in the L1 verbal system. VLS such as the keyword method employs L1 key words and visual imagery to create acoustic and semantic links between L2 words and their meanings as represented by familiar translation equivalents or synonyms (Gu & Johnson, 1996; Paivio, 1983).

Research suggests that images that are culturally biased can be labeled considerably faster in culturally congruent languages than in culturally incongruent languages (Jared et al., 2013; Kroll & McClain, 2013; Paivio, 2014; Zhang et al., 2013). For instance, Zhang et al. (2013) found that Chinese-English bilinguals found it challenging to describe culturally specific images from China drawn from their L1 experience in their L2. On the contrary, they were able to describe ordinary American cultural images from their American experience in their L2 with relative ease. These findings are in line with Jared et al.'s (2013) study, which investigated picture-naming abilities of Chinese-English bilinguals in Canada. They too were able to recall culturally specific Chinese images (e.g., the Great Wall of China) in Chinese rather than in English and vice versa.

The above research findings are consistent with the BDCT's claim that "some image representations are more strongly connected to one language than the other" (Paivio, 2014, p. 52). This difference can be attributed to the contexts in which the two languages are learned. For instance, if the two languages were learned in two different countries, referential images would be different for L1 and L2 (Jared et al., 2013). Kroll and McClain (2013) also point out that for a bilingual, concepts may become culturally bound through experience. In the case of the current study, all international students who studied in Anglophone universities in Canada have learned English in their home countries, as they require proof of language ability prior to being accepted in Canadian universities. Thus, it can be assumed some of the concepts they had acquired prior to their arrival in Canada may be bound to their L1 culture than to the Canadian culture.

It is clear that L1 and culturally relevant imagery are integral in the L2 vocabulary learning process. Thus, it is vital to select learning strategies that acknowledge and utilize the ESL learner's socio-cognitive resources during the knowledge production process. Language learning pedagogies need to engage ESL learners to become autonomous as they deploy their prior knowledge to create new word knowledge.

Collaboration and Language Learning

Some of the latest developments in language teaching and learning consider the learner as a social agent (Piccardo et al., 2019), who is actively involved in the knowledge construction process utilizing all resources he/she has. In terms of language learning, Vygotsky's concept of the zone of proximal development brings together "the teacher, the learner, their social and cultural history, their goals and motives, as well as the resources available to them, including those that are dialogically constructed together" (Aljaafreh & Lantolf, 1994, p. 468). Dialogic learning, which is the result of working with other learners, has a positive influence on learning. Piccardo et al. (2019) explain that, under such developments, learning languages moves beyond the acquisition of the four skills (i.e. listening, speaking, reading, writing) and includes "interaction" and "mediation" (p. 18). This notion underscores the importance of collaboration among learners in the context of language acquisition.

It is clear that during language learning, it is not enough to focus solely on concept development, instead, skill-oriented approaches to learner development through meaningful collaboration should also be adopted (Lantolf & Pavlenko, 1995). This is congruent with Lave and Wenger's (1991) concept of communities of practice. Communities of practice can be defined as the process of social learning that takes place

over a period of time between individuals who have similar interests. Thus, collaboration may entail sharing ideas, strategies, and beliefs, determining solutions for common problems and building innovations. In the current study, through collaboration, the ESL learner participants were encouraged to share their socio-cognitive resources (i.e., their L1 and cultural knowledge) in the acquisition of new vocabulary words.

Although there is a plethora of research studies on the merits of collaboration during learning, in certain cultures, learners prefer to work on their own. For instance, Chinese international graduate students in Canada showed discomfort when instructed to adopt learner-centered teaching approaches such as small group discussions (Beres & Woloshyn, 2017). Beres and Woloshyn (2017) concluded that certain teaching/learning methodologies that may be effective in a Western classroom might cause anxiety to international students.

As it relates to the current study, the ESL learners' prior knowledge and experience were honoured during the learning process, as their interpretations of the world are often different to that of other monolinguals. This study explored how learners develop language skills (i.e., VLS) that support concept development in their academic work through collaborating with their peers. Again, it should be noted that the researcher was not an active participant in this collaboration as she did not speak any of the L1s of the participants. The researcher intended for the participants to co-construct language learning among themselves as participants.

Chapter Summary

This chapter presented the literature related to vocabulary issues encountered by ESL learners in Anglophone universities. The chapter commenced with a general

introduction to challenges of ESL learners who are attempting to use their linguistic and cultural resources. Then there was an identification of vocabulary as a key area that often poses insurmountable difficulties to this student population. There was a discussion of the strategies used by these learners to overcome the challenges they encounter in language learning and the problems associated with vocabulary learning strategies. Next, there was a presentation of how the ESL learners' socio-cognitive resources can be utilized to develop strategies to enhance general academic vocabulary, which is crucial for their academic development. In this chapter, there was also a discussion of how ESL learners may use their L1 and culturally relevant visuals to enhance vocabulary acquisition in collaboration with other language learners.

CHAPTER THREE: METHODOLOGY AND RESEARCH DESIGN

This chapter presents a description of the research methodology and design that were employed to carry out the current research study. A pilot study guided the development of the research design. This chapter also includes a brief description of the participants and the research site, data collection methods, data analysis, and methodological assumptions. There is also a discussion of how the credibility of the study was established, limitations of the study, and ethical considerations.

The purpose of this study was to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. Based on the use of L1 and culturally relevant images which drew on participants' prior knowledge, the researcher investigated the potential of a vocabulary learning strategy (VLS) that honours the socio-cognitive resources of the bilingual to enhance meaningful, general academic vocabulary acquisition. This research study was conducted using mixed method strategy and thus, drew on both quantitative and qualitative data collection methods.

Research Objectives

The study aimed to achieve the following objectives:

1. To find out whether ESL learner graduate students, either consciously or unconsciously, favour VLS that draw from their culturally relevant knowledge.
2. To find out how effective the combination of L1 and culturally relevant imagery is in facilitating the encoding and retrieval of general academic vocabulary in ESL learner graduate students.
3. To explore whether the combination of ESL learner graduate students' L1 and

culturally relevant imagery can provide them with an effective vocabulary enhancement tool in acquiring general academic vocabulary in a collaborative social learning setting.

Research Questions

The current study sought to answer the following questions in order to achieve the above objectives:

1. Research Question 1:
 - (a) What are the vocabulary learning strategies currently popular among ESL learner graduate students?
 - (b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilise their culturally relevant prior knowledge?
2. Research Question 2: To what extent does culturally relevant knowledge facilitate deep processing and retrieval of new vocabulary words in ESL learner graduate students?
3. Research Question 3: What are the experiences of ESL learner graduate students in using culturally relevant knowledge as a vocabulary learning strategy in a collaborative learning setting?

It should be made clear that the investigation of Research Question 1 occurred for a large sample of ESL learner graduate students using quantitative data collection methods. Then there was a focus on a sub-sample of these ESL learner graduate students and Research Questions 2 and 3 were investigated predominantly using qualitative data collection methods. Specifically, the first research objective sought to find out whether ESL learner graduate students, in general, either intentionally or unintentionally, favour VLSs that utilize their socio-cognitive resources. This was explored both quantitatively in Phase 1

using a survey with a large sample and qualitatively in Phase 2 with a small sub-sample using a semi-structured interview protocol. The second research objective was to find out how effective the use of culturally relevant knowledge is in facilitating retrieval of general academic vocabulary in ESL learner graduate students. This too was investigated both quantitatively and qualitatively through Research Question 2 using delayed and immediate recall vocabulary tests and a semi-structured interview protocol. The third research objective aimed to find out whether ESL learner graduate students' culturally relevant knowledge can serve as a vocabulary enhancement tool to facilitate general academic vocabulary acquisition in a collaborative learning setting. This too was explored both qualitatively and quantitatively through Research Question 3 using a survey and a semi-structured interview protocol.

Research Methodology and Design

As stated above, this study employed mixed methods research to investigate ESL learner graduate students' favoured VLS and how they collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. It is important to note that the quantitative elements of the study fulfilled two functions: to collect information regarding ESL learners' current VLS use and beliefs regarding vocabulary (i.e., Research Question 1) and then to identify potential participants for the qualitatively dominant second phase of the research. These quantitative elements inform the qualitative methodology. The current research study is more qualitative dominant (i.e., Research Questions 2 and 3) as it sought to explore the feasibility of a VLS that utilizes the ESL learners' socio-cognitive resources in their general academic vocabulary development through an investigation of the entire collaborative process.

In general, mixed methods designs draw on both quantitative and qualitative data collection methods to answer a particular research question or a set of questions (Hesse-Biber, 2010; Kitchenham, 2010). As stated by Hanson, Creswell, Plano Clark, Petska, and Creswell (2005), mixed method research “involve[s] the collection, analysis, and integration of quantitative and qualitative data in a single or multiphase study (p. 224). With mixed method design, it is possible to “add meaning to numbers” by using, “words, pictures and narratives” (Johnson & Onwuegbuzie, 2004, p. 21). This enhances the generalizability of the findings for future studies (Hesse-Biber, 2010).

This study employed a sequential explanatory mixed method (Creswell & Plano Clark, 2011) strategy. A sequential explanatory strategy allowed for the qualitative results to assist in further explaining and interpreting quantitative results. Figure 6 illustrates the sequential explanatory strategy, while Figure 7 provides a more detailed depiction of sequential explanatory strategy outlining what is entailed in each step of the research process. Creswell and Plano Clark (2011) describe sequential explanatory design as a research design that consists of an initial quantitative data collection stage followed by a qualitative data collection stage. The purpose of the second stage is to explain or elaborate on the quantitative outcomes. Creswell and Plano Clark (2011) note that the sequential explanatory approach is very popular among educational researchers.

Through the sequential explanatory mixed method strategy, a general picture of the research problem is first provided using quantitative data; then the research problem is further analysed, refined, and extended through qualitative data. For the current study, quantitative methods were employed to gain a comprehensive picture of VLS use among ESL learner graduate students. Data regarding general VLS use were garnered from a large sample of ESL learner graduate students.

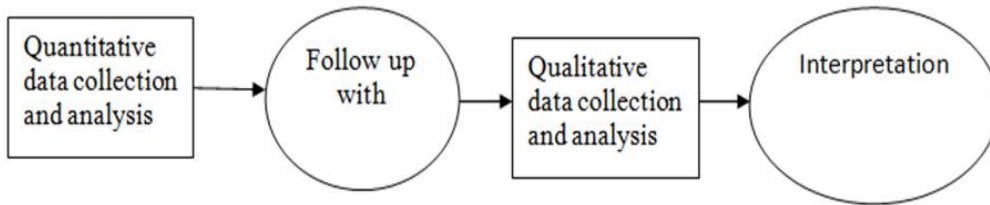


Figure 6. Visual depiction of sequential explanatory strategy.

Phase	Procedure	Product
Quantitative Data Collection	Cross sectional survey	Numeric data
↓		
Quantitative Data Analysis	Use of descriptive and inferential statistics	Meaningful measures
↓		
Connecting Quantitative and qualitative Phase	Selection of participants purposefully and interview questions development	Interview protocol
↓		
Qualitative Data Collection	In- depth interview	Textual data
↓		
Qualitative Data Analysis	Coding and thematic analysis Theme development cross thematic analysis	Codes and themes similar and different themes and categories cross thematic matrix
↓		
Integration of the Quantitative and Qualitative results	Interpretation and explanation of the quantitative and qualitative result	discussion implication future research

Figure 7. Visual depiction of the application of sequential explanatory research strategy.

There was then a focus on a sub-sample to collect more detailed information on the use of L1 and CRI as a VLS. In addition, there was a focus on respondents' views on collaboration during the application phase of the VLS as they used culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. It is integral to note that the sub-sample of ESL learner graduate students were the focus of this research project. Even though a large sample of ESL learner graduate students were surveyed to answer Research Question 1, the quantitative and qualitative data gathered from the sub-sample of ESL learner graduate students mainly informed the responses to all of the research questions.

The qualitative approach within the sequential explanatory mixed method strategy was a case study approach. A case study can be used in exploratory, descriptive, or explanatory studies due to its ability to answer “why” and “how” questions (Rowley, 2002). In the current research, a case study explored the use of VLS in its context and described the effects of such strategies on vocabulary learning. Rowley (2002) suggests that case studies may offer insights that might not be achieved with other approaches and that it is, “one approach that supports deeper and more detailed investigation of the type that is normally necessary to answer how and why questions” (p. 17). Savin-Baden and Major (2013) identify a case study as a flexible, thorough, responsive, and appealing method of inquiry, which allows for depth of investigation of the phenomenon being studied. Yin (2009) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; in a similar vein, Merriam (1998) defines it as “an examination of a specific phenomenon” (p. 9). Since the current study sought to investigate how the learners' existing socio-cognitive resources can be utilized to improve general academic vocabulary, using a case study can be considered both

relevant and appropriate. Through this methodological application, the current study sought a thorough understanding of how culturally relevant knowledge impacts vocabulary acquisition in ESL learner graduate students. In other words, it looked to identify whether the participants favour or prefer strategies that utilize their socio-cognitive resources in acquiring new vocabulary items.

Case study research can be subsumed within mixed methods research.

Kitchenham (2010), elaborating on the reasons why mixed methods research works well for case studies states “case study research lends itself particularly well to mixed methods research, as myriad approaches to research design, analysis, and interpretation are possible” (p. 2). He further claims that case study research enables researchers to apply the data yielded to quantitative and qualitative methods, which enables qualitative data to be quantized and quantitative data to be “qualitized.” This, in turn, enables extracting “meaning from the data sets that might otherwise be hidden” (Kitchenham, 2010, p. 2). It should be noted that this current research study is predominantly qualitative and centred on the case study.

Pilot Study

A pilot study was conducted during May 2013 (REB 14-081 GALLAGHER). The researcher worked with five elementary school English Language Learners to explore the extent to which their use of VLSs helped them internalize mathematical vocabulary. In this study, the researcher taught them a variety of VLS outlined in Schmitt’s (1997) VLS taxonomy. These students had difficulty remembering mathematical vocabulary, and hence, the researcher’s task was to equip them with a variety of cognitive, memory, social, and metacognitive strategies so that they would have a repertoire of strategies to draw from when new mathematical words were encountered.

Although this pilot study sample was elementary school learners, the researcher was able to further develop the research methodology for the current research study in a variety of ways. For instance, the pilot study helped the researcher realize that these learners preferred memory strategies to other strategies. Specifically, they were in favour of more imagery-based strategies rather than other mnemonics. Although the sample populations of the two studies were different in terms of age, the conclusions drawn from the pilot study were utilized as a point of departure for the current study. Thus, the current study also focused on imagery-based mnemonics. It was also effective to give the learner autonomy in terms of strategy selection, instead of instructing learners on what strategy to select. Another important finding was that irrespective of what was taught, learners opted for strategies that complemented their individual learning preferences.

During this pilot study, the researcher had one-on-one sessions with these learners to guide them to find strategies to decode vocabulary words that challenged them. The researcher found the metacognitive discussions with the participants quite useful in finding out why learners prefer one strategy to another. The researcher also noted that it would have been more helpful if the learners had worked with each other as this might enable the generation of more ideas and images. Thus, in the current study, participant collaboration was promoted to determine translation equivalents and imagery for the new words they were required to learn.

Given that the pilot study adopted a qualitative research design with a small number of participants, the generalizability of the findings was limited to a certain extent. In order to expand on the pilot study methodology, the current study uses a mixed methods strategy with a larger sample of ESL graduate students. With the addition of

findings based on quantitative data, there was the opportunity to conduct an in-depth analysis of VLS use while collecting rich descriptive qualitative data.

Present Study: Selection of Site and Participants

The postsecondary institution where the research took place has a considerable number of international students both in its undergraduate and graduate programs. According to statistics, there were 595 international graduate students registered for the academic year 2016-2017 (Brock University, 2017b).

For this graduate population, in most of their native countries, English is spoken as a foreign language. As a result, some of them enter the program with minimum academic language skills. Although there is an English language requirement for prospective students, and the students have met this requirement, they still struggle to overcome language difficulties they encounter in their daily academic activities. The university offers a variety of ESL courses to help students overcome these language related challenges; however, most of these courses give little attention to vocabulary as there are other cognitive academic language skills that need to be developed in these students within the short period of time that is allocated for language courses. Hence, this study focused on developing a VLS to enhance general academic vocabulary proficiency in ESL learner graduate students.

An initial questionnaire (see Appendix A and description below under the heading, “Instrumentation”) was administered to all the international students registered for graduate programs in Fall 2016 (N=595) through the Brock University International Services, and 41 responded. This questionnaire was administered to learn more about the general VLS use and also to find out whether there is a tendency among the respondents

to favour VLSs that utilize their culturally relevant knowledge. There were also demographic questions in the questionnaire that asked respondents to self-identify their L1. This information was used to delineate potential participants speaking the same L1 that would be interested in the intervention phase of the study. Based on the findings from these demographic questions, 11 participants were emailed regarding potential participation in the purposive sub-sample; nine participants opted to continue to the intervention phase.

Intervention Participants

The intervention phase included nine ESL graduate students, who self-identified as ESL learners, pursuing their graduate studies in Education, Sciences, and Business Studies and Accounting. Four of them spoke Arabic as their L1; three others, Chinese and the other two, Russian. There were two male students and the rest were females. The four Arabic L1 speakers were subdivided into two pairs, as there was one female participant who did not wish to work with males. Thus, there were four groups of participants speaking three different L1s. All except one was relatively new to the Canadian system of education and the language of instruction. Given below are the profiles of each participant along with the pseudonyms assigned to them

Chinese L1 Speakers

Xiaoli. Xiaoli is a female international graduate student from China, whose L1 is Chinese/Mandarin. She was in her first year, pursuing a Master's degree in Accounting. Prior to her arrival in Canada, all her education had been conducted in her L1. She rated her level of language competence needed for academic activities as "fair." She also found academic vocabulary an area that is difficult to master

Mei. Mei's profile is also quite similar to that of Xiaoli. The only difference observed between them was that Mei found academic vocabulary to be of "medium" difficulty to master.

Xia. Xia is another female graduate student from China, who was also in the same program as Xiaoli and Mei. However, contrary to the other two participants from China, Xia had had her elementary, secondary, and postsecondary education in English. Despite her years of exposure to English language instruction in school, she found her level of English competence required in the Canadian postsecondary classroom to be "fair." As she believed mastering academic vocabulary a difficult task, she had selected Accounting, as she perceived that this field of study would have relatively less writing.

Arabic L1 Speakers: Group A

Safiya. Safiya is another female participant who was of Libyan origin. She spoke Arabic as her L1 and was a graduate student in the Faculty of Mathematics and Sciences. Her prior education was conducted entirely in Arabic. She considered her level of English competence to be "good," and found academic vocabulary medium difficult to master.

Ahmed. Ahmed, one of the two male participants of the study, is a student pursuing his postsecondary education in the Faculty of Mathematics and Sciences. He is also from Libya and spoke Arabic as his L1. He considered his language competence "fair" and academic vocabulary, somewhat challenging.

Arabic L1 Speakers: Group B

Nadia. Nadia is a female graduate student from Libya, who spoke Arabic as her L1. She was pursuing her postsecondary studies in the Faculty of Mathematics and Sciences. Similar to most of the other participants, she had had her elementary,

secondary, and postsecondary education in Arabic. She considered her language competence “fair” and mastering vocabulary, a difficult task.

Lina. Lina is an Arabic L1 speaker from Libya in the Faculty of Mathematics and Sciences. Her education prior to coming to Canada was in Arabic. She considered her level of English competence “good”, yet found mastering academic vocabulary a challenging task.

Russian L1 Speakers

Tamryn. Tamryn was the only other male participant. He was a graduate student in the Faculty of Education. He was originally from Ukraine and spoke Russian as his L1. He considered English to be his third language as he had his prior education in both Russian and Chinese. He believed his academic English skills are “good,” but found academic vocabulary somewhat challenging to learn.

Ksana. Ksana is the other participant from Ukraine. She too spoke Russian as her L1 and found her academic English language skills to be good. Like Tamryn, she too found academic vocabulary “medium” difficult to master. Ksana was also pursuing her graduate studies in the Faculty of Education.

Table 1 presents a summary of the participant profiles, including their perceptions of their English language skills and vocabulary.

Research Site

The research study took place at a medium-sized university in Ontario, Canada, during the academic year 2016-2017. For the intervention phase of the research there were small group sessions. The interviews with the participants were conducted in two private meeting rooms located in the faculty of education. The duration of the study ran from October 2016 to May 2017.

Table 1

Participant Profiles

Name	Country of origin	First Language	Faculty	Discipline	Perception English competence	Perceptions about vocabulary Academic	Prior learning experiences
Mei	China	Mandarin	Business	Accounting	fair	difficult	Mandarin
Xia	China	Mandarin	Business	Accounting	fair	medium difficulty	Mandarin
Xiaoli	China	Mandarin	Business	Accounting	Fair	Difficult	English
Nadia	Libya	Arabic	Math& Science	Biology	fair	difficult	Arabic
Lina	Libya	Arabic	Math & Science	Biology	Fair	Difficult	Arabic
Safiya	Libya	Arabic	Math & Sciences	Physics	fair	medium difficulty	Arabic
Ahmed	Libya	Arabic	Math & Sciences	Physics	good	medium difficulty	Arabic
Tamryn	Ukraine	Russian	Education	Education	good	medium difficulty	Russian & Mandarin
Ksana	Ukraine	Russian	Education	Education	good	medium difficulty to master	Russian

Intervention

There were six intervention sessions (four instructional sessions followed by two assessment sessions). During the sessions, only the researcher and the participants were present in the meeting room. Each group was assigned different meeting days in order to ensure a quiet environment conducive to discussion. The researcher did not participate in the discussions and functioned only as a facilitator and observer taking notes. The participants were encouraged to seek clarifications from the researcher regarding the intervention procedure.

Intervention began with each group identifying a list of unfamiliar English general academic words (between 20 to 25) from Coxhead's (2000) Academic Word List that were appropriate to their discipline learning needs. The words were familiar to the participants; however, the word meanings were unfamiliar to them. Once the target words were identified, the participants were instructed to think of L1 translation equivalents and imagery drawn from their cultural backgrounds to help them encode the new English words. In order to explain what culturally relevant images are, the participants were shown a brief PowerPoint presentation defining culturally relevant images and providing generic examples. The PowerPoint presentation aimed to make the participants aware of how imagery and translation equivalents can help them learn new vocabulary. The presentation contained examples of a few general academic vocabulary words and images that serve as retrieval cues. For example, as a retrieval cue for the word "abandon," the image of a newborn baby in a basinet at the doorstep of a house was used. This particular image was used in order to show the relevance it has to the Western culture. For each group, there was then a brief discussion about how this image could have been different in other cultures. This helped participants realize what is meant by a culturally relevant

image. The participants were specifically told that they need not think of images to represent or illustrate the idea of the target words in typical Western culture, and to choose an image that may help them make connections between the target word and its meaning.

One of the main goals of the intervention sessions was to have the participants establish L1 equivalents to the target words and create images that would represent the meaning of the target words. These images would serve as retrieval cues that would help the participants recall their meanings. The purpose of this task was to enable referential connections between Verbal System 1 (V1—participants' L1) and Verbal System 2 (V2—English) and the verbal system(s) and the image system (refer to Figure 2).

Participants were encouraged to collaborate with their same L1 speaking group members throughout the process to determine translation equivalents and to create imagery. The researcher was present during the entire process and offered help when requested. As stated earlier, the researcher's role was mainly limited to that of an observer as almost all conversations were carried out in the participants' L1. It should be noted that this was anticipated by the researcher as switching to L1 is a common occurrence among ESL learners in the classroom. The participants were given the freedom to use any type of dictionaries (bilingual, online, paper-based, etc.) and/or translators to determine translation equivalents for the new words they selected.

Overall, the entire intervention process was conducted in six sessions (four instructional and two assessment sessions) in a quiet meeting room, where only participants in the same group were allowed at any given time. There were four 45-minute sessions during which participants worked collaboratively to discuss L1

translation equivalents and create visuals to represent five or six new, general academic vocabulary words. Materials such as paper and pencils were provided. Descriptions of the translated visuals were captured as a form of data. All the conversations during intervention sessions were also audio recorded. By the end of the study, participants had been exposed to between 20-25 new vocabulary items. These vocabulary words were then included as question items for the Immediate and Delayed Recall tests (described below in “Instrumentation”). It should be noted that there were no material incentives provided to the participants. They showed willingness to participate in the study as they all perceived it to be an excellent opportunity to find a solution to one of the major challenges they encounter in their studies—enhancing vocabulary.

Instrumentation

Four forms of instrumentation were used for this study. The *Vocabulary Learning Strategy Questionnaire* (VLSQ) and the Immediate and Delayed Recall Tests served as the quantitative data collection instruments for the study. Qualitative data collection instruments included a participant observation checklist and an interview protocol.

Vocabulary Learning Strategy Questionnaire

Before establishing new strategies, it was imperative to explore the current strategy use and the general perception of students regarding the use of L1 and imagery in encoding new words. In order to do so, the VLSQ (Gu, 2005; Gu & Johnson, 1996) was used. Table 2 presents a summary of the types of strategies contained in Gu and Johnson’s VLSQ. This questionnaire has been used widely in VLS research. The original version of the VLSQ contains 108 items (17 items on beliefs and 91 items on strategies) and has been revised in order to better suit the purpose of the current study (see Appendix

A). The current version captures information regarding the students' beliefs on L1 use and imagery use in greater depth than the original version. Further, the researcher-adapted version of the VLSQ also includes questions to document students' views on the usefulness of collaboration in VLS construction (as this was a focus of the current research). It should be noted that the number of strategies in the original questionnaire was reduced to 44 to make it a more manageable number.

The VLSQ used in this study included three sections: (a) seven question items regarding demographic information and previous language-learning experience of the participants; (b) 18 question items on participants' beliefs about the nature of vocabulary learning rated on a 5-point Likert scale (1=strongly disagree, to 5=strongly agree); and (c) 44 question items that self-assessed VLS use rating each strategy statement on a 5-point Likert scale (1=I never do that, to 5=I always do that). Most importantly, this researcher-adapted VLSQ aimed to determine patterns in the participants' preferences on strategy use and whether they show a preference towards the use of L1 and imagery-based strategies.

The first two sections, which contained demographic questions and beliefs on vocabulary learning, were relatively brief. The demographic section of the questionnaire aimed to find out information about participants' current study programs, their language use prior to coming to Canada and their own evaluation regarding their level of L2 competence. In the next section, there were questions on the participants' beliefs regarding VLS use, how vocabulary should be learned, their level of motivation in learning vocabulary, and their use of culturally relevant knowledge. Altogether, there were 18 items in the section on beliefs.

Table 2

Summary of Gu and Johnson's (1996) VLS taxonomy.

Metacognitive	Cognitive	Memory	Activation
Selective attention: Identifying essential words for comprehension	Guessing: Activating background knowledge, using linguistic items	Rehearsal: Word lists, repetition, etc. Encoding: Association (imagery, visual, auditory, etc.)	Using new words in different contexts
Self-initiation: Using a variety of means to make the meaning of words clear	Use of dictionaries Note taking		

The third section included 44 question items on strategy use: eight rehearsal strategies, 17 encoding strategies, four dictionary strategies, two note-taking strategies, two guessing strategies, two activation strategies, four technology-based strategies, two affective strategies, and three social strategies. The rehearsal strategy category included three subcategories: using word lists, oral repetition, and written repetition. The encoding strategy category contained six subcategories: associations, imagery, visual encoding, semantic encoding, contextual encoding, and word structure. These subcategories were not noted on the participants' version of the questionnaire. The reliability analysis conducted to measure the internal consistency of the VLSQ was very high for the vocabulary learning strategy use section (Section 3). Cronbach's alpha coefficient was used as the indicator of internal consistency and it was found that Cronbach's alpha value for the questionnaire is 0.911. This is extremely significant, as a value above 0.8 would indicate high degree of reliability.

This questionnaire was sent to all international students who were registered for graduate programs during Fall, 2016 term. The purpose of administering the questionnaire to a large sample of participants was twofold: to garner a general idea of the VLS that were being used by ESL graduate student learners in order to create the intervention and to recruit potential participants for the intervention.

Immediate and Delayed Recall Tests

The Immediate and Delayed Recall Tests were administered to the intervention participants to assess the participants' ability to recall meanings of words in Coxhead's (2000) Academic Word List acquired using their socio-cognitive resources (i.e., their L1 and culturally relevant imagery). After the four intervention sessions, once the initial encoding of words was accomplished, the participants were tested twice (for short-term

recall and long-term recall) to determine if/how they retrieved the meanings of the words they had encoded. The tests were designed by the researcher in such a way that the participants found it difficult to use contextual clues to guess the meanings of the words.

The Immediate Recall Test included 15 multiple-choice question items. For each question item, the participants were expected to complete an omission in a sentence by choosing the most appropriate answer from four choices. The L1 translation equivalent and the corresponding image were given immediately after each sentence as a retrieval cue. For short-term recall, the Immediate Recall Test (see Appendix B) was administered on Day 5 of the intervention, which was immediately after the translations and the relevant images were completed for all words.

The Delayed Recall Test 1 was a cloze test that contained 10 words from the multiple-choice questions, where the participants were required to recall both the word and its meaning to fill in the blanks. The Delayed Recall Test 2 was a repetition of Immediate Recall Test. Both Delayed Recall Tests 1 and 2 were administered 2 weeks after the Immediate Recall Test on Day 6 of the intervention.

Participant Observation Checklist

A researcher-developed Participant Observation Checklist (see Appendix C) was used to record both the verbal and non-verbal behaviours of the participants during the four intervention sessions. A 5-point Likert scale (1= never, to 5=always) was used to rate each participant's behaviours at five intervals (each 5 minutes in duration). The researcher observed and recorded how engaged each participant was during 25 minutes of the collaborative activities.

Interview Protocol

Participants were interviewed at the end of the study using the Interview Protocol

(see Appendix D), which allowed them to share their views on the entire process. The interview protocol was guided by background information gleaned from the literature review and the foci of the research questions. Background literature was reviewed before formulating the interview questions to develop questions that were grounded in the literature; in this way, the research questions align with the literature review. The interview questions were also designed to elicit answers pertaining to the research questions. This verification process enabled the researcher to formulate interview questions that were unique and not addressed by previous studies.

Interviews were conducted one-on-one in a private location and were approximately between 30-45 minutes in duration. The audio-recorded interviews were transcribed by the researcher. These semi-structured interview questions sought to garner the participants' perceptions regarding the use of culturally relevant knowledge (L1 and familiar imagery from their respective cultural contexts) and the effectiveness of collaboration in the construction of new vocabulary knowledge. In the semi-structured interviews, the participants were provided with the liberty to describe how they perceived the feasibility of a VLS that utilizes their existing socio-cognitive resources. During the interviews, participants were also given the opportunity to elaborate on their views regarding vocabulary, VLS use, their beliefs regarding VLS use, using L1 and culturally relevant imagery as strategies and collaboration.

Data Collection, Recording, and Analysis

All of the data collection took place on the university campus where the participants attended. Administration of the questionnaire to the large participant pool was online; by contrast, all data (e.g., vocabulary tests, observation checklists, discussions, interviews) collected from the nine participants were collected in a small

meeting room. Upon completion of data collection, each of the nine intervention participants was assigned a pseudonym to protect participant confidentiality.

Quantitative Data Collection

Vocabulary learning strategy questionnaire and vocabulary tests. During the first phase of the study, quantitative data were collected with the VLSQ administered to 41 ESL graduate students in various faculties (Education, Humanities, Mathematics and Science, Business) in the Fall of 2016. Questionnaires are useful to provide evidence of patterns amongst large populations (Kendall, 2008). As the researcher aimed to explore the general perceptions regarding VLS use in a large ESL graduate population, questionnaires were an appropriate choice as a data collection tool. These data were culled into a spreadsheet for analyses.

The vocabulary tests (Immediate and Delayed), which were held on Day Five and Day Six of the intervention, also generated raw scores that were culled into a spreadsheet for analyses. The vocabulary tests were administered only to the nine intervention participants. The analyses conducted were descriptive and were used only to support the qualitative data.

Qualitative Data Collection

Semi-structured interviews. Interviews are considered a common data collection method in qualitative research. Interview is a method that allows the researcher to obtain complex, in-depth information from participants (Wengraf, 2001). Studies that adopt a social constructivist worldview should ideally use open-ended questions in order to obtain participants' views. The nine participants who completed the intervention sessions were interviewed once. The interviews were conducted one-on-one in private meeting rooms at times that were convenient to the participants. In order to maintain

confidentiality, no outsiders were allowed inside the meeting room during the interview. The interviews varied in length between 30–45 minutes. Interviews were conducted, audio recorded using two audio recorders, and transcribed by the researcher. The transcribed interviews were sent to each of the participants for member checking and ensure accuracy.

Observation. Marshall and Rossman (1995) propose that observation involves “the systematic description of events, behaviours, and artefacts in the social setting chosen for study” (p. 79). It also helps researchers understand how individuals construct their realities of a particular phenomenon and provide them with a source of questions to be asked from the participants (Savin-Baden & Major, 2012). In congruence with this, the current study employed direct observation as a data collection method. It helps the researcher document how the participants interacted as they used their culturally relevant knowledge to generate translation equivalents and images to encode general academic vocabulary. This was documented on the Participant Observation Checklist with open-ended comments made by the researcher.

Further, the researcher also noted general observations (on the same Checklist in the section on the bottom) of non-verbal expressions, interactional behaviours within a group and the time that participants spent on certain tasks. This procedure is considered a good data collection approach especially when cross-checking what participants say is consistent with what they do (Savin-Baden & Major, 2012).

Participants’ Discussions. During the intervention sessions, participants’ discussions were audio recorded using two audio recorders. These audio recordings were then transcribed. All of the L1 discussions were translated into English using professional

translators. The translated and transcribed interviews were sent to the participants for member checking and to verify accuracy. The final transcript of the participants' discussions was entirely in English and this was what the researcher used for subsequent analysis. In total, there were 16 audio recordings of participants' discussions varying in duration of 40–60 minutes each.

Summary of the Research Process

With reference to Figure 8, the study included the following processes: (a) administration of the *Vocabulary Learning Strategy Questionnaire* (VLSQ) to collect information regarding 41 ESL graduate students' VLS use and beliefs; (b) an intervention with nine ESL learner graduate students, where L1 meanings of a list of high frequency general academic vocabulary words were determined and imagery to represent them were designed—audio recording of their discussions and observations were conducted simultaneously to obtain information regarding this process and administration of vocabulary tests (Immediate and Delayed) to gauge the nine participants' ability to recall the meanings of words acquired by way of using culturally relevant knowledge (c) concluding interviews.

Data Analysis Procedure

In this mixed methods study, both quantitative and qualitative data were analyzed in response to the research outcomes and research questions. Figure 9 is a visual depiction of the data analysis procedure and connection to the theoretical frameworks. It is important to note that both quantitative and qualitative data were used to answer each of the three research questions.

The quantitative questionnaire data were analyzed using both descriptive and

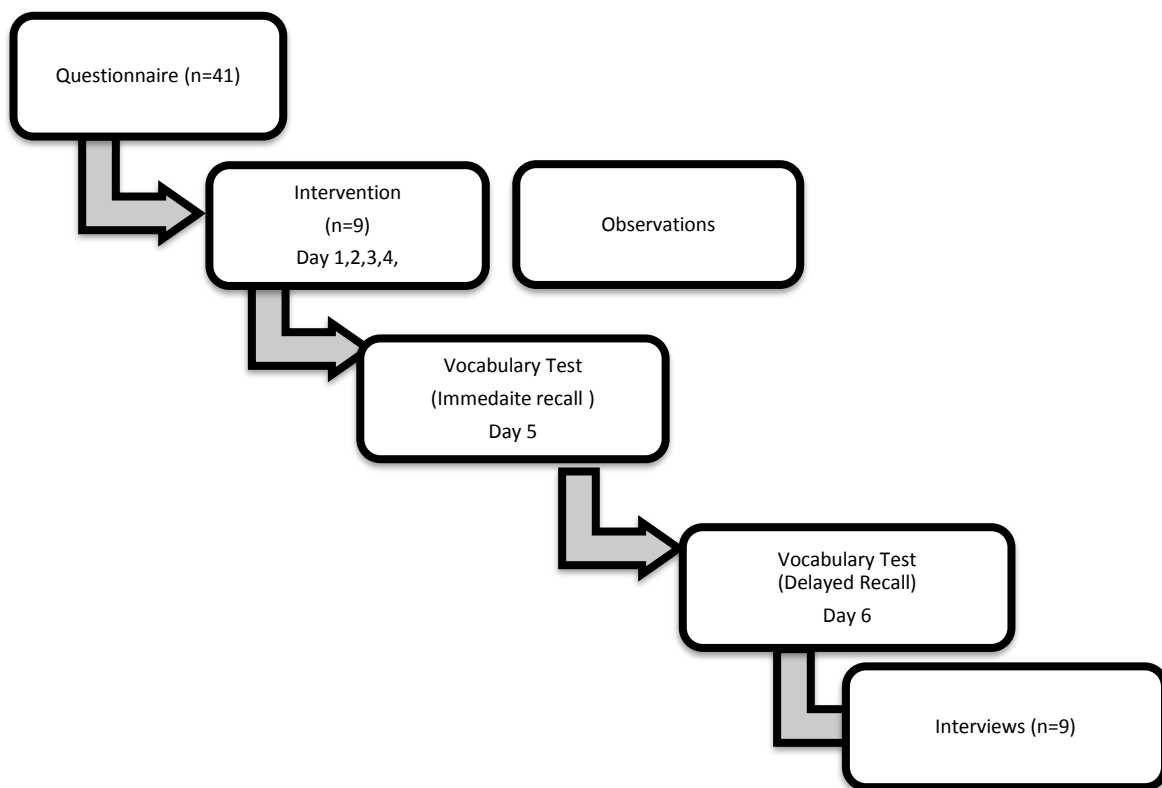


Figure 8. Visual depiction of the research process.

inferential statistics while the quantitative test scores (Immediate and Delayed Recall) were analyzed only using descriptive statistics. In order to do this, the researcher used *Statistical Package for Social Sciences* (SPSS 24). The quantitative data derived from the VLSQ were used to describe the general preferences of VLS use and beliefs about vocabulary learning among a general sample of participants. The data from the questionnaire were also used to determine whether there was a tendency among participants to use more L1 based and imagery-based strategies. The analysis aimed to find out whether the participants who believed in the efficacy of L1 and imagery, actually favored strategies based on them, and whether there is a correlation between their beliefs and strategy use. The analyses employed the Chi-square Test of Independence and Spearman's Rank-Order Correlation.

In addition to questionnaire data, the vocabulary test (Immediate and Delayed) raw scores were also analyzed to determine if the nine intervention participants grew in their understanding of vocabulary and application of their new word meanings. The results of these analyses are presented as descriptive statistics (e.g., means were calculated for each vocabulary learning strategy) in Chapter 4.

With reference to Figure 10 (Creswell, 2009, 2013), qualitative data analysis began with transcribing the participants' interviews and their discussions during the intervention. The participants' discussions were also translated from their L1 into English. Once the transcripts were validated for accuracy with the participants, the researcher read all of the transcripts thoroughly and made marginal notes. These notes were then coded manually. Coding is "analysis of qualitative data processes through classification of ideas, themes, topics, activities, types of people, and other categories

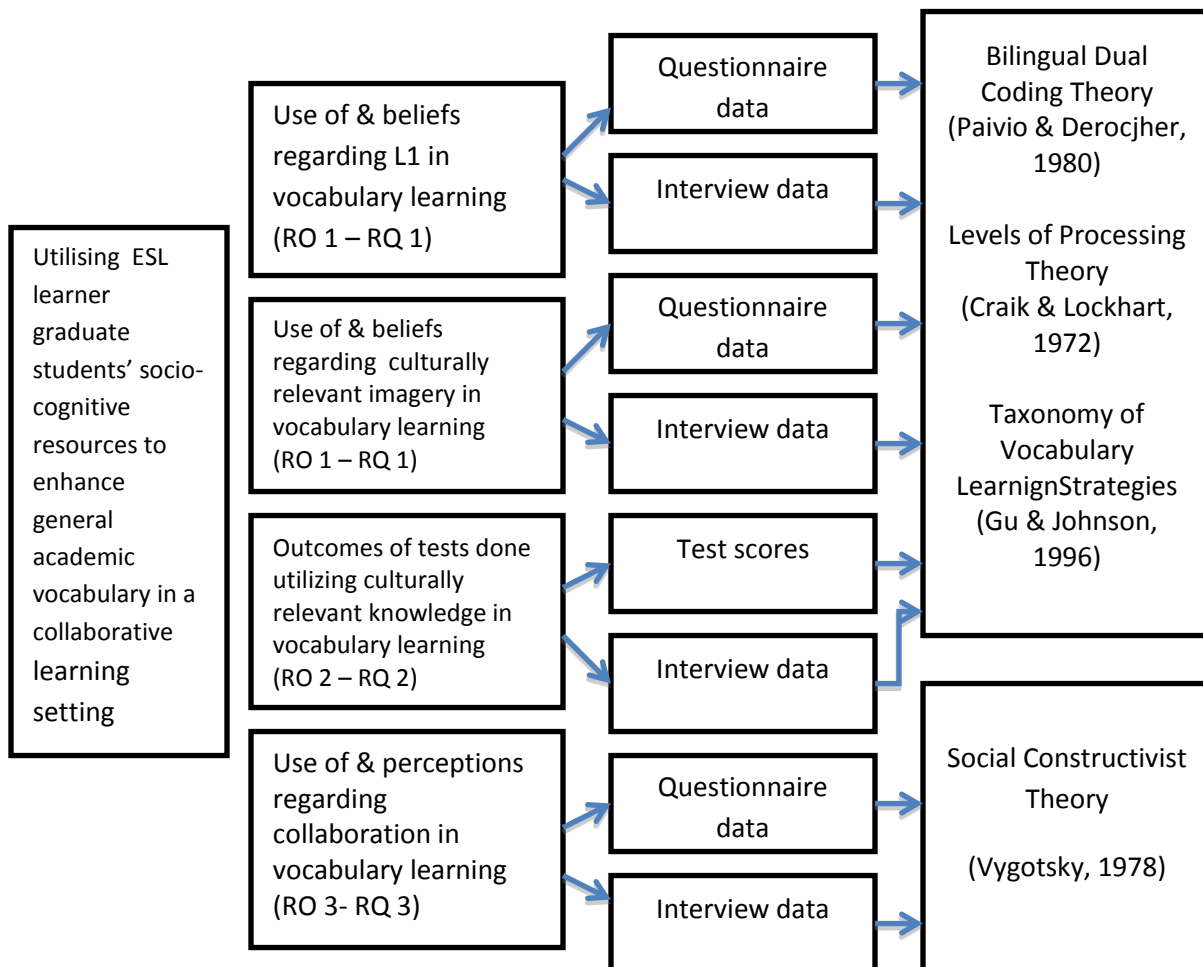


Figure 9. Visual depiction of the data analysis procedure.

relevant to study” (Lapan, Quartaroli, & Riemer 2012, p. 98). In order to employ coding, the researcher adhered to the eight steps process recommended by Tesch (1990).

According to the guidelines proposed by Tesch (1990) for coding, the researcher reviewed all the interview transcriptions in order to obtain a general sense of the type of data gathered. Then, each document was read thoroughly and a list of common topics that emerged across the transcripts was made. The transcripts were read again in order to convert the list of topics into themes that would inform answering the research questions. Finally, data that mapped on to each thematic category were listed separately.

During the data analysis and interpretation, the researcher looked for themes connected to imagery, L1 use, representational, referential and associative connections and collaboration in the interview and intervention transcripts. Themes that describe whether participants were using these strategies and whether they perceived that they were effective in encoding and retrieving new vocabulary items were identified. Using this same analysis procedure, the researcher categorized the notes from the observations under these themes as supplementary data. All themes were interpreted in relation to the conceptual framework of the study and existing literature.

Limitations

Biases occur in qualitative research when the manner in which data are analyzed and collected “is too closely aligned with the personal agenda of the researcher(s)” (Galdas, 2017, p. 1). Galdas (2017) further states that as the researcher is an “integral part” of the entire research process, separation from it is “neither possible nor desirable” (p. 2). In light of this, the researcher’s biases and beliefs are acknowledged as a limitation of the current study.

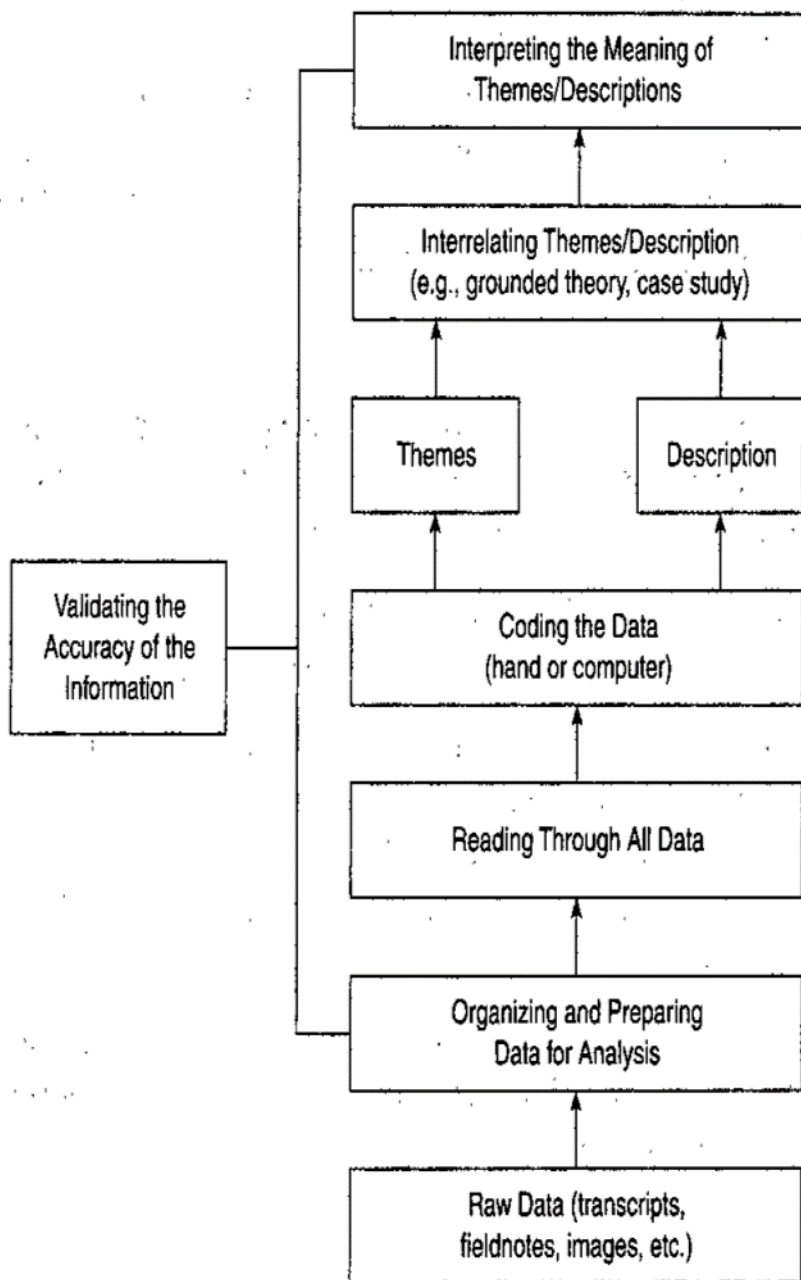


Figure 10. Data analysis procedure in qualitative research (Creswell, 2009, p. 185).

As described in Chapter 1, the researcher is from a bilingual culture and speaks English and Sinhalese, her L1. Thus, in the current study, the researcher's own subjective position, which may have an impact on the way the participants behaved, can be summarized as a South Asian, bilingual, bicultural non-native speaker of English, who is currently pursuing her doctoral studies. Since she is exposed to two cultures, her home culture (i.e., Sri Lankan culture) and the host country's culture (i.e., Canadian culture), she is aware that the images evoked by certain words may be specific to the culture in which they were learned. For example, the word "birdcage" may evoke two different images in two individuals from two different cultures (Jared, Poh, & Paivio, 2013). Additionally, the researcher has extensive background experience teaching post-secondary ESL learners. She believes that strategies can be taught and learned. For these reasons, the researcher has a positive bias toward the efficacy of the VLS and that culturally specific images are better recalled in the culturally congruent language. These biases were managed by the researcher maintaining a role as an observer during the intervention process and allowing the participants to guide their own co-creation of images and use culturally relevant knowledge they share. The researcher deliberately did not impose her beliefs on what the participants were engaged in as she did not want to change the dynamics of their communication and be forced to use a language other than their first language.

With respect to the qualitative portion of the research design, to minimize subjective analysis and interpretation of the data obtained by way of the interview protocol, the participants were provided with an opportunity to elaborate on what they said by the researcher asking clarification questions. Open-ended questions—such as

“What are some of the biggest challenges you have ...?” “Tell me about your experiences ...”—were asked in order to minimize acquiescence bias as this was deemed methodologically important. In order to minimize this bias, closed ended questions were worded in such a way that the participants were provided with options to reflect both ends of an argument. For instance, a close-ended question—such as “Do you consider English vocabulary as a challenge or does it come easily to you?”—provides participants with both options to consider. For all close-ended questions, which may sound as they were being led to affirm the researcher’s biases, the participants were required to provide examples to support their answers.

A limitation of the current study was that in the intervention phase, the participants used their L1 during collaborative group discussions to determine translation equivalents and visual imagery. This made it difficult for the researcher to understand key information relevant to the study while the discussions were taking place. As discouraging L1 is contrary to one of the key foundations in the study, participants were encouraged to use any language that they found comfortable. All the conversations were recorded and then subsequently translated; however, the researcher had to depend on the authenticity and validity of the translation.

Another limitation of the study was the low response rate for the online questionnaire in phase one of the study. Of the international student population at the university where this research took place, only 7% responded to the invitation to complete the online questionnaire. Although there is research showing that response rates to online surveys are relatively much lower than for on-paper surveys (Cook, Heath, &

Thompson, 2000; Nulty, 2008), it may have negatively affected the researcher's ability to generalize the findings.

A related limitation of the study was that the sample was biased given that there was extremely low representation for some languages and high representation for one language. For instance, the institution where the research took place has a 39% international graduate student population. Of this population there is a proportion that is 23% from China (Brock University, 2017a). This statistic could explain the high representation of students from China and very low representation of students from countries like Vietnam. Related to this limitation is the reality that the sample population is from only one institution in Ontario, Canada. Future research might include a stratified sampling procedure in which subpopulations of certain languages within the overall ESL population could be sampled and investigated independently.

Establishing Credibility

Efforts were taken to establish the credibility of this study. First, the research design is based on a Pilot Study that was previously conducted and the researcher made methodological revisions based on the conduct of the Pilot Study. Second, all data collection instruments were validated by four ESL instructors teaching ESL courses. Additionally, triangulation of data and member checks contribute to the credibility of the results of the study.

Ethical Considerations

Prior to commencing the current study, institutional research ethics board clearance was obtained (REB #16-053). The current study followed the Tri-Council Policy Statement conventions for ethical research. The participants were provided with a

letter containing all the relevant details of the study to seek informed consent. As the potential participants were ESL students, all documentation was written in simple, straightforward language. They were informed that their participation was voluntary, and that they had the freedom to withdraw at any time if they wished. For the duration of the study, the tasks they were required to do were explained in detail. For instance, the participants were informed of VLS intervention and given a description of the nature and the benefits of it. Participants were told that if they wish, they would be given details about the outcomes of the study via email. As the researcher was not involved in participants' academic programs in any way, no participant was coerced to take part in the research. The services of three translators was required and verbal agreements with each of them were obtained (for privacy, anonymity and confidentiality) prior to getting the audio recordings of the intervention sessions translated. The participants were ensured of their anonymity and confidentiality, and all necessary steps were taken to protect their privacy. The data collected were treated in a way that protected the privacy of each participant.

Restatement of the Area of Study

The purpose of the current study was to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. Three research questions were used to investigate this issue. The research questions posed queries regarding the general use of VLS among the participants, how receptive they are towards the use of L1 and CRI as VLS, and how effective they are in aiding the retrieval of vocabulary. These

questions were investigated using a mixed methods research design; the study took a case study approach. Thus, both quantitative and qualitative methods were used to collect data pertaining to the VLS use among the participants.

CHAPTER FOUR: FINDINGS—PHASE 1

The purpose of this study was to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. The study investigated participants' views on the efficacy of a VLS that based itself upon their L1s and Culturally Relevant Imagery (CRI) in general academic vocabulary acquisition. It also looked at how such a VLS would impact their general academic vocabulary acquisition.

The following research questions guided this study: 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students?; 1(b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilize their culturally relevant knowledge; (2) To what extent does culturally relevant knowledge facilitate deep processing and productive retrieval of new vocabulary words in ESL learner graduate students?; and (3) What are the experiences of ESL learner graduate students in using culturally relevant knowledge as a vocabulary learning strategy in a collaborative learning setting?

The study, adopting a case study approach, used a sequential explanatory mixed methods strategy to collect data in two phases. Chapter 4 will present the findings from Phase 1 and Chapter 5 will present the findings from Phase 2. Phase 1 was intended to be broad and generally descriptive of the responses of a large sample of ESL learner graduate students, whereas Phase 2 is specific and in-depth with respect to documenting the ESL learner graduate students' intervention experiences. The findings from Phase 1 are derived from a questionnaire that investigated ESL learner graduate students' beliefs

regarding vocabulary acquisition and current VLS use. 41 ESL learner graduate students responded to the questionnaire survey. Out of these 41 respondents, nine took part in the second phase of the study. The second phase comprised of intervention sessions followed by immediate and delayed vocabulary recall tests and a semi-structured interview of the nine intervention participants (this is described in Chapter 5).

The main focus of Chapter 4 is on the quantitative findings, which were gathered by way of the VLSQ during phase one of the study. This focus addresses Research Questions 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students? and 1(b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilize their culturally relevant knowledge? Chapter 4 presents the findings in two sections: Section 1 answers Research Question 1(a) and outlines VLSQ findings on perceptions on learning academic vocabulary, beliefs regarding vocabulary learning approaches and preferences in VLSs among the participants; Section 2 answers Research Question 1(b) and presents the findings from the VLSQ on how often the participants show a preference to use VLSs that utilize their culturally relevant knowledge. A complete list of tabulated VLSQ findings is found in Appendix E.

Findings on Learning Academic Vocabulary, Vocabulary Learning Approaches, and Vocabulary Strategy Preferences

Question items on the VLSQ garnered the participants' perceptions on vocabulary usage to express complex thoughts in both written and verbal formats. Specifically, questions on the VLSQ aimed to explore how ESL learner graduate students perceive the task of learning academic vocabulary, their beliefs about vocabulary learning approaches,

preferences for vocabulary strategies and collaboration in vocabulary learning.

Collectively, the findings below answer Research Question 1(a).

Perceptions on Learning Academic Vocabulary

Overall, the VLSQ was administered to document the perceptions of ESL learner graduate students regarding vocabulary learning. There were general, introductory questions on the VLSQ that gathered information on the participants' views on vocabulary in academic writing, whether they find vocabulary learning interesting or not, and their desire to pursue vocabulary learning. The majority of the ESL learner graduate students, 93% of them, evaluated their proficiency in English vocabulary for academic writing as either "good" or "fair." Yet, in terms of their perceptions on mastering the vocabulary needed for academic writing, 90% of them found it to be either "difficult" or "of medium difficulty" to master. These perceptions seem contradictory.

Responses indicated that 54% of the participants found vocabulary learning interesting. In congruence with this view, 66% of the respondents had the motivation to continue with the vocabulary learning process even when they feel bored or frustrated. Interestingly, despite the fact that approximately 40% found the task boring, 71% of participants indicated the volition to learn more words than what they typically encounter in their academic work. Also, 66% were motivated to enhance their vocabularies, as it is crucial for passing tests. The majority of the questionnaire respondents consider vocabulary learning as fundamental to their academic activities.

Beliefs Regarding Vocabulary Learning Approaches

The VLSQ included questions that investigated 18 beliefs regarding vocabulary learning approaches. This section of the VLSQ specifically asked the ESL learner

graduate students who speak English as a Second Language to express their beliefs about how they approach the task of vocabulary acquisition.

According to the questionnaire findings, 83% of the respondents believed repetition is one of the best ways to learn new words (see Table 3 in Appendix E). Although a significant number of respondents thought repetition is effective, only 54% thought memorizing lots of individual words will help them acquire a large vocabulary (see to Table 4 in Appendix E). These two findings highlight the participants' beliefs about surface-level vocabulary learning strategies such as repetition and memorization.

Interestingly, 90% of the respondents were of the view that it is easier to learn new words when they are presented in context (see Table 5 in Appendix E). In congruence with this, 54% of the respondents thought a foreign language vocabulary can be easily acquired through reading (see Table 6 in Appendix E) while 80% believed guessing the meaning of words in context is one of the best ways to learn vocabulary (see Table 7 in Appendix E). Further, 80% of the respondents were of the view that when new words appear several times in different contexts, one is eventually able to figure out what they means (see Table 8 in Appendix E). These latter four descriptive findings suggest that the respondents placed significance on context in vocabulary acquisition.

The next set of findings suggests that the ESL learner graduate students were somewhat knowledgeable about how to approach vocabulary learning. For instance, 95% of the respondents believed that learning words includes learning phrases as well (see Table 9 in Appendix E). Also, 90% of the ESL learner graduate students had an awareness that vocabulary learning entailed learning its form, meaning and use (see Table 10 in Appendix E).

In sum, the respondents believed memorization and repetitious exposure to words in context are learning approaches to expand vocabulary. They also believed that vocabulary acquisition entails learning word meanings as well as their forms, and uses.

Vocabulary Strategy Preferences

The VLSQ administered to the participants also included questions that explored their current VLS usage. The 44 strategies listed in the questionnaire are divided into nine categories or types: rehearsals, encoding, dictionary, note taking, guessing, activation, using technology, affective, and social. These nine strategy categories are divided again into 16 subcategories (refer to Table 3 below).

Tables 21-81 in Appendix E present the percentage of respondents who either “often” or “always” used a particular VLS. Table 3 summarizes the popularity of each category of strategies for all of the participants in the sample. As shown in Table 3, it is evident that among the respondents, “technology-based” strategies are the most popular method of VLS followed by “dictionary use” and “oral repetition”; “guessing strategies” and “contextual encoding” also seem to be popular among them. The least popular strategy class was the “social strategies: communication and cooperation.” This subcategory includes collaboration and will be further described in the next section and explored in Chapter 5 as a function of the intervention and case study.

Collaboration in Vocabulary Learning

VLSQ findings revealed that only 8.3% of the respondents were in favour of “social strategies: communication and cooperation” (refer to Table 3). For instance, only 2% stated that they would obtain teachers’ assistance when new words are encountered (see Table 78 in Appendix E).

A very low percentage (10%) stated that they would cooperate with their peers in word learning (see Table 79 in Appendix E) while a similarly low percentage (14%) claimed that they share their vocabulary learning experiences with others (see Table 80 in Appendix E). It was apparent that collaboration and cooperation were seldom associated with vocabulary acquisition among the ESL learner graduate student population. This finding was used as the impetus for the design of the intervention and Phase 2 of this study that explored the utilization of culturally relevant knowledge in vocabulary acquisition in a group learning setting.

Finally, the data from the VLSQ were also statistically analyzed to determine whether there was a tendency among participants to use more L1 based and imagery-based strategies. These analyses employed the Chi-square Test of Independence and Spearman's Rank-Order Correlation. These analyses aimed to find out whether the participants who believe in the efficacy of L1 and imagery, actually favoured strategies based on them, and whether there was a correlation between their beliefs and strategy use. Statistical significance was set at $p > 0.05$ and no significant relationships were found.

Learners' Use of Culturally Relevant Knowledge in Vocabulary Learning Strategies

Research Question 1(b) focused on the participants' beliefs on the use of culturally relevant knowledge in vocabulary learning. There were specific questions on the VLSQ which aimed to explore whether ESL learner graduate students favour VLS that utilise their culturally relevant knowledge and draw from their L1 and CRI.

Table 3

Summary of Participants' VLS Preferences from the VLSQ Sub-Categories

Summary – All strategies	Percentage of participants using the strategy
1. Rehearsal: Using word lists (4 strategies)	21.3%
2. Rehearsal: Oral repetition (2 strategies)	51.2%
3. Rehearsals: Written repetition (2 strategies)	34.2%
4. Encoding: Associations (5 strategies)	31.6%
5. Encoding: Imagery (3 strategies)	20.3%
6. Encoding: Visual encoding (2 strategies)	45.1%
7. Encoding: Semantic encoding (2 strategies)	24.4%
8. Encoding: Contextual encoding (3 strategies)	41.6%
9. Encoding: Word Structure (2 strategies)	25.0%
10. Dictionary strategies (4 strategies)	53.7%
11. Note Taking Strategies (2 strategies)	41.4%
12. Guessing strategies (2 strategies)	46.3%
13. Activation strategies (2 strategies)	35.3%
14. Using technology to study vocabulary (4 strategies)	60.0%
15. Affective strategies (2 strategies)	40.0%
16. Social strategies: Communication and cooperation (3 strategies)	8.3%

Perceptions on the Use of L1

Question items explored the respondents' beliefs on whether they perceive they should always connect a new word with its L1 meaning. The findings in this regard revealed that 34% of the respondents believed that they should make connections to their L1 when learning a new word while another 34% were not sure whether or not they should. The remaining 32% did not believe that there was a need to connect a new L2 word with their L1. Interestingly, the respondents were almost equally divided in thirds for each of these answers (see Table 11 in Appendix E). Contrary to this, 50% of the ESL learner graduate students believed that their first language is an important resource in developing their English vocabulary (see Table 20 in Appendix E).

In terms of VLS use, there were seven strategies which could utilize a learner's L1. The following are the six VLS categories where L1 could be accessed as a support: rehearsals, encoding, using technology, dictionary, affective, and social. There were significant variations in the popularity of L1 based strategies. For instance, the findings indicated that the ESL learner graduate students' L1 based rehearsal strategies (see Table 30 in Appendix E) and social strategies (see Table 79 in Appendix E) were the least popular among the respondents. Specifically, only 27% repeatedly write word lists with L1 equivalents to remember them (i.e., rehearsal strategy) while only 10% review new words with a colleague where one says the English word, and the other translates it into their L1 (i.e., social strategy). On the contrary, employing L1 was quite popular in encoding strategies such as linking a new word to its L1 equivalent (61%) and technology-based strategies such as looking up L1 equivalents in online dictionaries (54%) (see Tables 34 and 71 respectively in Appendix E). Affective strategies that utilize

L1 were also of substantial popularity as there was 42% claiming that they use their mother tongue in word learning (see Table 75 in Appendix E).

Another series of questions in the VLSQ sought to find out the use of L1 as a strategy in vocabulary acquisition by investigating the type of dictionaries the respondents use. The findings revealed that 39% use bilingual dictionaries while 34% use monolingual dictionaries (see Tables 57 and 56 in Appendix E respectively). As for online dictionaries, as stated above, 54% the respondents stated that they look up L1 equivalents for unfamiliar English vocabulary.

In conclusion, the majority of the respondents held the belief that their L1 is an important resource in L2 vocabulary learning. In congruence with this, the respondents demonstrated a preference to use certain L1 based VLSs such as encoding strategies, affective strategies and technology-based strategies but they did not favour rehearsal and social strategies.

Perceptions on the Use of Imagery

The VLSQ queried the respondents' beliefs regarding imagery use in vocabulary learning. Approximately 60% demonstrated a positive disposition towards using imagery in word learning (see Table 12 in Appendix E). When asked about their familiarity with the images used to teach vocabulary in textbooks, 49% indicated that they have very little/no awareness of the application of images to learn words (see Table 18 in Appendix E).

Another series of questions in the VLSQ included question about three VLSs that involved encoding imagery: acting out words, creating mental imagery, and associating one or more letters in a word with the word meaning. The questionnaire findings indicate

that overall, using imagery did not seem like a strategy that was popular among the participants as only 20% indicated that they adopted it in vocabulary learning (see Table 42 in Appendix E). Each of the strategies mentioned above were utilized by a very low percentage of the respondents—39% acting out words; 19% creating mental imagery; 22% associating one or more letters in a word with the word meaning to help remember it (see Tables 39, 40, 41 in Appendix E).

Perceptions on the Use of CRI

There were questions on the VLSQ aimed at finding out the respondents' perceptions and use of CRI in vocabulary learning. The findings from these questions are noteworthy as CRI is a consideration in the participants' use of their culturally relevant knowledge to enhance vocabulary learning. Although most respondents were not aware of the type of images used in ESL resource books, 59% of them believed that finding associations between new words and imagery from their experience in their country and culture would make it easier to remember meanings of new words. Only 12% disagreed with this statement (see Table 19 in Appendix E).

Summary of Findings

Chapter 4 has described the findings from Phase 1 of this research which is a broad and generally descriptive depiction of the responses of a large sample of ESL learner graduate students. Findings for Research Question 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students? indicate that the majority believe that they have proficiency in English vocabulary for academic writing but find it difficult to master this skill. More than two-thirds of the ESL learner graduate students are motivated to enhance their vocabularies. The respondents tend to

believe that strategies such as repetition and memorization are effective in vocabulary learning. They also placed significance on context in vocabulary acquisition, word forms, meaning, and use.

Most of the ESL learner graduate students use “technology-based” and “dictionary-based” strategies, followed by “oral repetition,” “guessing,” and “contextual encoding” strategies to learn new words. The least popular strategy class was the one that entails “social strategies” including collaborative approaches. Findings of Research Question 1(b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilize their culturally relevant knowledge? do not indicate a strong preference among the respondents to use their L1 as a VLS, yet they believed it to be an important resource in developing their English vocabulary. There is a lack of awareness among ESL learner graduate students that imagery can be used as a VLS and that CRI are instrumental components in their culturally relevant knowledge.

In the next chapter, Chapter 5, the findings from all three research questions as they relate to the Phase 2 of the study are presented. Phase 2 is specific and in-depth with respect to documenting the nine ESL learner graduate students’ intervention experiences.

CHAPTER FIVE: FINDINGS—PHASE 2

As stated in Chapter 4, the purpose of this study was to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. The study examined the participants' perceptions on the usefulness of culturally relevant knowledge (i.e. a combination of L1 and culturally relevant imagery), as a potential vocabulary learning strategy (VLS) to acquire general academic vocabulary words.

The following research questions guided this study: 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students? 1(b) How often do ESL learner graduate students show a preference to use vocabulary strategies that utilize their culturally relevant knowledge? (2) To what extent does culturally relevant knowledge facilitate deep processing and productive retrieval of new vocabulary words in ESL learner graduate students? (3) What are the experiences of ESL learner graduate students in using culturally relevant knowledge as a vocabulary learning strategy in a collaborative learning setting?

This chapter focuses exclusively on the findings as they relate to the experiences of the nine participants who participated in the intervention. Thus, the findings presented in Chapter 5 have a qualitative orientation along with some quantitative findings that describe participants' test scores as a function of the intervention. The qualitative data are derived from observations during the intervention and post-intervention interviews. It is important to note that there are four sections in Chapter 5 that each answer one of the research questions. The data excerpts from the intervention observations and semi-structured interviews were chosen from among those that best reflect the participants'

experiences and perspectives.

Section 1 of this chapter focuses on the participants' views on the impact that learning academic vocabulary makes on their writing and their perceptions on learning academic vocabulary. This first section also includes the nine participants' beliefs on vocabulary learning approaches and the previous and current VLS they employ to enhance their academic vocabularies. As such, for the nine intervention participants, the first section of Chapter 5 responds to Research Question 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students?

Section 2 responds to Research Question 1(b) through a description of the nine intervention participants' use of their culturally relevant knowledge in vocabulary learning strategies. Culturally relevant knowledge has been operationally defined as the use of their L1 and culturally relevant imagery.

To answer Research Question 2, Section 3 of this chapter summarizes the outcomes of Immediate and Delayed Recall Tests, and the findings from the interview questions on the perceptions of the participants regarding the efficacy of culturally relevant knowledge in facilitating deep processing and productive retrieval of new vocabulary words.

Finally, Section 4 of this chapter answers Research Question 3 by presenting findings from the intervention sessions and interviews where the participants comment on the efficacy of collaboration in vocabulary learning.

Section 1: ESL Learner Graduate Students' Vocabulary Learning Strategies

Section 1 of this chapter has four sub-sections: (a) Perceptions on Academic Vocabulary's Impact on Writing; (b) Perceptions on Learning Academic Vocabulary; (c) Beliefs Regarding Vocabulary Learning Approaches; and (d) Vocabulary Strategy

Preferences. Section 1 will present findings that address Research Question 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students?

Perceptions on Academic Vocabulary's Impact on Writing

During their interviews, all participants except one expressed that academic writing was one of the most challenging of all academic activities they are expected to perform within their programs of study. All but one of the participants attributed their academic writing challenges to the use of high frequency general academic vocabulary as opposed to the low frequency domain-specific vocabulary. For instance, Ahmed verbalized the challenges he encounters when writing based on his command of vocabulary:

I think one of the most important problems I face when I write, [is] the lack of capacity [to put] for [sic] your thoughts into language. So you have big ideas but you cannot express [them] and [sic] with very specific terms because you lack [the words]. You have many concepts in your head but you cannot describe [ideas] the way you want to. (Ahmed, Interview, May 19, 2017)

According to Ahmed, Second Language (L2) writing can pose challenges to the learner due to inadequate vocabulary even if he/she possesses a substantial receptive vocabulary. This is attributable to the fact that a large receptive vocabulary does not equate to an expressive (i.e., speaking and writing) vocabulary of the same magnitude. Both Ahmed and Lina, who speak Arabic as their L1, perceived the English language to be very descriptive with a precise and vast vocabulary, which they believed makes it

extremely difficult to master. Both Lina and Ahmed stated their concerns regarding the precision of vocabulary the following way:

I always believe that the English language is richer and it's completely different when you have to use a variety of precise vocabulary than others [sic]. For me, I feel it's a little bit—yeah [hard]. It's hard to explain it. It's not frustration but it's kind of—I am overwhelmed [by it] to look at it [sic] and yes, I need it, and it's not an easy process for me to learn. It's difficult sometimes, yeah. (Lina, Interview, June 26, 2017)

I found it [has] too many words. It's very descriptive, the English language is very descriptive and [there is] too much vocabulary, so I found it very challenging to learn all of this. (Ahmed, Interview, May 19, 2017)

From Ahmed's perspective, some of the words in the English language are very specific, and one needs to have an in-depth knowledge regarding the contexts in which a particular word can or cannot be used in writing. He illustrated this complexity as follows, "I found [that for] the English language, the vocabulary, it's very specific. You can describe things with, say, everything has a name. In Arabic, a chair is a chair" (Ahmed, Interview, May 19, 2017). He wondered whether someone from a different language background could fully understand the intricacies of English vocabulary and its impact on writing. As stated by Ahmed, written Arabic is pure and does not include any foreign terms:

Arabic doesn't accept foreign terms from different languages and you try to translate it, [For example] a computer, it's called something else, to translate it

[sic]. So, not accepting new vocabulary made the language very [simple] simplistic. (Ahmed, Interview, May 19, 2017)

As a result, the Arabic language remains free of any foreign words and differs widely from the English language that ‘borrows’ from other languages. Consequently, as stated by Ahmed, Arabic L1 speakers may have problems in other linguistic environments, as they do not share certain common words that occur across cultures. The excerpt below illustrates his perspective in his own words:

They don’t translate it. They don’t use the term. Let’s say, a TV—they’re not gonna call it a television. They’ll give it a different name. They’ll make a word in Arabic. My wife is Chinese and she has a lot of vocabulary [from different countries], and with words that come from Japan with food, kinds of food. I don’t know this, because you bring me to Japan and the technology, the food or whatever, they keep the same name. So, if you come here and you [mention] told them tofu or sushi, for example—this is not a good example—they know what it is. Now, if someone goes to an Arab country, they would give it an Arabic name. It doesn’t match. (Ahmed, Interview, May 19, 2017)

For Mei, Xiaoli, and Safiya, low frequency domain-specific vocabulary was not as challenging as high frequency general academic vocabulary. In fact, all participants except Tamryn perceived general academic vocabulary as the challenge that prevents them from becoming better writers. Xiaoli, Safiya, and Lina believed that their writing compositions require constant revision and that their general academic vocabularies tend to be rather simple, broad, or vague. For them, expressing their thoughts in writing using

appropriate vocabulary is hard work. As a result, they perceived that they spend an unnecessary amount of time on writing.

Describing this further, Safiya affirmed that it is challenging to determine the meaning and use of general academic vocabulary and she often wonders when and how a particular vocabulary word is used. As a result of this, she ends up using only the words that she is familiar with in her writing. This prevents her ability to convey her thoughts in writing in more complex, sophisticated language. She verbalized her issue as follows:

To choose the right vocabulary, the right academic one. I'm always make [sic] it easy but, you know, always I am choosing the easy vocabulary that I already understand, but it doesn't work. I [receive] too many comments from my supervisor, "No, Safiya, you have to keep going and looking for academic words. Read. Read a lot from like [sic] articles, academic ones and choose the right one, copy it, see it, but you have to [use] not always the same vocabulary." He said, "You always choose the same vocabulary." (Safiya, Interview, June 26, 2017)

In her opinion, knowing the meaning of a word does not guarantee that one is able to apply it in all language contexts.

Nadia and Mei also shared similar sentiments in that they too often find themselves in situations where their inadequate vocabularies prevent precision and sophistication of written expression:

The problem sometimes [is] or the vocabulary [sic]. Sometimes I have problem [finding] for [sic] good vocabulary. I can't use it for the assignment. For me, it's just vocabulary. Sometimes I choose the vocabulary, but the meaning does not go [sic] for the assignment. (Nadia, Interview, August 13, 2017)

Mei and Xiaoli both have challenges with word collocations, words that often go together. Although they understand individual words, word combinations cause them difficulty in terms of determining meanings. Xiaoli stated this issue the following way: “Yesterday we had an assignment. The question’s like, ‘What is strategy implication?’ I understand what is [a] strategy. I understand what is [an] implication. But I don’t know what is [a] strategy implication” (Xiaoli, Interview, May 12, 2017). Mei considers, in addition to general academic vocabulary, that learning other general vocabulary is also needed to engage in her daily activities outside of the classroom, but this poses insurmountable challenges to her.

As a result of being exposed to English over many years, Tamryn does not perceive vocabulary learning to be a challenge anymore. Tamryn does admit that, at the beginning, he found vocabulary learning to be a tedious, monotonous task. Discussing the role of the resources and instruction in his ESL learning, he stated that in Uzbekistan, his native country, the traditional English teachers used teacher-directed pedagogies that lacked dynamism. During this period, there was a shortage of texts, which also contributed to the lackluster programming that he received:

When I started to learn English in middle school- maybe primary school. Maybe [I was] 11, 12 [then], I started learning English, and at that time, it was a challenge for me. It was [during] Soviet times so we didn’t have enough books. And the teachers were, I don’t want to say they were old, but they were very old. I was 11 or 12 years old and they were 50+. So, that was a big challenge for me. (Tamryn, Interview, May 26, 2017)

Tamryn expressed that these were the main factors that contributed to the challenges he encountered as a beginner level ESL student. He said he moved to Russia as a young adult and experienced slightly better conditions in terms of the efficacy of teaching methodology, “After I moved to [Russia]—first I started in Uzbekistan and then I went to Russia where the teachers were a bit younger and a bit different” (Tamryn, interview, May 26, 2017). Curiously, he equates the age of the teachers to their innovation. He further claimed that he experienced advancements in English language teaching as he moved from country to country over a period of time, “So I faced all these changes that happened, technology appeared and electronic dictionaries, so I started with these [paper] dictionaries and then we got the electronic ones and now we have the mobile phone” (Tamryn, Interview, May 26, 2017).

Two of the participants, Ahmed and Ksana, also expressed that L2 vocabulary influences them in ways other than restricting their abilities to express themselves in academic writing. For example, both Ahmed and Ksana stated new words pose significant challenges when they are reading both academic and general texts to support their writing:

This year, when we read from a scientific article—because we don’t read books anymore, right? We read articles. There are sometimes words that are not scientific terms, a noun or a verb, and I don’t know what that means. That happened three times when I was writing my thesis. I went to my dictionary to see what the word was because I don’t think I saw [sic] it before. (Ahmed, Interview, May 19, 2017)

In a similar vein, Ksana feels that certain reading materials can pose a lot of challenges to her due to the advanced vocabulary they contain:

Usually I read the *Forbes* magazines, the words are really English, I would say. They are words you would rarely [encounter] in your daily life even [in] a [sic] field of communication or whatever. It's like, maybe I would say they are too modern. That's what I would say. *Forbes* magazine I would say [contains] really high-level language. I feel challenged sometimes, especially with articles on economics. (Ksana, Interview, June 9, 2017)

She believes that this type of vocabulary compromises her comprehension and hinders her ability to produce well-structured written responses.

There were also instances where perceived inadequacies in vocabulary restricted ESL learner graduate students' abilities to select a course of study given the potential demands on academic writing. For instance, Xia said she deliberately avoided selecting a program of study that entails extensive writing due to her inadequate vocabulary. She stated, "It's lucky for me, because I choose finance and accounting. A lot of numbers, so I won't make mistake about that. That's why I don't [didn't] choose marketing or human resources" (Xia, Interview, May 26, 2017). For her, dealing with numbers is definitely easier than struggling with word meanings and written expression.

Despite finding academic vocabulary a challenge, the participants agreed on the significant impact of vocabulary on academic writing as students in an Anglophone university. For instance, almost all struggled to enhance their academic vocabularies and wished to become better writers despite their different perceptions regarding the process of L2 vocabulary learning in an academic context.

Perceptions on Learning Academic Vocabulary

Similar to the general findings from the large sample on the VLSQ, the nine participants asserted that despite it being challenging, they are motivated to enhance their vocabulary knowledge. The nine participants had mixed attributions about the challenges of learning academic vocabulary. Ahmed finds that learning academic vocabulary is “overwhelming” due to its sheer magnitude. His perception about the vastness of the English language is expressed, “I can guarantee some of these words even a native speaker wouldn’t know” (Ahmed, Interview, May 19, 2017). Due to his preoccupation with the enormity of English vocabulary, he often finds himself in speech situations where he focused on the unfamiliar words of the interlocutor rather than on the message:

Yes, kind of, it’s overwhelming in a way, but sometimes knowing, or not recognizing, or not knowing these terms, because you know about these terms exist sometimes [sic], and sometimes, when you listen to someone who’s talking, you focus on the words you don’t know, and you cannot hear them [the speakers] somehow. (Ahmed, Interview, May 19, 2017)

Most of the participants also found learning academic vocabulary an emotionally laden task. The following are some of the words and phrases they used to describe the process of learning academic vocabulary. Ahmed perceives vocabulary learning to be “hard work,” and that he is a poor vocabulary learner compared to many others from his background. Both Lina and Safia also found learning vocabulary to be “overwhelming” while Safia stated that she “panics” when she encounters unfamiliar vocabulary. Both Ksana and Xiaoli specifically found the English spelling system to be “extremely frustrating.” For Xia, learning vocabulary is “part of anyone’s life,” and thus, it is

“pointless to complain about it.” Tamryn also shares this sentiment, as he too treats vocabulary learning as something “inevitable.” On the contrary, Nadia enjoys learning vocabulary and perceived herself to be a good vocabulary learner.

In sum, it is evident that learning academic vocabulary may evoke some emotions in these ESL learner graduate students. The interview findings suggest that most participants found that learning general academic vocabulary holds a certain degree of challenge, yet they consider this learning as necessary.

Beliefs Regarding Vocabulary Learning Approaches

In Chapter 4, the large sample of respondents that took the VLSQ expressed their beliefs regarding previously used vocabulary learning approaches that include memorization and repetitious exposure to words in context. This large sample also believed that learning words entail learning their forms, meanings, uses and phrases that contain them. The participants that were interviewed described a variety of vocabulary learning approaches from their previous experience.

Lina who was from Libya, said that she always tried to keep her L1 and L2 separate from each other. Although now Lina does use her L1 to remember word meanings, as a beginner level ESL learner in Libya, she was discouraged to use it in the L2 learning process, “At the very beginning, [as a strategy] I used to do [sic] to learn vocabulary, I used to write [a word] its meaning in my own language and then we were encouraged to refrain from doing that, so from then, I thought I shouldn’t do that.” (Lina, Interview, June 26, 2017)

Mei reminisced about her vocabulary learning experience based on the language learning approaches in China in the following way:

Mei: At first, I don't [didn't] know how to pronounce them, so I just listen to the tape and the video and write the Chinese [translation] to help me pronounce it and then I had to remember how to spell it, so in this case, especially my mom, especially because she only knows the 26 [letters in the] alphabet and then after I remember it, she will ask me how to spell it and what's the meaning of this. This is the most popular way in China to learn English.

Interviewer: So, you learn the English word and the Chinese meaning of it?

Mei: Yes, and also, after that, when I grow up a little bit, I try to learn the words from a small story. And it is easier for me to remember it because before that I just read a word and then write them and remember them but when I read the [sic] stories or listen to the [sic] songs, I can really understand it and don't need to spend much time on it and I can remember. (Mei, Interview, May 5, 2017)

Mei also said she always tried to analyze the context as it provides vital clues to infer meanings of unknown words.

Tamryn shared his experience with rote methods to vocabulary learning. He described his reliance on word lists as a beginner in the following way:

When I was in primary school, we were taught to—what we have in our class, we have this book and these units in this text and we would read this text and translate this text and, down below, there were some words, there was translations, so teacher just asked us to learn [sic]. She was saying, “Learn these words by heart,” and every time at the beginning of the class, she'd ask us one by one these words, so I started learning these words. (Tamryn, Interview, May 26, 2017)

However, Tamryn did not continue to learn vocabulary in this manner, as he felt that he required learning more than the meaning of a word. For Tamryn, learning a word's synonyms, pronunciation, and etymology became more important than merely learning a word's meaning.

The participants featured above have expressed their beliefs about vocabulary learning approaches that they experienced in the past. They recognize that these approaches are not as effective for their current vocabulary learning needs and they have begun to adopt more effective strategies.

Vocabulary Strategy Preferences

The nine participants employed a variety of different VLS to enhance both their general academic and domain-specific vocabularies. The strategies ranged from using dictionaries to employing personal connections to learn new vocabulary items. This is an interesting finding given the fact that some of the respondents revealed that they lacked awareness regarding VLS in their home countries, as there was no explicit teaching of strategies.

Dictionaries. Using translation dictionaries was one of the most discussed strategies employed by the participants. Most participants showed a preference to use bilingual dictionaries when they encounter a new L2 word for the first time. However, there were others who either used monolingual dictionaries or avoided dictionaries at all.

Ahmed said he used a dictionary during his first 2 years in Canada but eventually gave it up. He stated his reasons as follows; "I used a dictionary for the first 2, 3 years [after] coming to Canada. After that, for a certain reason I discover[ed] I learned very many vocabularies and how to use them without looking at dictionaries" (Ahmed,

Interview, May 19, 2017). He infrequently relies on dictionaries and he believes using monolingual dictionaries makes no sense for beginner level language learners. “As a beginner [it] is not helpful at all and that [it] is a joke. When my teacher introduced it to me I said, ‘Are you kidding me? How do I know what that is?’” (Ahmed, Interview, May 19, 2017).

In Libya, Lina received strict instructions and refrained from using bilingual dictionaries even in the early stages of her language learning process. The current VLS that she uses is highlighting words and then referencing them in monolingual dictionaries. Nadia, the third participant from Libya, also relies only on dictionaries for vocabulary enhancement. However, unlike Lina, she uses a bilingual dictionary as she finds it more beneficial.

Unlike most of the participants, Mei prefers to use monolingual dictionaries if she is unable to use contextual clues to guess the meaning of a new word.

But I think maybe English-English [is] more efficient because I realize now when I look [up] new words in English to Chinese and I found maybe after several minutes, I forgot it and look up for many times and still can't remember it, but once I look it up in the English to English, it is easier to remember. (Mei,

Interview, May 5, 2017)

However, most of the time, she tries to avoid dictionaries as she finds it troublesome and, instead uses contextual clues. Although she feels her guesses are accurate most of the time, she was aware that that this practice only contributes to the growth of her receptive vocabulary.

On the contrary, Xia uses a bilingual dictionary for several reasons. In her view, she needs a bilingual dictionary to have a clearer understanding of unfamiliar, abstract vocabulary. Her other reason for using a bilingual dictionary is as follows:

I try to use the English version but I found it cost a lot of time. Especially to explain the [sic] abstract concepts, I have to use my mother language. For example, I studied finance. We have to use a lot of statistic[s], so there [are] a lot of term [sic] I haven't seen before. I have to link them to my mother language, so that's why I can learn easy. (Xia, Interview, May 26, 2017)

Xiaoli also relies on her L1 and she explained her reasons for using a bilingual dictionary the following way, "I understand the word in Chinese. So, it's difficult for me to, for it to explain it [sic] in a language I'm not fully familiar with" (Xiaoli, Interview, May 12, 2017). However, when there are instances where she cannot find L1 equivalents, she tries to guess the meaning by using contextual clues or opts for a monolingual dictionary. Although she uses a bilingual dictionary, she does it instinctively without knowing whether it plays a facilitative role in her L2 acquisition or not.

Both Ksana and Tamryn also use online bilingual dictionaries although Ksana finds it a challenge to determine the correct L1 equivalent given the vastness of the Russian language.

Safiya believes that using her L1, Arabic, enhances her understanding and, hence she uses a bilingual dictionary. For her, it is imperative that she understands what a word means before attempting to remember it. If she feels the Arabic definitions do not make sense, she switches to a monolingual dictionary.

Yes, I use the bilingual one, the Arabic. If the meaning doesn't make any sense to me, I use the English-English one. Yeah. I'm not the [sic] person to remember everything, so that's why it makes sense to use the general words. Always I need to understand it to have the Arabic definition or anything to help me to understand the word before I will remember it. (Safiya, Interview, June 26, 2017)

Nadia also echoed similar sentiments, as she too uses a monolingual dictionary to look up technical words and a bilingual dictionary for all other words.

The findings point out that in terms of dictionary use, that the majority prefer bilingual dictionaries while others rely more on monolingual ones. At the same time, there are ones who try to avoid using dictionaries as they use contextual clues to guess meanings of words.

Other vocabulary learning strategies. When asked to describe any of the vocabulary learning strategies that they have learned or are currently using, the participants offered a variety of ill-defined strategies. Ahmed elaborated on his language learning experience with respect to vocabulary strategies in the Libyan ESL classroom the following way:

When I was taught English as a second language, I wasn't taught certain learning strategies. Learning English, it was a very traditional class where we were learning vocabulary. I don't think the teacher showed us like a strategy or what strategy will fit you because it was the same strategy for everybody, right? That's why everyone was on the same line and you start and continue starting. I think the way you've done it, yeah, could be good for some, but no good for others. You know what I'm saying. And I'll tell you why it's wrong. I think learning the

classical, traditional way isn't right for everybody. Everybody has to have their own strategy that fits their needs and how they are able to learn. (Ahmed, Interview, May 19, 2017)

Lina, who is also from Libya, confirmed the lack of awareness among Libyan students regarding VLS. Safiya claimed that even in Canada, they were not taught VLS in the university ESL classroom.

Unlike most of the other participants, both Ksana and Safiya employed a combination of vocabulary learning strategies to improve their vocabularies. Ksana first described repetition and then her use of metacognition:

There is one psychological theory. If you see a word up to seven times that you remember that. That's what I was doing. I was going on the subway on [the] bus with my notes, checking some words, going on again, [and] checking words. That's how I learned. (Ksana, Interview, June 9, 2017).

Then Ksana recounted a personal experience where she used some metacognitive approaches along with this strategy:

Even though I didn't use it [a word] sometimes, I'm thinking, "Oh goodness, I've never, for instance, used the word, *reminiscence*," but then I was just thinking, because I took IELTS and I was thinking, "How did I learn this word before? How do I remember it now?" And then just I remembered that word and I remembered how it's spelled because I saw it continuously. (Ksana, Interview, June 9, 2017)

Ksana reflected on her learning and attributed her vocabulary learning success to seeing a word in context multiple times.

Safiya stated that she was taught a strategy in Libya where she was asked to use the new words she learned in dialogue. For Safiya, this has proven to be an effective strategy:

Yes, I have a very good strategy, which is, like, let's say we have [learn] 10 new vocabulary [words] every day in class. So, my teacher told us, or teaches us, teach us, you have to use it every day, even if you don't have anyone speak [speaking] English in your family, when you come here to class, you guys, connect [it] to a conversation, to you and to another student. Just put this vocabulary in this dialogue to remember and yes, I found it to benefit [sic], a beneficial one. (Safiya, Interview, June 26, 2017)

Both Xia and Xiaoli have no specific, formal VLS, but both of them believe that immersion in English through reading or listening is important. Xia reads to develop her vocabulary, as she thinks it is the only opportunity she has to improve her vocabulary.

I like to read. That's why I know so many words. In my university, college, [after my] bachelor degree, I worked [for] 4 years. I don't [didn't] have any chance to use English, only Chinese, but I like to read English fan fictions and that's my only opportunity to learn English, so that's why I love reading, yes, yes, yes.

That's the strongest part. (Xia, Interview, May 26, 2017)

Similarly, Xiaoli tries to improve her vocabulary by listening to English as often as she can:

I'm a good listener. Yeah. [when] I heard [sic] some new word and I can remember the sound, like how people pronounce it. Then I try to spell it. That is wrong. So I can speak [pronounce] it but I can't spell it. (Xiaoli, Interview, May

12, 2017)

According to her, by paying close attention to the speaker, she tries to pick up new vocabulary words, how they are used, pronounced and then spelled.

These findings suggest that most participants had little awareness regarding the different types of VLSs available to them, and hence, mostly relied on either monolingual or bilingual dictionaries, repetition, or word lists. Although some stated that they attempt to enhance their vocabulary by either reading or listening, it is not clear to what extent they are able to subsequently use words that are acquired in such informal ways.

This first section of Chapter 5 has responded to Research Question 1(a) What are the vocabulary learning strategies currently popular among ESL learner graduate students? The participants acknowledged the challenges that they have with high frequency general academic vocabulary that impacts their writing. For these nine ESL learner graduate students learning academic vocabulary was at times stressful, despite the fact that they viewed it as integral. These participants described vocabulary learning approaches from their previous experiences. None of these methods involved the effective use of L1 as a VLS. Generally, the nine ESL learner graduate students lacked awareness regarding VLS as they had not been explicitly taught such strategies. They tended to adopt strategies ranging from using dictionaries to creating dialogues embedding new vocabulary words.

Section 2: Learners' Use of Culturally Relevant Knowledge in Vocabulary Learning Strategies

In this second section of Chapter 5, Research Question 1(b) will be answered with respect to how often ESL learner graduate students show a preference to use vocabulary strategies that utilize their culturally relevant prior knowledge. In order to

answer this research question, data were analyzed from both the participants' interactions during the intervention and from their interviews. The findings on their use of culturally relevant knowledge in vocabulary learning strategies are presented in three sub-sections: (a) Learners' Use of L1; (b) Learners' Use of Imagery; and (c) Learners' Use of CRI.

Learners' Use of L1

There was ample evidence indicating the use of L1, as it was the primary vehicle of communication during the intervention sessions. Given that the participants worked with their same L1 peers, they switched to English only when they needed to communicate with the researcher. During the intervention sessions, the L1 served different purposes.

Firstly, the use of L1 provided the participants with a stress-free mode of communication. In fact, all the participants switched to their L1 at the onset of the intervention sessions. In his interview, Tamryn stated that if L1 were not used during the intervention sessions, their entire behaviour would have changed.

Secondly, there was an instrumental reason to use L1: L1 was used to establish both referential connections between verbal system 1, verbal system 2, and the image system (refer to Figure 2). Making referential connections between the two verbal systems enabled the participants to learn the L1 equivalent of the target word, which in turn, helped them establish a connection between the verbal systems and the image system (refer to Figure 5)

Thirdly, in addition to referential connections among the three systems, associative connections were made in verbal system 1. For instance, all participants searched for a variety of L1 synonyms to a single target word in order to find the best

alternative. From the associative connections they made, they decided on the best L1 equivalent for the target words. The following are excerpts from notes made by the researcher on the observation checklists for two participant dyads. First, illustrated below are the associative connections Ksana and Tamryn made while looking for a Russian equivalent for the L2 target word “aggregate”:

Tamryn: A multitude, accumulation, plenty, multiple. ... Like gathering, a lot of soldiers, or a crowd of people, a cluster. ...A cluster, crowd. A crowd of people.

Ksana: As you wish, a crowd.

Second, is an example of the associative connections Safiya and Ahmed made while looking for the best Arabic equivalent for the same L2 target word “aggregate”:

Ahmed: Aggregate

Safiya: I don't know. What does it mean?

Ahmed: It's a very specific word for collection or assemblage

During the intervention sessions, the findings indicate that the participants' L1 served at least three purposes. As a means to facilitate the strategies used in the intervention, making referential connections between verbal systems 1 and 2 was one of the primary aims of the research study. An interesting finding was that associative connections emerged as a by-product of the intervention tasks using L1.

Based on these observations that the researcher made during the intervention, the nine participants were queried during their interviews regarding their use of L1 in vocabulary learning. Some were in favour of using their L1 while others tried to resist using their L1. Ahmed, who is Libyan, has been in Canada for a relatively longer period

than most of the others, preferred minimal use of L1 in vocabulary learning. He stated his views as follows:

I prefer now to use English-English because I want to know in a sentence how they use it. I prefer to know what [sic] similar terms in English, something like that. I'm not interested to know what exactly it means. (Ahmed, Interview, May 19, 2017)

Ahmed also showed a preference to use monolingual dictionaries to bilingual ones.

Lina, who is also Libyan, adopted a similar practice to Ahmed by minimally using her L1 but she describes a different reason for doing so:

I was encouraged not to [translate it], to keep it pure English, not to [translate it], you know, use either the meaning or think about it that way. So I was kinda trying to train my brain not to have that process of seeing English or seeing the translation or visualizing it in my language. (Lina, Interview, June 26, 2017)

Lina also explained that she deliberately kept her two languages separate from each other, and she said she uses her L1 to communicate with her spouse and L2 for her academic activities. It is questionable how Lina maintained her two languages as separate given the fact that code switching, code mixing, and code meshing are inherent aspects of multilingual's verbal behaviour. This separation of her two languages might be Lina's perception. Interestingly, Lina elaborated that as a result of the current intervention study, she learned that her L1 could be used as a resource in L2 learning.

Although these two participants (both from Libya) strive to keep their L1 and L2 separate from each other, other participants perceived L1 to be an indispensable resource

in the L2 learning process. Tamryn, discussing the use of L1 as the language of communication during the intervention, stated his perceptions the following way:

Tamryn: Yes. If we discuss in our own language, but if we discuss it in English, it would be totally different.

Researcher: So, you mean, if you discuss in your first language, it would be easier.

Tamryn: Yes, there is not so much pressure and it would be open, but in English maybe it would feel a bit like shy maybe, nervous, especially if a teacher or somebody is next to you but maybe if we are on our own, our first language is better.

Researcher: Now, I was present in all your meetings, but when you were together, you were speaking in your own language, in Russian. So, you didn't feel any of those inhibitions.

Tamryn: Because you don't understand [Russian]. I hope you don't understand.

(Tamryn, Interview, May 26, 2017)

When asked about her use of L1 in vocabulary learning, Xia wondered why L1 is banned in most L2 classrooms, as she perceives it to be a very useful strategy when learning a subsequent language:

Can I ask a question? Why I read a lot of things, when you're learning a foreign language, you have to use it as much as you can and you can't use your mother language? But I find that it helps, using the mother language helps. Why, why a lot of like studies [sic], they don't prefer this way? (Xia, interview, May 26, 2017)

She further stated that although she finds it easier to understand simple sentences without the aid of her L1, in the face of more complicated and abstract concepts, she needs to rely on her L1 to a great extent.

I find it's interesting that when you listen to a simple sentence or a simple concept, my brain can say, "Ok." But when it's a difficult concept or terminology, I translate it in my brain. I don't know. (Xia, Interview, May 26, 2017)

Xia perceives that using her L1 is a tool that she can always fall back on.

Mei, who was also from China, verbalized the influence of her L1 on her L2 communication as follows:

Sometimes I want to express myself, but I can think sometimes of the Chinese in my mind but not of the English. Sometimes also just like the Chinglish [a substandard variety of English used by Chinese L1 speakers] and then others can't understand. (Mei, Interview, May 5, 2017)

She also believed that for her, it was time effective to use her L1 as a scaffold specifically in the construction of complex L2 sentences. From Mei's perspective, it is easier to write an idea out first in her L1, then sometimes translate it to English.

Mei: Because we are more familiar with Chinese, maybe it is easier for us to use Chinese words when we are looking for something.

Also, maybe they [we] do not know how to make a good construction, how to construct them [sentences], so sometimes we write the [sic] [in] Chinese and then it is easier and more fast [sic] for us to...

Researcher: So, you write it in Chinese and translate it into English?

Mei: Or sometimes we don't translate, just because, Chinese is easier for us to

remember. Sometimes if we translate it from English, it takes us a long time to. For me, especially for presentations sometimes, I just write in the Chinese and remember the Chinese and translate. (Mei, interview, May 5, 2017)

Both Tamryn and Ksana, two Russian L1 speakers, believed that banning L1 in the L2 learning process can have detrimental effects. They respectively expressed their opinions as follows:

I think it's very stressful, especially to people who just immigrated to this country. For instance, I speak Ukrainian and Russian, but my husband, he was taught in school only Ukrainian. So, now when I was preparing him for IELTS, I said, "verb" and then the Russian word for "verb" and so he doesn't know. He cannot build a sentence because I'm saying it in Russian. The verb's supposed to follow a noun or whatever and he's like, "What is verb?" because it's different words and he's an adult and he speaks both languages. However, some words which [sic] he doesn't understand because he didn't learn them in his life. And I think for kids it can be very frustrating (Ksana, Interview, June 9, 2017).

I'm thinking in my case, in the beginning, it should be used, especially from people who are coming with the language requirement in their first degree and they're not used to write anything academic. I think in the beginning, they should use [their L1], but I'm not sure. (Tamryn, Interview, May 26, 2017)

Ksana believes that Russian is one of the most complex languages in the world with a comparatively more extensive vocabulary than English. For instance, in Russian, one word could have multiple synonyms, and therefore, when looking for the best L1

equivalent for a L2 word, one has to be extremely careful. He elaborates on this challenge using his L1 to express himself in English.

My first language is Russian and they have much more synonyms and like, as for me, it's one of the most, like the biggest language. In English, you will never find these kinds of words in translation sometimes. That's first. Second, sometimes by multiplying [sic] all the synonyms which I would see in Russian, I could make understanding [understand] what it could mean in English. So, if the word were 'beautiful,' I'm not just going with the first translation. I could see three and then multiply them by understanding [sic], ok, what could it mean? In English, it could be a couple of meanings of the words, and I could check what it means. 'Cause sometimes in English, I see the synonym even for "beautiful–magnificent," let's say. So, they are different words. However, they might seem like synonyms in vocabulary, like translation, which, for a non-native speaker, would feel, oh my God—it's totally different. (Ksana, Interview, June 9, 2017).

Although Tamryn felt that one's L1 should be allowed at the beginner level, in the current study, he believes that the Russian equivalents were of little help in learning words. Safiya, Xiaoli and Nadia also stated that they make use of their L1 in L2 vocabulary learning. Interestingly, all three stated that there are instances where the L1 is of little help with regard to certain words. For instance, Xiaoli claimed that some L2 words have no L1 equivalents.

Xiaoli: Yes. There are some words that don't have it in Mandarin.

Researcher: Can you tell me some words like that if you remember anything?

Xiaoli: I don't remember.

Researcher: But there are words?

Xiaoli: There are words that aren't in the Mandarin system. (Xiaoli, Interview, May 12, 2017)

Both Nadia and Safiya stated that they would look for L2 assistance in situations where L1 is inadequate. Their views are explained with illustrations in the next section on dictionary use.

Learners' Use of Imagery

To garner an understanding of the nine ESL learner graduate students' use (or lack thereof) of imagery in general as a VLS, data were analyzed from observations during the intervention sessions and their interview responses. The objective of the intervention sessions was to have the participants determine L1 equivalents for target words (i.e., to establish referential connections between Verbal system 1 and Verbal system 2) and to create visual cues to recall the target words (i.e., to establish referential connections between Verbal system 1/Verbal system 2 and the Image system). During this process, representational connections are activated, as there are both verbal and non-verbal stimuli. Additionally, associative connections were also made within their Verbal system 1 when looking for the best L1 equivalent for a target word. Associative connections were made mostly in L1 for the target words. These associative connections contribute to a more accurate understanding of the meaning of a target word. In the analyses of observations made during the intervention sessions, there was evidence of connections between the two verbal systems and the image system at representational, referential, and associative levels. The following are excerpts from the intervention data

illustrating how connections are made at representational, referential and associative levels respectively:

Chinese L1 participants making Representational Connections:

Xia: How about we use some sign or symbol to represent government system?

Please think about how to use picture to show it.

Mei: How about the national emblem?

Xia: I can't draw the national emblem, it is too complicated for me to draw.

Xiaoli: How about something like a big ball/circle with some small balls/circles below?

Xia: Oh, no [laughing], that's too abstract to understand [come up with something] I can draw Tian An Men? [Tian An Men is a famous Chinese building representing the government]

Xiaoli: Yes, you could.

Xia: But I forgot how to draw Tian An Men

Mei: We will find a picture [guessing so]

All: Laughing, yes, yes.

Arabic L1 participants making Referential Connections between V1 and V2

Systems:

Ahmed: Concurrent?

Safiya: Does it have to do with current?

Ahmed: Concurrent, it has lots of meanings. Parallel. It's something happening with something else at the same time. Together, simultaneously.

Safiya: Yeah, yeah.

Ahmed: Thinking of somebody attending to two things at the same time, multi-tasking. I am currently doing something and we have more than one government now in Libya.

Russian L1 participant making Associative Connections among V1 system:

Tolkin: I understand the word *couple*. But how about *coupling*? Like *connection*, *union*, *coupling*, *fusion*. ... Like in cosmic *fusion*, or like *association*, *linking*.

[Note: all the words in italics are Russian L1 equivalents of the word “couple”]

Contrary to the findings presented in Chapter 4 for the VLSQ responses, the findings based on the interview responses revealed that the nine intervention participants were aware of the use of imagery-based strategies to learn vocabulary. As part of the introduction to the intervention, these participants were explicitly taught how images could be used as retrieval cues in recalling words. They were then required to apply imagery as a strategy during the intervention when they were learning new words. Thus, their knowledge of imagery-based mnemonics was reinforced during the intervention sessions, as they were required to create images for each new vocabulary item they learned. The findings from the interview data on the utility of imagery-based strategies were twofold: some respondents viewed imagery as an effective strategy, while the others perceived it impractical and inadequate.

Both Xia and Nadia found using imagery more effective and easier than using verbal cues for recalling word meanings. For instance, Nadia stated:

I think for [a] picture, it's more the use [sic] of it to remember and it's easy to remember and for studying, it's easy, because the student, he make [creates] this picture and he can see the picture. For me, for much of the choice, it's easy. If I

see the meaning, I can use this, but sometimes, if you have a choice, you need to make it sometimes. It's easy to choose what's the exact answer and so, for me, it's easy. (Nadia, Interview, August 13, 2017)

Although Safiya too found using images to learn vocabulary extremely beneficial, she was concerned about the time needed to do so, as she believed that creating visuals could be time consuming.

If it will be the same way that you teach us with the images and everything, it will be easy. It will be easy because I really benefit, [sic] I know it forever now. But I don't have to [sic] time to go with the strategy that you show [showed] to [sic] us to learn like [sic] most of the vocabulary. [If] I have time, I will do it with the same, because I really benefit from it. It sticks in my mind, the picture. (Safiya, Interview, June 26, 2017)

Despite her concern for the time needed to exact an imagery-based strategy, for her, Safiya asserted that the words she learned using imagery were embedded in her mind and she perceived imagery to be extremely effective in recalling word meanings.

Tamryn regards imagery as an effective strategy specifically for visual learners. His favourable disposition towards the strategy was described as follows:

I think it is. It is very useful, especially for people who are visual learners. As we talk about this, I remember the images that I draw. And also, that she [Ksana] draw [sic]. A lot of the images I remember. Maybe not the word that was there, but the image. (Tamryn, Interview, May 26, 2017)

For Lina, using imagery posed several challenges in the initial stages of learning, however, once she understood what she was supposed to do, she found it to be a novel

and effective strategy. Although she felt, using both L1 equivalents and imagery were helpful, she thought the latter was comparatively more useful. The excerpt below outlines her views:

I think it helped, having the word translated in [to] my own language, and the picture that we drew. I think, I'm trying to think if I covered one of these, how is the feeling gonna be? Because I did the quiz with it but I think the images helped a lot. I mean, if they're blacked out, I believe I will take probably more time and add to that, the meaning in Arabic might be broad for the word itself, but with the picture, it's more specific. So, you know what I think. When you're looking at a picture, it's a whole context, you're looking at a whole sentence. So, if you can guess the meaning from the sentence, right, which is one of the strategies. So, having the picture is easier, it's easier than making a new sentence, to put in the vocabulary [sic]. So, absolutely. The images helped. (Lina, Interview, June 26, 2017)

In sum, for Lina, imagery facilitates a more accurate retrieval.

Although five of the respondents had a penchant towards the use of imagery, the other four ESL learner graduate students had reservations about its application as a general VLS. For instance, both Xiaoli and Mei found imagery to be effective for some words but not for others. Xiaoli stated that, "For others, it's not that useful because it's so abstract, it's difficult to describe it with [a] picture. It's difficult to see the relationship between the word and the picture" (Xiaoli, Interview, May 12, 2017). Providing an example of an effective imagery use, Xiaoli specifically mentioned the word "scheme," for which an image of a devious and calculating woman in Chinese folklore was used.

However, her general opinion was that, if the word is abstract, establishing the relationship between the word and an image will be challenging.

Mei expressed her belief that one's ability to recall the meaning of a word using imagery is determined by the relationship between the image and the word. For her, a clear relationship ensures more accurate retrieval. However, echoing Xiaoli's views, Mei too felt using imagery may not be the best way to recall meanings of abstract words.

I think it depends on how the image is related to the word. If it has [a] strong relationship, I think it is maybe not the best way but it is an efficient way for us to learn English. But for some words, especially the abstract words, it is difficult to draw an image to help you understand this, so I think this method may be more useful for the object. (Mei, Interview, May 5, 2017)

Although she wondered about the feasibility of using images as a strategy, Mei said she was encouraged to use images by the professors in her program.

For Ksana and Ahmed, imagery as a strategy was not personally meaningful, as they did not perceive themselves to be visual learners. Ksana verbalized her views on the use of imagery as a VLS the following way:

Researcher: Ok. Moving on to the strategies we used, right? What do you think about using imagery?

Ksana: For kids, that is very useful, when you show them a cat or dog or something. I remember that when we were in a museum and they were the name on the exhibition [sic] and I saw that and I remembered that, but I'm not usually the one with visualization. (Ksana, Interview, June 9, 2017).

In her views, using imagery would be more appropriate for younger learners in the acquisition of concrete vocabulary.

Ahmed, described his views on the use of imagery as follows:

Visual learning. I would pick it as second preferred way of learning. I prefer putting the word in a sentence with different meanings or different sentences. And being asked to practice it orally and use it rather than visualizing it, because I found it's very difficult to visualize some of these words or to create an image of them, so I find it would be difficult with some of the vocabulary. Maybe I'm not creative in creating a nice enough visual picture for the term.

(Ahmed, Interview, May 19, 2017)

As stated by Ahmed, using imagery would be his second preferred way of learning, as he would rather use the words to be learned in sentences (i.e., context) to remember them. Although Ahmed found the entire process of learning how to use imagery not very challenging, he pondered to what extent this strategy would allow him to use newly acquired words productively either in writing or in speech. He also stated that he had difficulty recalling the images during the quizzes and that he had to rely on the discussion as a memory aid.

Thus, in summary, it can be stated that five of the participants found imagery to be assistive while the other four had issues seeing the value of it as a VLS. Even though they found the strategy personally not meaningful, all four were of the view that it would be useful when learning concrete vocabulary words as opposed to abstract words.

Learners' Use of CRI

Of particular interest is the evidence of the participants' use (or lack thereof) of CRI to enhance their general academic vocabulary. The following presents detailed

descriptions of the findings from the observations during the intervention sessions and the transcripts from the semi-structured interviews.

A careful analysis of the images created by the respondents during the intervention sessions indicates that the images they created were culturally relevant to them. The relevance of each image was established by the participants when they explained to the researcher what each of the images meant and how they would serve as retrieval cues. These explanations were garnered by the researcher at the completion of each of the intervention sessions. It was noted that while all these images were culturally relevant, some in particular reflected concepts unique to certain cultures. Following is a description along with examples for each of these sub-types of imagery.

Culturally generic imagery. There were examples of the participants using culturally generic imagery that contained images that had cultural relevance but were not unique to one specific culture. For instance, the Chinese participants' use of the image of a highway exit to illustrate the word "deviation" is culturally relevant to them, but not unique to the Chinese culture. This was of relevance to these participants as highways are not an alien or an unfamiliar concept to them. However, there are certain countries, specifically small island nations like Samoa, that have no highway systems. Thus, the highway image may look and sound irrelevant to learners from such countries. At the same time, the image is not unique to the Chinese culture as highways are found in many other countries in the world. Similarly, Arabic L1 speakers' creating an image of trees being cut down to illustrate "diminish" is generic as it is a common occurrence all over the world. Figure 11 is a culturally generic image created by Arabic L1 speakers to depict the word "diminish."

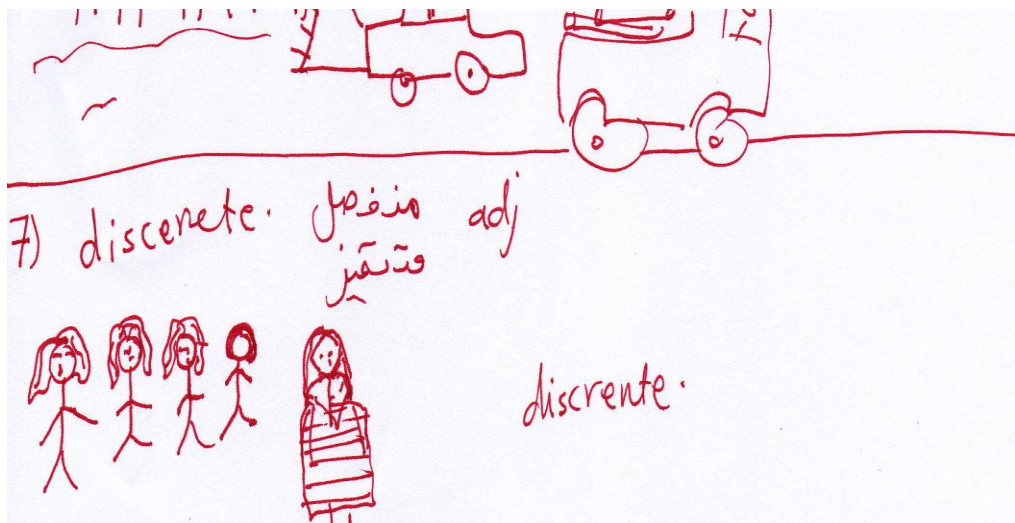


Figure 11: A culturally generic image depicting the word “diminish.”

Culturally specific imagery. On the contrary, culturally specific imagery contained images unique to one specific culture. For example, among the Chinese participants, the image created for the word, “scheme,” reflected the story of a wicked woman in Chinese folklore, who schemed and plotted a duel between two men. Figure 12 is a culturally specific image created by Chinese L1 speakers to depict the word “scheme.” In another instance, the Chinese L1 speakers drew from the popular Chinese culture to come up with an image to remember the word “Arbitrariness.” The following is their conversation about how they connect the word with a culturally relevant idea:

Xia: *Ba Dao* [“arbitrary” in Chinese]. For this word, we can draw a potent CEO. [Potent but charming CEO is a typical role in Chinese or Korean romantic TV drama, who usually falls in love in some ordinary, Cinderella like female employee in his company].

Xiaoli: Bossy CEO.

Mei: Huang Xiao Ming [a famous Chinese young actor who played the charming CEO in romantic dramas].

Similarly, the Arabic L1 participants, who were from Libya, visualized how the Libyan flag was changed from its past form to its current form to illustrate the word “amend.” Russian L1 speakers used a cart full of logs being pulled by a bull to illustrate the word, “exploit.” These images were unique to their cultures and demonstrated extremely strong connections they had with their respective cultures (see Tables 4, 5, 6, and 7 for a complete list of words and the type of images created). Thus, a significant finding from observations made during the intervention of the current study was a distinction between culturally generic and culturally specific imagery as forms of CRI.

project proposal due to a variety of reasons.

d. neutrality

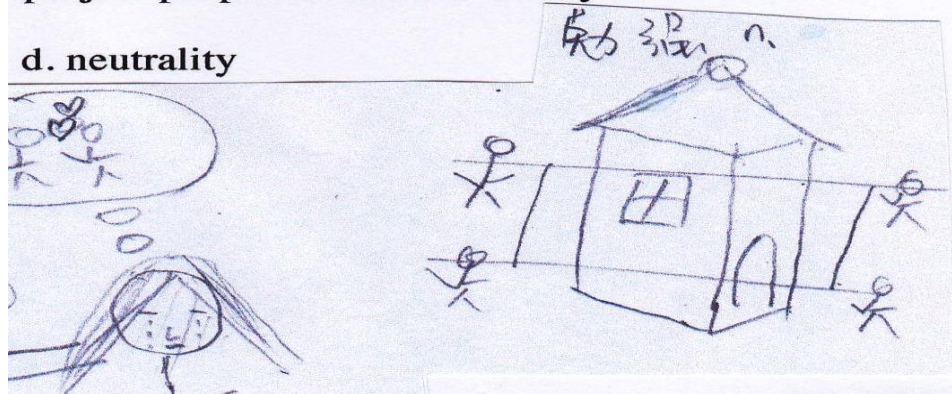


Figure 12: A culturally specific image depicting the word “scheme”

Table 4

Summary of Test Performance—Chinese L1 Speakers

Word	Image type	Mei			Xia			Xiaoli		
		IR	DR	CT	IR	DR	CT	IR	DR	CT
1. Scheme	Specific	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Reluctance	Specific	✓	✓	✓	✓	✓	✓	✓	✓	X
3. Regime	Specific	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Intrinsic	Generic	✓	✓	X	✓	X	✓	✓	✓	X
5. Empirical	Generic	✓	✓	✓	✓	X	X	✓	✓	X
6. Explicit	Generic	✓	✓	✓	✓	X	X	✓	✓	✓
7. Paradigm	Generic	✓	✓	-	✓	X	-	✓	✓	-
8. Preliminary	Generic	✓	✓	-	✓	X	-	✓	✓	-
9. Preceded	Generic	✓	✓	-	✓	✓	-	✓	✓	-
10. Sphere	Generic	✓	✓	-	✓	✓	-	✓	✓	-
11. Arbitrariness	Specific	✓	✓	✓	✓	✓	X	✓	✓	X
12. Interval	Generic	✓	✓	✓	✓	✓	✓	✓	✓	✓
13. Deviate	Generic	✓	✓	✓	✓	✓	✓	✓	✓	X
14. Neutralization	Generic	✓	✓	-	✓	✓	-	✓	✓	-
15. Confer	Generic	✓	✓	✓	✓	X	✓	X	X	X
Score obtained:		100%	100%	90%	100%	60%	60%	93%	93%	40%

IR: Immediate Recall Test (Multiple Choice)

DR: Delayed Recall Test 2 (Multiple Choice)

CT: Cloze Test (Delayed Recall Test 1)

Table 5

Summary of Test Performance—Arabic L1 Speakers (Group A)

Word	Image type	Ahmed			Safiya		
		IR	DR	CZ	IR	DR	CT
1. Perceive	Generic	✓	✓	✓	X	X	X
2. Amend	Specific	✓	✓	✓	✓	✓	✓
3. Discrete	Specific	✓	✓	✓	✓	X	X
4. Adequate	Specific	✓	✓	✓	✓	✓	✓
5. Attribute	Specific	✓	✓	✓	✓	✓	✓
6. Impose	Specific	✓	✓	✓	✓	✓	✓
7. Predict	Specific	✓	✓	✓	✓	✓	✓
8. Discriminate	Specific	✓	✓	✓	✓	✓	✓
9. Ethical	Specific	✓	✓	✓	✓	✓	✓
10. Trigger	Specific	✓	✓	✓	✓	✓	✓
11. Controversy	Specific	✓	✓	-	✓	✓	-
12. Commodity	Specific	✓	✓	-	X	X	-
13. Diminish	Generic	✓	✓	-	✓	✓	-
14. Advocate	Generic	✓	✓	-	-	-	-
15. Conceive	Generic	✓	✓	-	-	-	-
Score obtained:		100%	100%	100%	87%	80%	80%

Table 6

Summary of Test Performance—Arabic L1 Speakers (Group B)

Word	Image type	Lina			Nadia		
		IR	DR	CT	IR	DR	CT
1. indiscretion	Specific	✓	✓	X	✓	✓	✓
2. perceive	Generic	✓	✓	-	✓	✓	-
3. ethnic	Specific	✓	✓	-	✓	✓	-
4. concurrent	Specific	✓	✓	✓	✓	✓	✓
5. levy	Specific	✓	✓	✓	✓	✓	✓
6. constituent	Generic	✓	✓	-	✓	✓	-
7. ban	Specific	✓	X	X	X	X	X
8. revoking	Specific	X	X	-	✓	X	-
9. amend	Generic	✓	✓	✓	✓	✓	✓
10. underlies	Generic	✓	✓	✓	✓	✓	✓
11. commissions	Generic	✓	✓	-	✓	✓	-
12. brevity	Generic	✓	✓	X	✓	✓	X
13. erode	Generic	✓	✓	✓	✓	✓	X
14. imply	Generic	X	X	X	X	X	X
15. entity	Generic	✓	✓	✓	✓	✓	✓
Score obtained:		87%	80%	60%	87%	80%	60%

Table 7

Summary of Test Performance—Russian L1 Speakers

Word	Image type	Tamryn			Ksana		
		IR	DR	CT	IR	DR	CT
1. retain	Generic	✓	✓	-	✓	✓	-
2. deviate	Generic	✓	✓	X	✓	✓	X
3. reinterpretation	Specific	✓	X	X	✓	✓	X
4. equate	Generic	✓	✓	✓	✓	✓	✓
5. amend	Generic	✓	✓	-	✓	✓	-
6. deregulation	Generic	✓	✓	✓	✓	✓	✓
7. convene	Generic	✓	✓	✓	✓	X	X
8. discrete	Specific	✓	✓	X	✓	✓	X
9. exploit	Specific	✓	✓	✓	✓	✓	✓
10. incompatible	Generic	✓	✓	✓	✓	✓	X
11. aggregate	Generic	✓	✓	-	✓	✓	-
12. bulk	Generic	X	✓	-	✓	X	-
13. inhibit	Generic	✓	✓	✓	✓	X	X
14. intervene	Generic	✓	✓	✓	✓	X	X
15. append	Generic	✓	✓	-	✓	X	-
Score obtained:		93%	93%	70%	100%	67%	30%

Comparing CRI and imagery. The participants were asked to comment on CRI as compared to general use of imagery as a strategy. Almost all participants (except Ahmed) found CRI to be more useful than generic imagery in helping them recall word meanings. Each of the participants had unique insights regarding this. The findings suggest that when the participants used CRI they had established strong retrieval cues thereby supporting easy recall of words. This made learning vocabulary interesting and relevant and enhanced participants' engagement through prolonged discussion.

Xia aired her views on the type of imagery that she regards as most effective, "But you should be the [sic] more precise and the more unique, otherwise if you use a neutral picture, you will forget" (Xia, Interview, May, 26, 2017). According to Xia, a generic image may not have the same power to establish a connection between an image and a word that would later serve as a trigger to recall the word's meaning. Thus, in her opinion, images that are related to one's culture, due to their uniqueness and personal relevance, may be considered more effective triggers. She also felt that if the image the learner creates for a new word is related to something he/she is passionate about or interested in, it has a better chance of evoking the word's meaning. In the current study, she said she remembered all the words for which she and her partner created culturally relevant images. Verbalizing this, she stated, "I'm always interested in culture, so that's why I created a culturally-related picture. I can remember it. Once I create it, I can remember it" (Xia, Interview, May 26, 2017). Mei, Safiya, and Nadia sharing a similar sentiment believed that imagery derived from their own culture may facilitate efficient recall of the words to be learned. They articulated their opinions as follows:

If we can relate the words to our own culture, it is useful because we know our

cultures very good [sic] but we are more familiar with it, so we can know why this word is related to this [image]. (Mei, Interview, May 5, 2017)

I like it because we relate it to our traditional Libyan [culture]. This is more specific, more benefit [sic] to me. (Safiya, Interview, June 26, 2017)

Yeah. Especially the pictures for Libya, for me, it's useful and easier for me to use this vocabulary. (Nadia, Interview, August 13, 2017)

For Mei, thinking of cultural connections made learning vocabulary more interesting as it turned the otherwise boring task into a game. For instance, during the intervention, Mei, Xiaoli, and Xia turned the word “arbitrariness” into something that they could relate to and make fun of.

Moreover, the cognitive time spent on negotiating appropriate imagery also contributes to efficient recall of the meanings. Safiya felt that, in her case, the time spent on contemplating CRI ensured better and stronger memory connections.

Yes, 100%. That helped a lot. I told you. I'm this kind of person who shares with someone. We have a friend if you remember, we work together. So, when I answer the questions [in the recall tests], I remember the conversations I had with him. We create this image, how we make it specific, so I feel like, yeah, interesting. There is a scientific explanation for this. Five- eyes, listening- everything, we use it. As much as we use the five senses, you will remember it.

(Safiya, Interview, June 26, 2017)

Even though the creation of images was not viewed as entirely beneficial by Ahmed, he too claimed that he had recalled the peer discussions they had during the intervention when trying to answer the quizzes.

Although Ksana felt that a learner does not need to confine him/herself to the home culture while living in a different country, she perceived the idea of using CRI as interesting. In her view, letting learners use elements of their own culture may make them more comfortable learning a new language despite it being a challenge to establish strong connections between images and abstract vocabulary.

Tamryn observed that the appearance of certain objects varies from culture to culture. For instance, he illustrated his experiences and observations as follows:

In China, people draw this peach in some special way. Like it doesn't look like peach for me. But for them, it is [a] peach. So, if a teacher show [sic] this to me, I will never say it's [a] peach, but Chinese kids, Chinese people, they will get this is a peach. (Tamryn, Interview, May 26, 2017)

Furthermore, he stated that due to differences in pedagogical practices in different contexts, it would be impactful to let learners use the strategies they are comfortable with.

Then I think, yes. I think I need my own cultural journey to remember these words. At least, for the first stage, in the beginning. Because I also think that when students with their own cultural background, their own way of learning and they come to Canada and the teachers try to impose their own strategies, they are usually used by Westerners and there's so much pressure. Maybe they can introduce it slowly and use some of this different strategies [sic] and let them try, but if students are still learning better using their own cultural background, it is probably the best, I think. (Tamryn, Interview, May 26, 2017)

Under these circumstances, Tamryn believes if the learner lacks L2 cultural knowledge, letting him/her use elements of his/her own culture may prove to be more effective.

Although many of the participants agreed on the significance and the effectiveness of CRI, for Ahmed, using such imagery would be effective only if the learner has a strong affiliation to his/her home culture.

Ahmed: No, I found them equally helpful, to be honest. Equally. I didn't find the cultural one more- maybe because I'm not new here.

Researcher: Exactly. You are more bi-cultural.

Ahmed: Maybe for someone who's homesick, maybe the cultural one would have more impact. For me, I found them equal. Maybe because I've been here for so long. (Ahmed, Interview, May 19, 2017)

For Ahmed, the relevance of using CRI as a vocabulary learning strategy depends on the point where the ESL learner is at in the acculturation process.

The above findings suggest that most of the ESL learner graduate participants perceived the use of CRI as beneficial to their vocabulary learning process, especially when compared to general imagery use or other VLS. In response to Research Question 1(b), the ESL learner graduate student participants showed a preference to use vocabulary strategies that utilized their culturally relevant prior knowledge. This preference is attributed to their familiarity using their L1 during the intervention sessions where they worked with their L1 speaking peers to learn about the efficacy of culturally relevant imagery. Further, use of their L1 established both referential connections between verbal systems 1 and 2 and the image system, as well as associative connections within the verbal system 1. Participants noted the need for VLS to be personally meaningful, culturally relevant and easier to enact when vocabulary is concrete.

Section 3: Culturally Relevant Knowledge Facilitating Processing and Retrieval of New Words

Section 3 presents findings that respond to Research Question 2, To what extent does culturally relevant knowledge facilitate deep processing and retrieval of new vocabulary words in ESL learner graduate students? There were four groups of participants based on their L1 (Chinese; Arabic Group A; Arabic Group B; Russian). Data obtained from both quantitative (test scores) and qualitative (interviews) methods were analyzed to provide findings for Research Question 2.

Reported below are the participants' test scores and their perceptions regarding the efficacy of this strategy in deep processing and the productive retrieval of general academic vocabulary. Recall that the Immediate Recall Test (multiple choice) contained 15 words, which were randomly selected for administration (refer to Appendix B). The Delayed Recall Test 1 contained 10 items from the Immediate Recall Test in the form of a cloze test (refer to Appendix B). Delayed Recall Test 2 (Multiple Choice) was a repetition of Immediate Recall Test (multiple Choice). For each group of participants (Chinese, Arabic Group A, Arabic Group B, Russian), Tables 4, 5, 6, and 7 report on the tested words, type of images created, and the percentage of marks obtained for each individual participant (by name); each correct answer is indicated with a checkmark and incorrect answer with an "X" The columns are labeled "IR" for Immediate Recall Test, "DR" for Delayed Recall Test 1, and "CT" for Delayed Recall Test 2 (Cloze Test). Accordingly, Section 3 of this chapter will have five sub-sections: (1) Chinese L1 Speakers; (2) Arabic L1 Speakers—Group A; (3) Arabic L1 Speakers—Group B; (4) Russian L1 Speakers; and (5) Summary of Scores for all Participants.

Chinese L1 Speakers

Test scores. The Immediate Recall Test and Delayed Recall Test 2 contained four culturally specific images and 11 generic images. The Delayed Recall Test 1 contained four culturally specific images and six generic images. Table 4 summarizes the performance of the Chinese L1 participants.

All participants performed well in their Immediate Recall Test. Delayed Recall Test 1 results were comparatively lower for all three participants. While both Mei and Xiaoli performed well on their Delayed Recall Test 2, Xia's marks were slightly lower. Most of the errors that the participants made were for the words for which they had created generic images.

Interview findings. Findings derived from the Chinese L1 participants suggest contradictory evaluations on the perceived efficacy of culturally relevant knowledge in general academic vocabulary acquisition. For Mei, using culturally relevant knowledge was quite effective. When she was asked to rate the efficacy of it on a scale of 1 to 5, she rated it at 4.

I think it's interesting because before we maybe just to create [images for] ourselves. Sometimes but for a group we have the different [sic], although we have different opinions, but in this process, it also helped us to remember these words and we come up with the different images and then we combine them or just eliminate some. But for this process it helps us also to learn the words and also create a new method for us. Maybe in the future or in the other field, we can also use a similar method to learn. Because, for example, last term, our financial professor just told us to create images to give you a framework of the whole book,

so I think it's a similar way to learn the new words or review. (Mei, Interview, May 5, 2017)

Xia too found the strategy an interesting and an effective way to learn vocabulary. She claimed that transforming a word into an image is more effective than a lot of other strategies, and once the process of how it is done is figured out, it has great potential as a VLS.

I think it's interesting and effective way to learn English because first I'm interested in this study. I think, it helped, it very [sic] helped. I think, when you find some image, it's hard. The time you spent to figure it out, it's more effective. Like the first time I had to use and make the image in one minute and it's not helped. The more time you spend when you create the picture into the words, I think it's more effective. (Xia, Interview, May 26, 2017)

Xiaoli, on the other hand, showed only a somewhat positive disposition regarding the use of culturally relevant knowledge as a VLS, for she believed it could only be used with certain words:

Xiaoli: For some words, yes.

Researcher: For some words it is useful. Like what type of words?

Xiaoli: I remember the word, "scheme." Yeah. That was useful.

Researcher: So, for certain words.

Xiaoli: For others, it's not that useful. Because it's so abstract, it's difficult to describe it with picture. It's difficult to see the relationship between the word and the picture

Interestingly, Xiaoli said that she would still rate it at 4 on a scale of 1 to 5.

Arabic L1 Speakers—Group A

Test scores. For the Arabic Group A, participants' Immediate Recall Test and Delayed Recall Test 2 contained 11 culturally specific images and four generic images. The Delayed Recall Test 1 contained nine culturally specific images and one generic image.

Ahmed made no mistakes in any of the tests. In the Immediate Recall Test, Safiya made only one mistake each in both image categories. In the Delayed Recall Test 1, the same outcomes occurred. However, in the Delayed Recall Test 2, two of the mistakes Safiya made were for the ones she created specific images, the other one contained a generic image.

Interview findings. Safiya strongly believed that the combination of L1 and CRI has played a major role as retrieval cues for her:

Honestly, in my case, the combination [of L1 and CRI], I told you, I remember everything, the word, how we create the word first, how we find the translation word [sic], the Arabic word, then the conversation that helped me to create the image—I think the combination [is effective] for me. (Safiya, Interview, June 26, 2017)

On the contrary, Ahmed found that although the images made sense during the Immediate Recall Test, they did not during any of the Delayed Recall Tests. For him, this could be attributed to the quality of images that were created. He verbalized his thoughts on this as follows:

You come back and you say, “Is that my handwriting?” You know what I’m saying? So, I found, ok, sometimes I—wow, how did I create this image? This is

not the right image. It should be this way, you know what I'm saying, after you find the word and it clicks. And then, "Wait a minute? Why have I did [sic] this? This is not a good image. I could have done better." Yeah. So, really, the image you create, the skills of creating this image, and the way you talk about the world that day, it really affects the process, so that is critical for you to learn this term. If you don't have a good image, you're not creative that day, you're not thinking about it properly, you're hungry or whatever, you don't come up with a good image, you end up in trouble. (Ahmed, Interview, May 19, 2017)

Discussing to what extent a VLS based on culturally relevant knowledge would help deep processing of new vocabulary words, Ahmed stated the following:

One of the problems I found [is] that the image might give different meanings. I think, to me, I look at the image and sometimes it doesn't click, so it depends on your creativity on that day with the image. That's important. That's critical. If that day you're not good at creating the images, you're going to create a poor image. Later on, you find- this happens with us. Sometimes you heard something somewhere or you read something. A few months later, you come back, and it's like you've never seen it [before]. (Ahmed, Interview, May 19, 2017)

It is apparent that the image-creating process of the strategy depends on one's creativity on a particular day.

In sum, findings indicate that despite being speakers of the same L1, they perceived the efficacy of a VLS based on culturally relevant knowledge in different ways. Although Safiya found it effective, Ahmed noticed certain drawbacks in it specifically in relation to

creating a salient image. This suggests that learners are individuals regardless of a shared characteristic such as their L1, and in particular, images might be individually relevant to some learners more than others.

Arabic L1 Speakers—Group B

Test scores. The Immediate Recall Test and the Delayed Recall Test 2 administered to the Arabic L1 Speakers contained six culturally specific images and nine generic images. The Delayed Recall Test 1 contained four culturally specific images and six generic images. Table 6 summarizes the findings of the Immediate and Delayed Recall Test findings.

Both participants did well on the Immediate Recall Test but not as well on the Delayed Recall Test 1. In Lina's case, on the Delayed Recall Test 2, the errors that she made were for those words that they had created specific images. When looking at the summary of mistakes, it is apparent that she has made mistakes in both categories of images. Nadia's mistakes were quite similar to those of Lina's for the Immediate Recall Test and Delayed Recall Tests 1 and 2. When looking at the final outcome, it is evident that the greatest number of mistakes was made for the ones for which generic images were created.

Interview findings. Nadia asserted that she could remember the images more vividly than the Arabic equivalents, as she stated, "The test for me, sometimes it was difficult to remember with no picture, but the second one, it's easy for me" (Nadia, Interview, August 13, 2017).

Lina, who had a similar view, elaborated her thoughts about how she worked in her L1 to create and then recall images to understand vocabulary:

I think it helped, having the word translated in my own language, and the picture that we drew. I think, I'm trying to think if I covered one of these, how is the feeling gonna be, because I did the quiz with it, but I think the images helped a lot. I mean, if they're blacked out, I believe I will take probably more time and add to that the meaning in Arabic might be broad for the word itself, but with the picture, it's more specific. So, you know what I think. When you're looking at a picture, it's a whole context; you're looking at a whole sentence. So, if you can guess the meaning from the sentence, right, which is one of the strategies. So, having the picture is easier, it's easier than making a new sentence, to put in the vocabulary. So, absolutely, the images helped. (Lina, Interview, June 26, 2017)

In sum, both Nadia and Lina found images more effective and helpful in recalling words and their meanings as the images provided more contextual information than the L1 equivalents.

Russian L1 Speakers

Test scores. Three culture specific images and 12 generic images were selected for the Russian participants' Immediate Recall Test and Delayed Recall Test 2. Their Delayed Recall Test 1 contained three culturally specific images and seven generic images.

Both Ksana and Tamryn did well on the Immediate Recall Test, but Ksana had a very low score for her Delayed Recall Test 1. For Tamryn, the difference between generic images and culturally specific images was very small. In Ksana's case, the ones she could not recall were mostly the ones that they (Ksana and Tamryn) created generic images for. Overall, the greatest number of mistakes were made for the ones for which

culturally generic images were created.

Interview findings. In the interview, Tamryn asserted that the ability to carry out their discussions in their L1 during the intervention sessions enhanced their ability to create relevant images. He stated that being able to use his L1 facilitated his discussions with Ksana as they had a better capacity to discuss all relevant information (i.e., what type of an image would serve as the best retrieval cue with regard to a new word). This was Tamryn's sentiment post-intervention.

In his opinion, the images had been more helpful than the Russian equivalents as a memory aid. Tamryn also stated that the Immediate Recall Test and the Delayed Recall Test 2 tests were relatively easy as he could see the word options because it was a multiple-choice test. In the case of the Cloze Test, he found it a challenge to recall the English words.

The test itself? The multiple choice? I found it easy. It's easy. I can find out this word faster because I see the word- But the last word [test], filling in, it was difficult. I didn't remember all the words. I couldn't recall them. Maybe if I thought longer, it would [have] come up, but at once, I didn't recall. (Tamryn, Interview, May 26, 2017)

Ksana, who was learning German as a subsequent language at the time of the interview had an interesting insight to share.

Researcher: In learning vocabulary, what do you think about creating imagery or connecting it with something related to your culture and the use of the mother tongue?

Ksana: I could now connect it more with German, which I'm learning [these days]. It's definitely. I usually went [go] online, some cards for learning, matching pictures, because I'm still on that level so I need those visual and audio, everything.

Researcher: Because you are at a lower level where German is concerned.

Ksana: Even though I'm adult, I still use the different kind of strategy. And again, bringing in other languages that I already know, English and Russian translations. So, I'm using this, which is really helpful for me, double language books. I think it's kind of illegal stuff in Russia. There's one side of the page with German that I'm reading and the other side is in Russian. And the same, so you could just check the words you don't know. Also in Kindle, you can just press and the word immediately shows. But for me, again, it is not useful to learn words but [I need to] to use collocation and make sentences. So, yeah, I found for myself this really useful strategy. (Ksana, Interview, June 9, 2017)

According to Ksana, she could very easily connect this culturally relevant VLS with learning German as she is still in a stage where she needs both audio and visual input. She also emphasized the importance of utilizing other languages in one's repertoire when learning a subsequent language.

Summary of Scores for all Intervention Participants

Table 8 provides a summary of test scores across all nine intervention participants. Overall, participants' performance on the Immediate Recall Test (multiple choice) was better than that of the Delayed Recall Tests (Multiple choice and cloze). It is worth noting that the average scores for the Immediate Recall Test (multiple choice) and Delayed Recall Test 2 (multiple choice) are somewhat stable indicating little

Table 8

Summary of Test Scores

	Immediate Recall Test (multiple choice)	Delayed Recall Test 2 (multiple choice)	Delayed Recall Test 1 (cloze test)
Xiaoli	93	93	40
Mei	100	100	90
Xia	100	60	60
Safiya	87	80	80
Ahmed	100	100	100
Lina	87	80	60
Nadia	87	80	60
Tamryn	93	93	70
Ksana	100	67	30
Average score:	94	90	65

attrition in performance. Additionally, Delayed Recall Test 2, which is a repetition of the Immediate Recall Test, seemed to be comparatively better than the Delayed Recall Test 1 (cloze test) performance. The test results echo the participants' views on the difficulty level of each test and the nature of the types of questions (selected response versus open response).

Table 9 summarizes the overall average score (for all three tests: IR, DR, CT) obtained by each group of participants against the number of culturally specific images created by them. The table indicates that the lowest percentage mark was obtained by the group with the least number of culturally specific images, while the highest percentage was obtained by the group with the greatest number of culturally specific images. Interestingly, although the Chinese L1 speakers had a fewer number of culturally specific images than the Arabic (B) participants, their test score average was higher than that of the Arabic (B) group's average. Taken together, these findings point to the result that the participants who utilized the culturally specific images had the greatest recall and retention of the words they learned.

Section 3 has presented the data that describes how each the four groups of L1 speakers (Chinese; Arabic - Group A; Arabic – Group B; Russian) who were ESL learner graduate participants performed as a function of an intervention that engaged their culturally relevant knowledge to process and retrieve vocabulary. The findings address Research Question 2 by suggesting that the intervention participants who maximized use of culturally specific images to process and learn vocabulary had the greatest recall and retention of the vocabulary.

Section 4: Collaboration

Section 4 presents the findings that relate to the nine intervention participants' impressions of collaboration on their learning of culturally relevant VLS. Section 4 presents findings that respond to Research Question 3: What are the experiences of ESL

Table 9

Average Test Scores for all Three Tests Against Culturally Specific Imagery

Group	Average score obtained for all 3 tests	No. of culturally specific images
Russian	75	3
Chinese	83	4
Arabic A	91	11
Arabic B	76	6

learner graduate students in using culturally relevant knowledge as a vocabulary learning strategy in a collaborative learning setting? Five sub-sections describe collaboration: (a) Initially Determining Word Meanings; (b) Negotiating Meaning Together; (c) Aiding Retrieval During Quizzes; (d) Working Independently to Create Images; and (e) When Working Independently is Preferred.

Collaboration: Initially Determining Word Meanings

Some compelling findings were extracted from the analysis of the observations made during the interventions that each of the four L1 groups of participants engaged in. In the initial stages of the intervention, there were frequent instances where participants discussed and collaborated with each other in determining word meanings and learning additional information such as a word's part of speech. Given below is how Lina defined the meaning of the word "perceive" to Nadia, who had difficulty understanding the meaning:

Nadia: Let's first find the meaning in Arabic.

Lina: Perceive is one, to feel or realize, two is to grasp or consider.

Nadia: Keep it as to realize, it's a verb. To feel or to realize.

Lina: Perceive is to feel or to realize. It is to sense with your heart.

The assistance Nadia received from Lina helped the former understand the meaning of the target word.

Another noteworthy observance was that in several instances, the participants went beyond the target word and explored its synonyms and part of speech. This is an example of making associative connections within the same verbal system (Refer to Figure 2) where the participants discussed derivations and parts of speech of a target

word. The following extracts illustrate two such instances between Safiya and Ahmed, and Lina and Nadia.

Safiya: What about this one?

Ahmed: Conceive?

Safiya: Conceive is a good word.

Ahmed: Which one? The adjective, the noun, the verb?

Conceivable? The adjective?

Safiya: Consume? Does it mean consume?

Ahmed: No, no, no.

Safiya: Write the verb, write the verb, conceive, don't write conceivable.

Nadia: Underlie is a verb?

Lina: Yes.

Nadia: "ie"?

Lina: Yes.

Underlay is past tense.

Nadia: Underlain is clearly the adjective.

Lina: No, adjective is underlying, underlining assumptions.

Collaboration: Negotiating Meaning Together

There was evidence to indicate that collaboration enriched the vocabulary learning experience of the participants, as during the intervention activities they were able to assist each other. Collaboration among group members enabled them to arrive at conclusions based on negotiations. For example, there was a great deal of discussion involving negotiations when deciding on an image that would serve as an effective

retrieval cue in recalling the target words. Below is a discussion that illustrates how Xiaoli, Xia, and Mei agreed on a culturally relevant image to represent “regime”:

Xia: How about we use some sign or symbol to represent government system?

Please think about how to use an image to show it.

Mei: How about the national emblem?

Xia: I can't draw the national emblem, it is too complicated for me to draw.

Xiaoli: How about something like a big circle with some small balls/circles below?

Xia: Oh, no [laughing], that's too abstract to understand.

Mei: What about Tian An Men? [Tian An Men is a famous Chinese building representing the center of government]

Xia: I can draw the Tian An Men.

Tamryn saw certain advantages of working together and liked the idea, as he believes the negotiations, especially while creating images, were helpful in remembering word meanings. Both Lina and Nadia found collaboration helpful, especially in instances where one struggled with an idea. In such situations, others can help complete ideas, make suggestions and point out deficiencies. Both of them found working together enjoyable. Lina also believed that the time spent on the task is crucial for better retention. During her interview she expressed that, if done independently, the time spent on determining images might have been minimal, and might have led to weaker memory connections:

When we worked together, as I said, it's better. You have one side and the other person will finish the whole picture. But sometimes, when we start visualizing

things, sometimes I have to stop and thinking [sic] about it first because this is part of thing [sic] in order to be able to learn and hold the vocabulary, because you stop and think about it. If it is one person, I believe it will be seconds, but with two people you have to stop and think about it, so I think it's more effective. I mean, I think it's good. Very good. I learned through that. (Lina, Interview, June 26, 2017)

Elaborating on the benefits, Safiya claimed that being a sociable person, she enjoyed and benefitted from collaborating, and that the interactions helped her learn better. She believes, as this process required the involvement of all five senses, there was deeper engagement:

Yes, 100%. That helped a lot. I told you. I'm this kind of person who shares with someone. We have a friend if you remember, we work together. So, when I answer the questions, I remember the conversations I had with him. We create this image, how we make it specific, so I feel like, yeah, interesting.

There is a scientific explanation for this. Five- eyes, listening- everything, we use it. As much as we use the five senses, you will remember it. If you lose focus here. (Safiya, Interview, June 26, 2017)

Mei too thought that there were certain advantages in collaborating because the entire process of creating images and ascertaining L1 equivalents together entailed choosing the best option that would serve as a trigger to recall word meanings. Thus, the entire process of agreeing, disagreeing, and making compromises had been helpful to remember the relationship between the words and the images:

Although we have different opinions, but in this process, it [discussions] also helped us to remember these words and we come up with the different images and then we combine them or just eliminate some but for this process it helps us also to learn the words and also create a new method for us maybe in the future or in the other field, we can also use a similar method to learn. (Mei, Interview, May 5, 2017)

However, at times, Mei found group work a distraction and wondered whether working alone would have yielded better results.

Although Tamryn, Lina, Safiya, and Mei believed creating images should be personal, each of them expressed positive aspects of working together with their L1 peers in a collaborative learning setting. Below Tamryn and Mei describe the positive outcomes of working with a peer. Nadia too added her comments about working together as more beneficial than working alone.

It's more fun with somebody else. It's not only fun but it's, you know, maybe it's, it's also easier to remember. Why? Because when you talk and when you discuss, what should you draw? So, maybe we came up with different ideas but I like her idea more. Yeah, I think your idea, your image is better. For example, we discuss and that is better. (Tamryn, Interview, May 26, 2017)

At the beginning when I am starting to learn new words, I prefer to study by myself and then after maybe you have learned hundreds of new words, I think it's better to study with others, whether to use them to talk to one another or to ask them to help explain to you so you can remember. (Mei, Interview, May 5, 2017)

No. It's easy and effective with another student because you remember, and you were laughing and you remember. (Nadia, Interview, August 13, 2017)

The above examples illustrate several instances where the participants collaborated to achieve a variety of purposes. They were negotiating to arrive at the best conclusion, discussing other relevant information pertaining to a word and helping their peers to understand the meaning of a word.

Collaboration: Aiding Retrieval During Quizzes

Another crucial finding that was relevant to the retrieval of word meanings was the role played by discussions during the intervention sessions. Interestingly, during their interviews, Mei, Tamryn, Nadia, Ahmed, Lina, and Safiya attributed their performance on the tests to the collaborative discussions that they had with their peers. Apparently, discussions played a major role in aiding the retrieval of vocabulary word meanings during both Immediate and Delayed Recall Tests.

Ahmed explicitly stated that in order to find answers to items on the quiz, he drew on the conversations he had with his L1 peer, Safiya. At times, although he feels it is better to work alone as sometimes it is difficult to agree on a common image, Ahmed perceived the discussions that he had with his peer were the most helpful when recalling word meanings:

Maybe some of the discussion we have to create an image. Sometimes moving in this direction, that could be helpful. Let's do this. Let's do that. This discussion maybe I speak, I use it, during the quizzes the images didn't, so I have to recall the discussion with Safiya to see, ok, did we- what we talked about to create the image. (Ahmed, Interview, May 19, 2017)

For Ahmed, he felt the longer they spent deciding on an image, the stronger the memory connection was.

Collaboration: Working Independently to Create Images

During the interviews, the nine ESL learner graduate students who had participated in the intervention aired several views regarding collaboration during the sessions. Most expressed that they preferred working alone specifically when creating images. They expressed the common belief that the images should be of personal relevance, hence should be personally created.

Xia found having to work in a group during the intervention was frustrating at times for two reasons: first, a single word may evoke different images in different people and, secondly, images are often personal to the one who creates them. Given below is an excerpt from her interview where she elaborated on these two reasons:

Yes. So, I found when I participate in this study, the image I created is the most effective. But when it comes from another one's idea, it's not that effective. I think the image from my idea I can remember it and I don't spell it wrong. I think it's more effective to use your own image, not other's. Even like the group, I think it's not that help [sic]. Sometimes you have to do some compromise and sometimes it's frustrating. It's hard and sometimes I'm not helping. Because we feel the word and we feel the same thing differently [sic].

Interpret it totally different, so that's why. (Xia, Interview, May 26, 2017)

Xia stressed the importance of creating one's own imagery rather than borrowing the images of others as she felt the former would be more deeply embedded in the memory than the latter. For the current research, as creating images was a collaborative activity, she said that she had to force herself to remember the images created by others.

Xiaoli and Lina resonated similar sentiments, as they believed what triggers one to recall a word meaning may not work for another. Lina explained this in her interview:

I would say if someone created it [an image] on his own, that would be more closer [sic] to his thinking, right, because people think [in] different ways. What reminds you of something might not remind me of anything or might remind me of something else. (Lina, Interview, June 26, 2017)

For Tamryn self-created images were more useful as his own experiences were reflected in them, thus making it more personal, “Yes, especially when I draw them myself. I do remember her, one or two, two pictures that she draw [sic]. Others, I remember those that I do myself. So, as a kinetic experience, it is better probably.” (Tamryn, Interview, May 26, 2017)

Collaboration: When Working Independently Is Preferred

In the open-ended interviews, participants were asked to broadly comment on collaboration during learning. Three of the participants (Xia, Ksana, Safiya) were candid in their comments with respect to their preference to work independently in general. For example, Xia saw herself as having a quiet, reserved personality and as a result, perceived that working in groups is quite challenging for her. For instance, she stated, “I prefer most of work to be alone. That’s why I choose finance because [in] finance, all the [sic] exams, there is no group work. I don’t like group work” (Xia, Interview, May 26, 2017).

Similarly, Ksana disliked collaborating, as she dislikes working with people in general. In her view, “It is really rare that there is someone who will work on the same level and speed and I could read and work and do five different things all in one time” (Ksana, Interview, June 9, 2017).

Safiya, too, ascertained that she preferred working alone rather than relying on

others.

I'm not sure why. I'm a social person, but even though I feel like I'm doing great if I'm sharing with someone else ideas, conversations, try to study with someone, I'm not sure from my beginning stages even in my country, I'm very good if I'm with someone else [sic]. I do it perfect [sic]. But here it's hard to do it [create images] with someone else. (Safiya, Interview, June 26, 2017)

She felt that being a graduate student, she would find it more effective if she worked on her own. However, she feels that with younger children, working in groups would be more beneficial and interesting.

Section Four of this chapter has presented the participants' impressions of collaboration on their learning of culturally relevant VLS. Findings indicate that the participants have mixed feelings regarding collaboration in learning words. Collaborating with a peer was instrumental in determining word meanings and parts of speech together and then together negotiating the details of culturally relevant images was assistive. Several participants stated that the conversations they had with their L1 peers during the intervention facilitated word and meaning retrieval during the quizzes. As the task entailed creating imagery, they found collaboration an issue, as they believe the images they create should be personally relevant to them. Additionally, many felt working in groups is engaging despite the distraction it created.

Summary of Findings

Findings suggest that the participants found high frequency general academic vocabulary to be the biggest challenge to academic writing. Thus, learning vocabulary was considered a stressful activity even though they were all aware of its significance. In responding to Research Question 1(a) regarding the currently popular VLSs among ESL learner graduate students, it was found that due to lack of prior experience in explicit

instruction, their VLS use was limited to traditional strategies such as dictionary use. Most significantly, using L1 and imagery were rarely employed in their vocabulary learning.

With regard to Research Question 1(b) the participants showed a preference to use vocabulary strategies that utilized their culturally relevant knowledge. This preference stemmed from their familiarity with their L1 and culturally relevant imagery. Further, use of their L1 established both referential connections between verbal systems 1 and 2 and the image system, as well as associative connections in the verbal system 1. Participants perceived the need for VLS to be personally meaningful and relevant to maximize vocabulary uptake.

The findings pertaining to Research Question 2 suggest that the intervention participants who maximized use of culturally specific images as opposed to culturally generic imagery to process and learn vocabulary, had the greatest recall and retention of the target words.

Findings for Research Question 3, which entailed the participants' impressions of collaboration on their learning of culturally relevant VLS, indicate that the participants have mixed feelings regarding collaboration in learning words. Collaborating with a peer was helpful in determining word meanings and parts of speech and negotiating the details of culturally relevant images. Some of the participants stated that the conversations they had during the intervention facilitated word and meaning retrieval during the Delayed and Immediate Recall Tests. Since the task entailed creating imagery, they found collaboration somewhat problematic, as they were of the view that the images they create should be of personal relevance to them. However, many felt collaboration assistive despite the distraction it sometimes created.

In the next chapter, the findings from all of the research questions are discussed in detail in light of the literature and their implications in teaching and learning vocabulary learning strategies. Additionally, implications for future research are also discussed in the next chapter.

CHAPTER SIX: DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

The current study aimed to explore how English as a Second Language (ESL) graduate students who self-identified as ESL learners collaborate with their peers who share the same First Language (L1) to use culturally relevant knowledge to facilitate deep processing and retrieval of new vocabulary. In order to address this purpose, three research questions examined the vocabulary learning strategies (VLS) among ESL graduate students, their preference to use culturally relevant knowledge in vocabulary learning as a strategy, the extent to which such a strategy would help deep processing of new general academic vocabulary words, and their experiences in collaborating with their peers to use a VLS that utilizes their culturally relevant knowledge. Since culturally relevant knowledge in this study referred to the learners' use of L1 and culturally relevant imagery, Research Question 1 was informed by the Bilingual Dual Coding Theory (Paivio & Desrochers, 1980), which proposes that the cognitive activity of the bilingual is mediated by the bilingual's two verbal systems and the image system. Research Question 2 examined how such a strategy would assist with the deep processing of new target vocabulary; this research question was informed by the Levels of Processing Theory (Craik & Lockhart, 1972). Finally, since the application of this VLS was carried out in a collaborative learning setting, Vygotsky's (1978) social constructivist theory informed Research Question 3.

In response to Research Question 1, a modified version of Gu and Johnson's (1996) *Vocabulary Learning Strategy Questionnaire* (VLSQ) was administered to a large ESL graduate and undergraduate student population. Then, the researcher worked with a small sample of ESL learner graduate students to explore the efficacy of a VLS that

utilizes their culturally relevant knowledge. In this phase of the study, an intervention, which was followed by vocabulary tests, enabled the researcher to collect evidence regarding the efficacy of the VLS. Finally, interviews were conducted to gather the participants' perceptions regarding the use of their L1, culturally relevant imagery and collaboration during the intervention.

This study was conducted using a sequential explanatory mixed methods research design. For the first phase of the study, there was an administration of a VLSQ to gather quantitative data from a large student sample. The data gathered during this phase helped in selecting participants for the more qualitatively oriented second phase, which entailed an intervention. This sequential explanatory mixed methods design provided the opportunity for the researcher to further explore additional research questions and derive findings based on a small intervention sub-sample of participants. Finally, the intervention phase of the study was conducted using a case study approach due to its ability to explain phenomena (Rowley, 2002).

Previous studies on VLSs have mainly focused on how the use of VLSs impacts the breadth and depth of vocabulary of ESL learners. However, no studies have looked at how ESL learners' L1 along with culturally relevant imagery can be combined to develop a VLS that leads to deep processing of new vocabulary words. Thus, this chapter contains a discussion about: how vocabulary contributes to effective communication in ESL learner graduate students; issues pertaining to current VLS use that justify the need for a more socio-cognitively compatible VLS; culturally relevant knowledge and the adult learner; and attitudes towards collaboration in vocabulary learning. Chapter 6 concludes with a presentation of the implications for theory, practice, and future research.

Discussion of the Findings

The current study was informed by four theoretical frameworks: Paivio and Desrochers's (1980) Bilingual Dual Coding Theory (BDCT); Craik and Lockhart's Levels of Processing Theory (1972); Gu and Johnson's (1996) taxonomy of VLS; and Vygotsky's (1978) Social Constructivist Theory. Using these theoretical perspectives, the study sought to determine how a vocabulary learning strategy that utilizes the socio-cognitive resources of the ESL learner might help deep processing of vocabulary acquired in a collaborative learning setting. The following section is a discussion of the findings that responds to the three research questions of the current study. The first part of the discussion presents the participants' views on general academic vocabulary as a barrier to effective communication and seeks to justify the need for more robust VLSs that enhances both receptive and productive general academic vocabularies of ESL learners.

General Academic Vocabulary as a Barrier to Effective Communication

Findings from the current study suggest that there are a variety of issues pertaining to vocabulary that seemingly caused the participants learning challenges and hindered their ability to understand others and express their thoughts. Findings indicate that these problems may have emerged as a consequence of three pre-existing general realities. Firstly, most of the ESL learner graduate student participants' education had been conducted in their vernacular prior to coming to Canada. Secondly, for the participants, English was learned as a foreign language (as opposed to English as a second language), which reduces the status of English to a classroom subject with no authentic use outside of the classroom. Thirdly, the traditional pedagogical practices that

the participants were exposed to in the ESL classrooms in their respective countries potentially negatively impacted their learning processes. These three pre-existing realities have likely contributed to the inadequacies in vocabulary learning that the participants encountered in the Anglophone classroom and contributed to barriers to academic achievement. As well, this is consistent with the view purported by Olivas and Lee (2006) that the current linguistic abilities of many ESL learners are inadequate (based on their background) for them to successfully engage in their academic activities.

In the current study there were additional challenges expressed by the participants that related to learning specific vocabulary. Previous researchers (e.g., Nation, 1990; 2001; Takač, 2008; Webb, 2005) have noted vocabulary-related challenges inherent in the complexities associated with the semantics, register, collocations, phonology, and orthography of many words. The participants found that learning the semantics of words challenging. In addition, they found learning a word's collocations, register, and orthography also to be problematic mostly in relation to Tier Two (Beck et al., 2002) general academic vocabulary. None of the participants found discipline specific, Tier Three (Beck et al., 2002) vocabulary words to be a challenge because those are taught explicitly within their academic programs. The reason for this is because Tier Two general academic vocabulary (e.g., "analyze," "subtle," "conditional," "underlie"), which is cross disciplinary in nature and is of high utility to adult language learners (Beck et al., 2002) in higher education, is often not explicitly taught by either subject teachers or ESL teachers. The learning of Tier Two vocabulary becomes an arduous task because these words do not often play a prominent role in academic content. Specifically, Tier Two words support the main content, but are often not the focus of discipline-based concept

instruction (Coxhead, 2006; Nation, 2013). Even during didactic instruction of vocabulary, these Tier Two words are not given adequate attention.

Due to the magnitude of vocabulary at a post-secondary level, neither ESL instructors nor discipline-specific professors can explicitly teach all the words needed to communicate proficiently in the classroom; vocabulary needs to be independently acquired. In order to do so, students should be equipped with robust VLSs that facilitate long-term retention of words. However, findings indicate that the current VLSs employed by ESL learner students are of little help in terms of long-term retention of new vocabulary and instead, VLSs are mostly employed to temporarily overcome barriers to reading comprehension. Collectively, the lack of explicit attention given to the teaching of general academic vocabulary and the lack of VLS knowledge leading to robust vocabulary development in learners may contribute to ESL learner students' insurmountable difficulties. In the current study, ESL learner graduate students' perceptions and attitudes regarding vocabulary learning as something "extremely frustrating" or "overwhelming" could be attributed to the above reasons. However, it is noteworthy that the ESL learner graduate students were motivated to enhance their lexical competence to achieve academic excellence despite the challenges they faced.

The above findings echo the long-standing views of Nation (1990, 2001), Takač (2008), and Webb (2005) regarding the complexity of vocabulary knowledge and the barriers to learning that it causes. As well, the finding that there are gaps in ESL learner graduate students' vocabulary knowledge appears to be a significant barrier to their effective communication. This is consistent with the view that a lack of lexical competence contributes to poor academic advancement especially in ESL students at

higher education institutions (Astika, 1993; Coady, 1993, Laufer, 1997; Yang & Dai, 2011).

Issues and Concerns Regarding Current VLS Use

According to the questionnaire findings of the current study, it is evident that ESL students employed a variety of VLSs to overcome vocabulary related issues. This is similar to findings from over a decade ago (Takač, 2008). An analysis of the current VLS use of the large sample of students indicates a predominance of passive strategies (Gu & Johnson, 1996) such as dictionary strategies, oral repetition, technology-based strategies, which mainly involved referencing online dictionaries, guessing, and contextual encoding. Most of these strategies contribute to supporting students to overcome the challenges of vocabulary by offering instant and temporary solutions. None of them offered long-lasting solutions that would help them retain a new word and its meaning for a prolonged period of time. These passive VLSs were mainly utilized to determine word meanings. This resonates with the recent findings of Huong (2018), Reza and Heshmatifar (2013), and Tanyer and Ozturk (2014). Also, none of the ESL students fully utilized their existing culturally relevant resources (except in the use of bilingual dictionaries), which could be of immense assistance given that when the elaboration of information is engaged a learner can make more personalized connections in facilitating vocabulary acquisition.

The popularity of VLS strategies such as dictionary use and guessing strategies among the ESL learner graduate students may indicate that they are more interested in seeking temporary solutions to overcome obstacles to immediate reading comprehension rather than employing more robust strategies requiring deeper cognitive involvement to

achieve long term lexical retention. In other words, the current strategies are more like discovery strategies than consolidation strategies (Reza & Heshmatifar, 2013; Schmitt, 1997, 2000). As well, these currently popular strategies can also be classified as non-mnemonic and hence entail little cognitive involvement (Paivio, 1983; Roediger, 1980; Takač, 2008) resulting in shallow processing of information (Craik & Lockhart, 1972). There is no elaboration of information when a bilingual or a monolingual dictionary is used to temporarily remove a barrier that impedes reading comprehension. Similarly, guessing a word's meaning involves no elaboration of information and is used in a similar manner to dictionaries. Moreover, information processed at such shallow levels decays from memory easily (Craik & Lockhart, 1972) and does not lead to long term retention of information.

The popularity of the above-mentioned passive strategies could be attributed to the participants' lack of knowledge regarding the wide variety of strategies available to them. Simply, the participants may not know what they do not know; as well, they may lack explicit instruction in VLSs. Interestingly, passive strategies in vocabulary learning are used mostly by less advanced language learners (Nemati, 2008; Rahimy & Shams, 2012; Tsai & Chang, 2009); this current study focused on participants in higher education.

Unlike other passive strategies, contextual encoding, another popular strategy among both questionnaire respondents (Phase 1) and intervention participants (Phase 2), may yield positive results provided that the learners are faced with frequent encounters with to-be-learned vocabulary items. However, it should be noted that according to the Lexical Threshold Hypothesis, for this strategy to be effective, a learner should have the

ability to comprehend at least 95% of the vocabulary in a text (Laufer, 1989; Liu & Nation 1985; Nation & Waring, 2004). Therefore, even though many of the participants stated that they used contextual encoding, the extent to which they could employ this strategy either as a discovery or a consolidation strategy is highly questionable.

It is certain that participants were not fully aware of the impact of their L1 use in vocabulary learning. A closer examination of the current VLS use and beliefs regarding vocabulary demonstrates that approximately 50% of the questionnaire respondents believed their L1 was an important resource in helping them determine the meanings of unfamiliar words. Similarly, all but two intervention participants also perceived their L1 to be an important resource in L2 vocabulary learning. Yet, stating that L1 use is helpful in vocabulary learning is one thing, knowing how to use L1 in VLS is another matter. Clearly, the use of L1 warrants a deeper analysis, and hence, is discussed in the next section in more detail.

The Use of L1 in Vocabulary Learning

An individual's L1 is a quintessential element in his/her culturally relevant knowledge. In the current study, three different participant perspectives on the use of L1 emerged from the findings. Firstly, a significant number of participants considered their L1 to be a potential resource in L2 learning, specifically in relation to L2 vocabulary acquisition. Secondly, there were a few other participants who perceived their L1s to be of little use in L2 vocabulary learning. Thirdly, there were some other participants who made a deliberate attempt to keep the two languages separate from each other irrespective of their beliefs about the use of L1 for L2 vocabulary learning. Despite these differences in their expressed perspectives, previous research suggests that L1 lexical transfer occurs

on all dimensions of vocabulary knowledge (Arabski, 2006; Jarvis & Pavlenko, 2008) and that a multilingual's language systems are not discrete and separated (Canagarajah, 2011). Most importantly, as purported by the Bilingual Dual Coding Theory (Paivio & Desrochers, 1980), referential connections are constantly made between a bilingual's two verbal systems when information is processed. Thus, based on the above evidence, it can be assumed that the L1 influence on L2 vocabulary learning could be both intentional and unintentional. As well, the L1 influence on L2 vocabulary learning can sometimes be inevitable due to how the cognitive activities of the bilingual brain are mediated even if some learners' attempt to keep their two languages separate.

The finding that 61% of the questionnaire respondents linked new L2 words to their L1 equivalents is supported by previous studies. Specifically, in the initial stages of new L2 vocabulary acquisition, ESL learners may unintentionally rely on their L1 to fill the voids of knowledge in meaning and syntax of new words in their mental lexicons (Jiang, 2000). In the current study, many participants showed a preference to use bilingual dictionaries, as they considered this to be a time effective and meaningful method, which allowed them to see L1 translation equivalents of unfamiliar L2 vocabulary. This was indicative of the common practice of ESL students making a conscious decision to use their L1 in L2 vocabulary learning.

This concurs with Jiang's (2002) claim that, "L2 lexical forms are often mapped to the existing semantic content of their first language translations rather than to new semantic specifications of their own" (p. 617). Jiang (2000) identifies this stage, which entails a high degree of reliance on the L1, as the lexical mediation stage. The participants' view of L1 as a facilitator in L2 vocabulary acquisition is linked to its ability

to reduce the complexity inherent in L2 words; this is also supported by Jiang's (2000) three-stage psycholinguistic model of adult vocabulary acquisition. As purported by Jiang (2000), when a new L2 word is registered in an individual's mental lexicon, it may contain only phonological /orthographical knowledge. The mental lexicon space allocated for syntactic and semantic information may be filled by L1 information pertaining to this new L2 word. Similarly, both Kern (1994) and Paivio (2014) argue that the use of L1 in the form of a mental translation is possibly inevitable, especially for L2 learners who are in the early stages of learning. The findings of the current study also confirm Jiang's (2000), Paivio's (2014), and Kern's (1994) views as there was a significant reliance on L1 among both questionnaire and interview participants. As the majority of the respondents were from countries such as China and Libya, where English is spoken as a foreign language (refer to definition of key terms in Chapter 1), there are likely many gaps in their general academic vocabulary knowledge due to inadequate opportunities to interact with English. In such situations, as purported by Jiang (2000), their L1 serves to bridge gaps in crucial knowledge pertaining to new words.

As stated above, using L1 translation equivalents also provides the adult ESL learner with a meaningful way to determine the core meaning of a word. Grabe and Stoller (1997) add that, "Perhaps, for adults, there are times when it is important to know that a word is understood accurately" (p. 114). L1 translation equivalents have the ability to provide the learner with an accurate meaning, which may also serve as a "cognitive hook to hang the new item on" (Fraser, 1999, p. 238). This provides a possible explanation as to why the majority of the questionnaire respondents (Phase 1) and the intervention participants (Phase 2) used bilingual dictionaries. Their preference to use

bilingual dictionaries could be attributed to the fact that “translation equivalents appear to have a different and closer cognitive status than within-language synonyms” (Francis, 2005, p. 251). When adult learners are presented with simplified definitions of complex target vocabulary, they may not still fully understand the exact meaning of the target word because simplified definitions may be inadequate in conveying a word’s precise meaning. Providing simplified explanations or definitions of L2 target words could impede the learners’ productive use of them as he/she may not have a clear idea with regard to the context in which they can be used. Instead, if a particular complex target word does possess a precise L1 translation equivalent, accessing it could be regarded as an effective way learn the target word’s meaning. Hence, it is imperative to rethink whether devising strategies to circumvent translation equivalents is advisable or not.

The above explanation resonates with Arabski’s (2006) observation of a high level of connectivity between L1 and L2 mental lexicons and Kaushanskya and Marian’s (2009) view on bilingual advantage in the retrieval of lexical information. The latter view purports that owing to the bilingual advantage, bilinguals are more efficient in retrieving stored information from memory than monolinguals. The perception of L1 as successful in aiding L2 vocabulary acquisition among the participants can be attributed to the interaction between the two verbal systems in bilinguals (Paivio & Desrochers, 1980).

Paivio (2014) observes an additive memory effect of translation equivalents in bilinguals as he found the two language codes to be, “independent and additive in their joint effect on recall” (p. 51). For instance, Ksana, one of the intervention participants, who was studying German as a subsequent language during the time of the research study, stated that she used both English and Russian languages when studying German as

she felt they facilitated her acquisition of the German language. This is in line with the translanguaging principle where, “accessing different linguistic features or various modes of what are described as autonomous languages” makes it possible, “to maximize communicative potential” (Garcia, 2009, p. 140). It is also congruent with Cook’s (2001) notion of a unified language system in the bilingual and Paivio and Desrochers’s (1980) views on the interconnection between the two verbal systems of the bilingual.

Based on the above, it can be assumed that due to a high level of connectivity between the two verbal systems, the use of L1 in L2 learning may occur both intentionally and unintentionally. This is reflective of the notion that an individual’s L1 is a natural part of his/her L2 thinking, and that it plays a vital role especially in L2 vocabulary acquisition. This might be due to the fact that “the L2 meanings do not exist separately from the L1 meanings in the learners’ mind, regardless of whether they are part of the same vocabulary store or parts of different stores mediated by a single conceptual system” (Cook, 2001, p. 407).

Overall, for the participants in this study, as noted by Paivio and Desrochers’s (1980) BDCT, the use of L1 and imagery demonstrated interconnectedness at both referential level (between verbal systems, between verbal system/s and the image system) and associative levels (L1 synonyms for L2 target words). Thus, in relation to vocabulary learning, activation of several systemic connections at various levels may enrich the vocabulary learning experience of an ESL learner due to their additive effects on each other.

Findings reveal that among this study’s participants, there were ones who deliberately attempted to keep the two languages separate not because they saw little

relevance of L1 in L2 learning, but exclusively because they have been discouraged to rely on interlingual VLSs by previous ESL teachers. This practice is mostly initiated and maintained by Eurocentric, traditional teaching methods, which most of the time, neglect to recognize the already existing linguistic resources of the ESL learner.

It is also questionable how some participants, such as Lina, were able to keep the two languages separate given that high levels of connectivity between L1 and L2 make code switching and translanguaging inevitable in most bi/multilinguals. Even though Lina failed to notice it, there could be instances of code mixing and translanguaging in her speech (Arabic embedded in an English matrix or vice versa). Also, efforts to separate the two languages while perceiving that any connection between them may be detrimental to language learning could have been caused by some participants' lack of knowledge regarding the inevitable interaction between the two verbal systems and the resulting bilingual advantage.

Many research studies underscore the significance of socio-linguistic resources in language learning (Arabski & Wojtaszek, 2011; Norton, 2013; Skilton-Sylvester, 2002). These studies identify language learning as a social-psychological process, in which the role played by the wider social context should be taken into consideration (Arabski & Wojtaszek, 2011). Hence, drawing from and making use of the wider social context of the learner in the vocabulary learning process may make learning words more relevant and enriched.

Contrary to the additive effects of translation, findings also indicate two instances where L1 use was problematic. Firstly, for some English words, there exist no one-word translation equivalents in some of the participants' L1s (e.g., Arabic, Mandarin). For

example, as indicated by a few of the intervention participants, there were certain L2 words that had no L1 translation equivalents. For example, instead of a single word translation equivalent for the word “infrastructure,” the Chinese language has a multiword phrase conveying the same meaning. In such situations, using translation equivalents to understand the precise meaning of a word may be problematic. Secondly, sometimes, in certain other languages (e.g., Russian), there are too many synonyms and therefore, it is a challenge to select the most appropriate translation equivalent. This can be attributed to the fact that translation equivalents are expedient when the word pairs are concrete nouns or cognates rather than abstract words such as the general academic words in the current study (García et al., 2014). Interestingly, as in many cases, most participants believed that imagery played a more prominent role in aiding meaning retrieval than L1 translation equivalents. This is discussed in more detail in the next section.

The Use of Imagery in Vocabulary Learning

Recall that the questionnaire respondents did not believe that imagery is an effective VLS. One reason for this belief may be attributed to the lack of awareness in imagery-based mnemonics and their role in the mediation of cognitive activities in the individual’s mind. On the contrary, intervention participants believed imagery to be an effective and useful VLS that helped them acquire L2 novel words. In fact, some intervention participants found imagery and use of their L1 to be more useful than translation equivalents in recalling word meanings. This is explained through the Dual Coding Theory’s (Paivio & Desrochers, 1980) description of the impact of both the verbal system and the image system on vocabulary acquisition.

The intervention participants' positive disposition towards imagery-based strategies may have been born out from the fact that they had the opportunity to experiment with both L1 and imagery during the intervention and to experience the facilitative role it played during Immediate and Delayed Recall Tests. This favourable disposition echoes the findings of other researchers (e.g., Farley et al., 2012; Paivio, 2014; Sadoski, 2005; Shen, 2004) who propose the facilitative effect of visual referents in the retrieval of information pertaining to vocabulary.

Several intervention participants were of the belief that the images were more useful than L1 translation equivalents in recalling word meanings. Despite their beliefs, it is not an easy task to unravel exactly what contributed to their retrieval of the word meanings. The study's intervention explored how the combination of the two systems was effective in recalling word meanings, as this is the foundation of the BDCT. As proposed by the BDCT (Paivio & Desrochers, 1980), it is likely that the images and the translation equivalents together provided the intervention participants with the necessary information to recall target words owing to the connections that are made between and among the three systems at referential and associative levels.

As described in the findings, the images created by the intervention participants in the current study were not exact representations of the words, but, hooks or clues to retrieve their meaning on a later date. As the novel words in the current study were abstract in nature, the participants were required to explain the connection between the words they selected and the images they created in an anecdotal form. This entailed deep cognitive involvement by the participants as their task transcended beyond creating visuals. It involved discussion to establish easily recallable and meaningful connections

between an abstract word and an image, which can be a challenging task. Several participants mentioned that they recalled the conversations they had had during intervention sessions when they had to retrieve word meanings for the immediate and delayed recall tests. This is in line with the basic premise of Craik and Lockhart's (1972) the Levels of Processing Theory, which proposes that information processed at a deeper level leads to stronger memories.

Findings also revealed that, by decoding the visual, the intervention participants were not only able to understand the meaning of the word, but also how it could be used in a sentence. According to some of them, images have the ability to provide crucial contextual information required to perform the above tasks. For instance, the Chinese students created a visual for the word, "reluctant" where a young woman is married off to some man by force despite her being in love with another man. The participants drew a crying bride in a sedan carrier thinking of another man to indicate her reluctance to be married to the wrong man. This type of highly descriptive, yet simple images can provide rich contextual information for word meaning retrieval. This type of strategy falls under the category of encoding mnemonics as they help transform low imagery, abstract words into forms that are more memorable (Bellezza, 1987; Kristiawan, 2012). Moreover, the entire process of converting abstract words into images entails elaboration of information, which in turn, ensures that the information is processed at a deeper level enabling strong memories (Craik & Lockhart, 1972).

Culturally relevant imagery. As stated above, imagery-based strategies may have a positive influence on vocabulary acquisition due to their additive effect. In the current study, a significant number of questionnaire respondents believed that they would

benefit if the imagery used in ESL teaching reflected their own culture. This confirms the view that, “one’s natural tendency is to assess a novel stimulus with respect to one’s own cultural system” (Alptekin, 1993, p. 137). Specifically, ESL content that is of little cultural relevance can negatively influence both the learner and the learning process (Canagarajah, 1993; Umera-Okeke, 2016). International students who are alien to the L2 cultural environment may rely on their familiar culture to minimize dissonance caused by the new and unfamiliar content and context. This natural reliance on the familiar culture should be encouraged, as it may create an environment conducive to learning.

In congruence with Alptekin’s (1993), Canagarajah’s (1993), and Umera-Okeke’s (2016) views, all except one of the intervention participants perceived culturally relevant imagery to be more effective than generic imagery. Both Alptekin (1993) and Canagarajah (1993) propose that teaching a new language using the target language’s cultural elements may make target language acquisition more challenging as both the lexical items and the cultural items are alien to the learner. Despite the dearth of literature on this, there are culturally specific differences in the type of images conjured in a bilingual’s mind (Jared et al., 2013; Winograd et al., 1976). For instance, if the L1 and the L2 of the bilingual were learned in two distinctive cultural contexts, the imagery stimulated by translation equivalents will be culture specific. Thus, it should be noted that, due to cultural differences, sometimes learners find it difficult to comprehend and/or accept certain culture specific learning material used in L2 textbooks and by teachers. For instance, both Alptekin (1993) and Canagarajah (1993) observe that when students were presented with concepts which stand in contrast to their cultural norms, they found it a challenge to understand them as an individual’s natural predisposition is to evaluate new

stimuli with respect to his/her own cultural context. For instance, rural Sri Lankan Tamil students in Canagarajah's (1993) study demonstrated their reluctance to accept the images presented in North American textbooks due to their unfamiliarity with western cultural norms. Thus, it is imperative that students who are aligned to the target language's culture are encouraged to first utilize their existing resources in knowledge construction.

It should be noted that all the imagery created in the current study had cultural relevance to the participants. This may explain their overall high scores obtained at the Immediate Recall Test and the Delayed Recall Test 2. This is consistent with Cummins et al.'s (2006) view that the ESL learner's knowledge of his/her culture is a vital resource in L2 learning and that they quite often make use of it when learning a second language (Lado, 1957, as cited in Arabski, 2006). This may be mainly due to its ability to employ the learner's schema and prior knowledge in order to transform unfamiliar material into something more familiar.

As stated in the previous section, creating imagery to recall abstract academic words can be a challenging task. The task became more challenging, as the participants of the current study were required to create culturally relevant images. Both the interview responses and the researcher's observations provide evidence that there was elaboration of information that contributed to deeper cognitive involvement and a high level of engagement during the intervention. This also may have contributed to strengthening the intervention participants' ability to recall the meanings of the target words in the Immediate Recall Test and Delayed Recall Test Two. Thus, the relatively higher test scores obtained can be attributed to stronger memory connections made during the

challenging task of creating culturally relevant images to represent low imagery abstract general academic words.

Culturally generic versus culturally specific vocabulary. A significant finding of the current study is that the culturally relevant imagery created by the participants was of one of two types: culturally generic and culturally specific. Culturally generic imagery consisted of images that were not bound to one culture. On the other hand, culturally specific imagery consisted of images that were unique to a culture.

Culturally specific imagery seemed to have served as strong retrieval cues due to their uniqueness. For instance, the Chinese participants' use of Tian An Men square to symbolize "regime," Arabic participants' use of Omar El Mokhtar (a prominent Libyan political figure) and the Libyan flag to illustrate "attribute," and the Russian participants' image of a bull being used to prepare the land for cultivation as a retrieval cue for "exploit," hold stronger personal associations than an image of trees being cut as a retrieval cue to the word "diminish." As these culturally specific images are extremely familiar and relevant to the students, the connections they establish among the new word, its meaning, and the image are strong and meaningful.

Interestingly, the group who obtained the highest average test score was the one that created the greatest number of culturally specific imagery, while the one that obtained the lowest average test scores was the group with the least number of culturally specific imagery. Some of the culturally specific images the participants created referred to specific places (e.g., Tian An Men Square, Libya, Crimea) and people (e.g., Omar El Mokhtar, Huang Xiao Ming), which are likely to have served as strong retrieval cues. Although this may not be conclusive, it may suggest that when new information is

processed and elaborated using more personalized associations, it leads to better memory traces (Craik & Lockhart, 1972). In the current study, personal relevance was enhanced by the use of images accessed from the intervention participants' respective cultures.

As discussed in the literature review, the creation of mental images is determined by one's world experiences. Studies suggest that culturally biased imagery is best recalled in the culturally congruent language, their L1, rather than in culturally incongruent language, their L2 (Jared et al., 2013; Kroll & McClain, 2013; Paivio, 2014; Zhang et al., 2013). This is a clear indication that the image system functions as a link connecting a bilingual's L1 and L2. This is in line with the assumptions of the BDCT regarding referential connections between the verbal systems and the image system. Hence, it can be assumed that in the current study, culturally relevant imagery served as a link assisting the recall of L2 words that were learned.

Culturally Relevant Knowledge and the Adult Learner

Unlike infants acquiring their L1, adults enter the L2 learning process equipped with a well-developed language system already in place and a wealth of prior experiences. There is an abundance of literature supporting the view that the learner's prior experiences should be validated in L2 learning as learning a second language is hardly a detached cognitive activity free of socio-cultural biases. The findings of the current study may also support this view as it explored to what extent the ESL learners' socio-cognitive resources (i.e., L1 and culturally relevant imagery) impacted their general academic vocabulary acquisition.

In the current study, there were several indications of how the participants perceived their culturally relevant knowledge. For instance, some participants strongly

verbalized that their L1 should not be eliminated because it simplifies the perplexing task of vocabulary learning into a more doable one. Secondly, communicating in one's L1 reduces the anxiety of having to communicate exclusively in a foreign language to a significant level. For example, during the intervention sessions, all participants used only their L1 to communicate with each other. This suggests the extent to which L1 is a vital part of an adult individual's learning process. Despite the fact that the researcher, who did not share their L1, was present, the participants switched to their L1 during the intervention. Speaking in L1 may have been less intimidating and more relatable for the intervention participants in creating culturally relevant imagery and determining translation equivalents.

As discussed above, most participants believed that using culturally relevant images, particularly the culturally specific ones, have been more useful in retaining word meanings due to their high relevance and meaningfulness. However, there was one intervention participant who believed that an ESL learner's tendency to employ culturally relevant knowledge is inversely proportional to his/her degree of assimilation into the L2 cultural environment. This participant had been residing in Canada for a relatively longer period than the other participants and was quite familiar with the Canadian culture. He could easily employ typical Canadian cultural symbols in his vocabulary learning. This participant's distinct perspective does not contradict with the assumptions of the study because images may hold relevance as long as they are derived from a culture that is familiar to the learner.

These findings indicate that an individual who is relatively new to the L2 cultural environment may benefit significantly from VLSs based on culturally relevant prior

knowledge of his/her home culture. The findings may also suggest that the benefits of such VLSs may vary depending on one's familiarity with the L2 culture, and that learners may draw resources from any culture that they are familiar with.

The findings, in general, underscore the impact of the interconnection among verbal systems and the image system in retaining word meanings as purported by the BDCT (Paivio & Desrochers, 1980). It also points out that when new information is elaborated in multiple ways using both verbal cues and visual cues, it may lead to strong memories being made (Craik & Lockhart, 1972; Paivio & Desrochers, 1981). More specifically, these findings indicate the vital role one's familiar culture play in acquiring new knowledge (Vygotsky, 1978).

Efficacy of Culturally Relevant Knowledge in Deep Processing and Retrieval of Vocabulary

Despite slightly varying views on the efficacy of culturally relevant knowledge as a VLS among the participants of the current study, findings indicate significant points regarding its impact on vocabulary acquisition. Overall, the performance on the Immediate Recall Test was better than that of the Delayed Recall Tests. Also, the fact that the performance on the Delayed Recall Test 1 (cloze test) was less favourable than the Immediate Recall Test (multiple choice) and the Delayed Recall Test 2 (multiple choice) is noteworthy and warrants further investigation.

Participants' perceptions regarding the use of their L1 and culturally relevant imagery polarized between useful and not useful. For instance, Mei, Ahmed and Ksana did not perceive this VLS to be effective. Interestingly, despite the belief, both Mei Ahmed performed well in all three tests, while Ksana performed well in Immediate Recall Test. For instance, although Mei was skeptical about the use of culturally relevant

knowledge as an effective VLS, she attained high scores for all three tests. Similarly, Ahmed, who too perceived this to be not so effective, as he did not consider himself a visual learner, scored 100% for all tests. Clearly, test scores did not reflect the perceptions of those who held an unfavourable disposition towards this VLS except in the case of Ksana, who scored comparatively low marks for both her Delayed Recall Tests. Ksana also did not consider herself a visual learner, yet performed well on the Immediate Recall Test. The participants' perceptions and evaluations regarding their learning style preference may not be completely accurate as their conclusions might have been based on intuition rather than formal assessment (the construct of learning style/preference was not explicitly explored in this current study).

Their overall success might be attributed to the architecture of the individual's brain, where the cognitive activity is mediated by his/her verbal system and the image system (Paivio & Desrochers, 1980). It might also be attributed to the bilingual's two language systems, which show a certain degree of activation and some interaction between them at all times, even in situations that call only for one of the languages (Bialystock, Craik, & Luk, 2012). These views underscore the fact that despite what the participants believe, the influence of the three systems on their cognitive activities is inevitable.

The fact that all participants performed well in the Immediate Recall Test may underscore the significance of a VLS that utilizes their socio-cognitive resources in aiding the recall of meanings of newly acquired words. Additionally, the fact that the performance on the Delayed Recall Test Two was also successful is indicative of the fact that this strategy is useful in increasing ESL learners' receptive vocabulary (i.e., listening and reading). In other words, the average mark was higher when the English word, the

corresponding image, and the translation equivalent were all present. Thus, the participants were required only to recall the meaning with the aid of the image and the translation equivalent. Conversely, performance was comparatively poor on the Delayed Recall Test 1 when the intervention participants were expected to recall the target L2 words and connect them to the given image and the L1 translation equivalent. This necessitated the availability of an acoustic or a visual link between the word and the translation's equivalent as in the key-word method (Paivio & Desrochers, 1981) in order to facilitate easy retrieval of both the English word and the meaning. However, in the context of the current study, for some participants, this strategy may have been useful in recalling both the word and the meaning, as they obtained high scores for the Delayed Recall Test 1.

The current study's intervention entailed six face-to-face encounters over a period of 6-10 weeks. During this period the researcher observed that the participants became more adept at creating culturally relevant imagery. The majority of them learned and acknowledged that using their L1 in L2 learning is not something that they should avoid as their culturally relevant knowledge could play a facilitative role in the vocabulary learning process. The intervention participants were also vocal about the assistive role their L1 played in L2 vocabulary learning during the intervention. Despite the brevity of the intervention, the participants did begin to shift their beliefs towards the utility of L1 and imagery use.

In sum, it can be concluded that the VLS employed in this intervention can be considered useful in enhancing abstract, academic vocabulary by interlinking the verbal systems, image system and the cultural resources of the ESL learner graduate student. This VLS recognizes, acknowledges, and utilizes the socio-cognitive resources of the ESL student.

Impressions of Collaboration in Vocabulary Learning

The majority of the questionnaire respondents (Phase 1) demonstrated a preference for working alone when learning vocabulary. In congruence with this, most of the intervention participants (Phase 2) also expressed that working alone would be more beneficial specifically in terms of creating images to learn vocabulary. However, they did observe several benefits of collaboration despite their strong beliefs that imagery should be created on one's own to be personally meaningful.

Social constructivists (Vygotsky, 1978) emphasize the significance of interaction in the knowledge production process, yet the participants in the current study demonstrated a preference to work alone. In the current study, the participants were instructed to collaborate with each other when determining translation equivalents and creating imagery. There were no formal instructions provided regarding collaboration beyond that. The reluctance to collaborate might be attributed to any of several reasons. Firstly, individuals may prefer to work alone due to lack of awareness regarding the pivotal role played by interaction in learning. In the case of the present study, there was adequate evidence to conclude that the participants had only limited knowledge regarding the plethora of VLS available and how to enhance their learning of these VLS through interacting with others. Secondly, due to certain cultural practices, for instance, if collaborative learning is not practiced or encouraged in the home country, the participant(s) may not have this prior experience and recognition of the potential benefit to their learning. Although there was no explicit evidence in the current study to definitively draw this conclusion regarding cultural practices, during the intervention, there was one instance when a female participant requested to be not paired up with male participants as it violated her cultural norms. This underscores the fact that educators

need to have cultural sensitivity in the Canadian multicultural classroom as the absence of such sensitivity may have a negative impact on learning. Thirdly, one's personality type also may determine one's inclination to work alone or in groups. For instance, in the interview, one participant asserted that she prefers to work alone as she generally does not like people. Thus, despite what is postulated in the social constructivist theory, adult learners may not opt for collaboration if it requires them to traverse beyond their comfort zone. However, if the hesitation is due to lack of awareness regarding the benefits of collaboration, it could be suggested that educators raise learners' knowledge of the potential effectiveness of collaborative learning.

Despite the overall ambivalence, there was also some degree of positive feedback on collaboration among the intervention participants (Phase 2), which confirms its efficacy as proposed by proponents of social constructivism. For instance, the participants valued the assistive role discussion played in aiding the retention of new words and their meanings. The lengthy discussions they had with each other when determining translation equivalents, negotiating between different imagery options, how an image could be reflective of the target word helped with the deep processing of the target words leading to stronger memory connections. Thus, even though the learners lacked explicit knowledge regarding the benefits of collaboration, once provided with opportunities to collaboratively engage, they acknowledged its benefits to the learning process. The positive impacts of collaboration mentioned by the participants are discussed in the next section.

Impact of Collaborative Discussion on Vocabulary Learning

In the current study, collaboration provided the participants with an opportunity to deeply engage in the to-be learned material (Jonassen, 1999; Taber, 2006) rely on more capable peers for assistance (Vygotsky, 1978) and participate in communities of practice (Lave & Wenger, 1991). During their interviews, the intervention participants described the facilitative role of the scaffolding (Vygotsky, 1978) provided by their more knowledgeable other (i.e., their L1 peer) in creating visuals, determining meanings of words, and other information pertaining to a word.

It was important during the current study's intervention that participants were highly engaged with the to-be-learned material because establishing connections between an abstract word and an image reflecting its meaning through discussions entailed, agreeing, disagreeing, and negotiating (Lave & Wenger, 1991). The high-level engagement resulting in a deep processing of the to-be-learned material (Jonassen, 1999; Taber, 2006) was expressed in the participants' post-intervention interviews when they expressed their impressions on the efficacy of discussion during collaboration. In particular, they expressed that the time they spent in discussions about culturally relevant imagery and the content of these discussions played a fundamental role in aiding the retrieval of word meanings. This is consistent with the social constructivist notion of building knowledge, which posits learning as a social process where meaningful learning occurs as a result of social interaction (Vygotsky, 1978) and communities of practice (Lave & Wenger, 1991), which recognizes the role played by sharing ideas, beliefs, and determining solutions for shared problems.

The findings also indicate that the process of collaboration enabled access to L1

peers for support, which is in congruence with the concept of the Zone of Proximal Development (ZPD) proposed by Vygotsky (1978). This was expressed in the participants' interview responses where they described how some of the L1 peers assisted others when there were barriers in determining word meanings, learning information such as its part of speech, and creating imagery. This is consistent with Aljaafreh and Lantolf's (1994) view that learning within the ZPD integrates the teacher, the learner, their respective social and cultural histories, their goals and motives, and resources available to them including the resources they have constructed together through dialogue.

Implications for Theory

Four theoretical frameworks were foundational for the current study: Paivio and Desrochers's (1980) Bilingual Dual Coding Theory (BDCT); Craik and Lockhart's Levels of Processing Theory (1972); Gu and Johnson's (1996) taxonomy of VLS; and Vygotsky's (1978) Social Constructivist Theory. Using these theories as the basis, the study sought to find out how a vocabulary learning strategy that utilizes the socio-cognitive resources of the ESL learner may help deep processing of high frequency general academic vocabulary acquired in a collaborative setting.

Implications for Theory: Using VLSs That Utilize Socio-Cognitive Resources

The results of the study indicate that ESL learner graduate students can benefit from a VLS that utilizes their socio-cognitive resources in developing their vocabulary. As purported by the Bilingual Dual Coding Theory (Paivio & Desrochers, 1980), a bilingual's cognitive activity is mediated by three independent but partly interconnected symbolic systems. These symbolic systems comprise the bilingual's two verbal systems that correspond to his/her language systems and the image system. Although these three

systems possess the ability to function both independently and interdependently in terms of acquiring new knowledge, interaction among the three systems may yield better learning outcomes due to their ability to complement and supplement each other. Thus, it might be assumed that VLSs that integrate the three systems, such as the VLS in the current study, would offer more assistance than other VLSs that make use of only one or two of the systems.

It should be noted that although the image system may contribute to better vocabulary retention, not all images work equally well for all learners due to cultural incongruences. Simply, images that are of cultural relevance to learners make a more significant contribution to their learning than culturally irrelevant ones. Interestingly, in the current study, among the culturally relevant images, the ones that were specific to one culture seemed to play a more facilitative role than the ones that were more generic (Alptekin, 1993; Canagarajah, 1993). Thus, as an explanation of the findings of the current study, it can be assumed that VLSs that consider and draw from the cultural resources of learners contribute to vocabulary development due to their ability to transform unfamiliar content to something less alien and more personal. However, depending on the degree of assimilation to the L2 cultural environment, a learner may or may not rely completely on knowledge relevant to the home country's culture. In terms of imagery, learners could draw on either the home or host country's culture. This is acceptable as long as the images are meaningful and relevant to them.

Given the findings of this study, it can also be conjectured that the learner's L1 might also facilitate vocabulary acquisition due to its additive effect and the interdependence between the verbal systems. It is not possible for an ESL learner to

completely block the influence of his/her L1, as a bilingual is not two monolinguals in one person (Grosjean, 1989). Due to the inherent interconnectivity of the three systems, a bilingual may access all the three systems simultaneously, thus stimulating connections between systems at both the representational and referential levels (refer to Figure 2). García (2000) contends that a bilingual's translation "should not be viewed as compensatory strategies, but as resources that reflected their bilingual identity" (p. 824). Hence, reliance on L1 should not be evaded but encouraged during vocabulary learning, as evasion may not be possible due to the architecture of the bilingual's brain.

As both culturally relevant imagery and L1 have a positive impact on vocabulary learning, it can be proposed that a VLS that utilizes both would yield better outcomes as it incorporates the two verbal systems and the image system of the ESL learner. In other words, such a VLS allows ESL learners to access L2 target vocabulary words via L1 translation equivalents represented by culturally relevant imagery. This is in congruence with the proposition that the image system offers an indirect access route from one language to the other where vocabulary is concerned (Paivio, 1990; Soh, 2010).

There are several explanations for the effectiveness of VLSs that base themselves upon BDCT and culturally relevant knowledge. Firstly, from a cognitive perspective, VLSs that utilize culturally relevant knowledge recognize and make use of the schemata of the learner. This confirms the constructivist idea that learning is the process of building new knowledge on the foundation of what one already knows. Secondly, VLSs based on BDCT and culturally relevant knowledge honor the cognitive architecture of the individual. As purported by Paivio and Desrochers (1981), Thornburry (2002), and Jones (2004), mnemonics which employ mental imagery facilitate vocabulary acquisition as

they connect both the verbal system and the image system together. In other words, vocabulary items which are processed using multiple methods are better retained as there is deep engagement when they are processed (Craik & Lockhart, 1972; Jones, 2004; Laufer & Shmueli, 1997; Prince, 1996; Ramachandran & Rahim, 2004). Thirdly, from a cultural perspective, culturally relevant knowledge transforms the unfamiliar or the less familiar into something familiar and thereby makes learning more relevant and personal. This confirms the constructivist notion that culture and interaction play a vital role in learning. If there is a mismatch between the to-be-learned material and the culture of the learner, it could have detrimental effects on the learning process (Alptekin, 1997; Canagarajah, 1993). Thus, letting the learner use culturally relevant knowledge may eliminate any discrepancies that occur between the learner and the material to be learned. It may also eliminate or reduce the cognitive dissonance caused by unfamiliar information.

Thus, it can be concluded that ESL learners are likely to benefit from a VLS supported by the BDCT (Paivio & Desrocher, 1980) and the social constructivist theory (Vygotsky, 1978) as they enable the learner to draw from his/her existing socio-cognitive resources, thereby making the learning process more relevant and less complicated. It should be noted that although the current study confirms the BDCT theory, it suggests an extension of the BDCT incorporating culturally specific and culturally generic images into its image system (refer to the proposed Figure 13). The image system of an individual from another culture may contain images which are specific to that culture. When that individual makes the decision to live in his/her L2 culture, his/her image system may contain three types of images: images specific to L1 culture, images

specific to L2 culture and imagens which are not bound to either culture. This reality should be acknowledged where the BDCT is concerned and hence it needs to be extended.

Implications for Theory: Enhancing Deep Learning of Vocabulary through Elaboration

The Levels of Processing Theory proposed by Craik and Lockhart (1972) is central to discuss the findings of the current study as it asserts that deep processing of information results in better memory. Craik and Lockhart (1972) claim that “greater depth” implies a greater degree of semantic or cognitive analysis [and once a stimulus is recognized] it may undergo further processing by enrichment or elaboration. For example, “after a word is recognized, it may trigger associations, images or stories on the basis of the subject's past experience with the word” (Craik & Lockhart, 1972, p. 675). In light of this, it can be assumed that the VLS that was employed in the current study is one such strategy since it requires the learner to connect a new word to his/her prior knowledge. Craik and Lockhart (1972) recognize the extent of attention given to a stimulus, time available for processing it and its compatibility with the analyzing structures as determinants of the depth to which the stimulus is processed. Employing culturally relevant knowledge as a VLS practiced in a collaborative learning setting, fulfills all these criteria.

In order for deep learning to occur, it is imperative that the information received is elaborated. Elaboration entails increasing the distinctiveness of the information encoded (Hulstijn & Laufer, 2001; O’Malley & Chamot, 1990). Elaboration leads to the

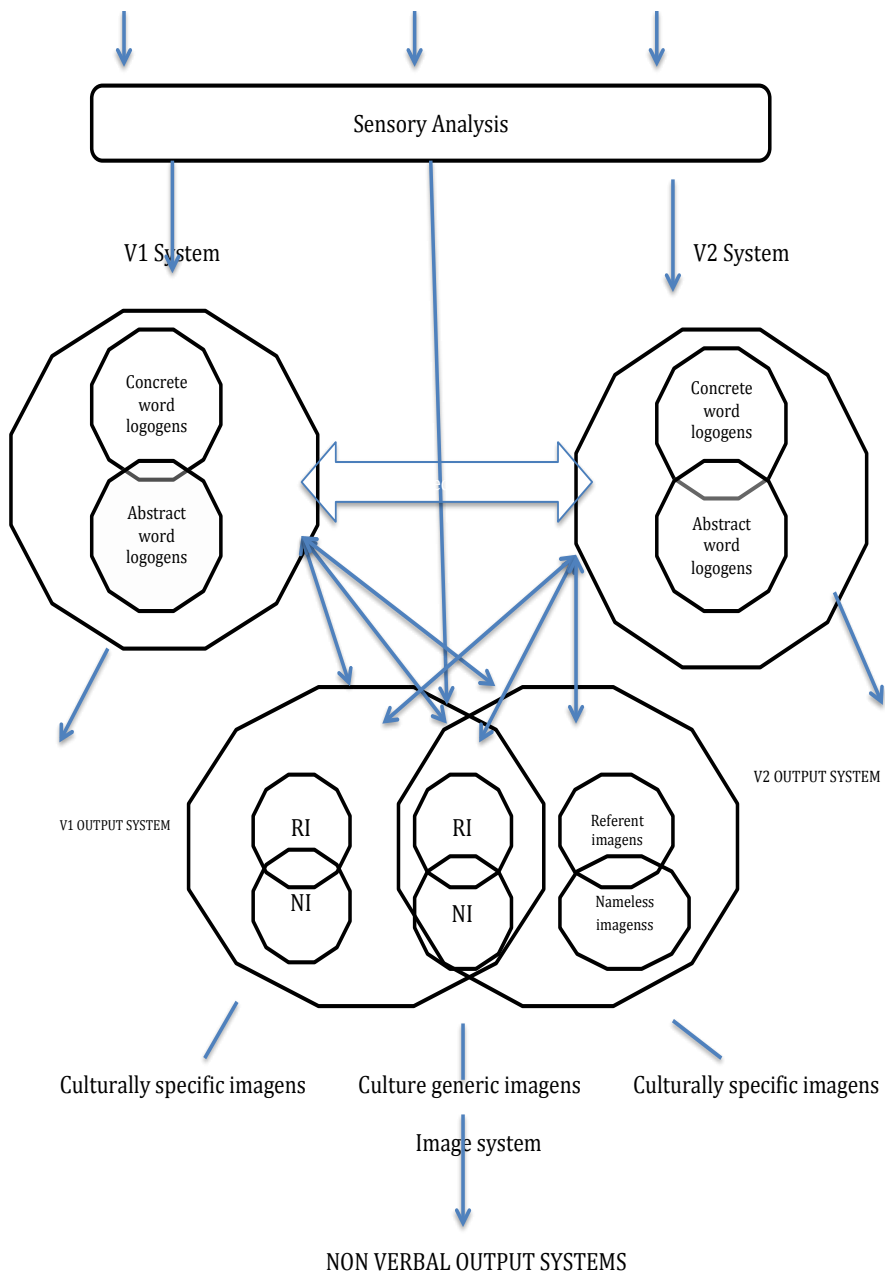


Figure 13 Bicultural-Bilingual Dual Coding Theory

individual storing more information about a stimulus, which, in turn, facilitates differentiation between memories (Santrock, Woloshyn, Gallagher, Di Petta, & Marini, 2010). This can be achieved in many different ways such as constructing images to represent new information (Oxford & Crookall, 1990; Thornbury, 2002) or using translation equivalents in L1 (Hummel, 2010). When information is presented using both pictorial and verbal cues, it is remembered better due to their ability to elaborate on new information (Farley et al., 2012; Jones, 2004; Oxford & Crookall, 1990; Paivio, 1971, 2014; Shen, 2010). Also, when the images are meaningful to the learner, it leads to better retention as the cognitive burden on the learner to remember unfamiliar information is lessened. Thus, based on the results of the current study, it can be assumed that culturally relevant imagery aided by L1 translation equivalents, facilitated the retention of the meanings of newly encountered target words by enhancing the distinctiveness of the information encoded. Hence, a VLS similar to the one that was employed in the current study has the potential to facilitate vocabulary acquisition as it leads to deep processing of information through elaboration.

The VLS employed in this study falls into the category of mnemonic strategies, as they required reflective cognitive involvement (Paivio, 1983; Roediger, 1980; Takač, 2008). In the current study, as the words to be learned were abstract in nature, the intervention participants were required to remember the associations between the word and information in the form of an anecdote. These anecdotes helped the participants elaborate the information to be remembered and provided them contexts in which those words can be expressed in speaking and writing. This corresponds to Paivio and Desrochers's (1981) assertion that mnemonics based on imagery make language learning exciting as they enhance the meaningfulness of the task even when there is no real-life

situation that calls for the use of that language. Elaborating on this, they propose the need for a, “naturalistic context for language use that generates referent situations mentally in response to words during study trials, and then retrieves the words partly through the medium of those imaginal contexts during recall” (Paivio & Desrochers, 1981, p. 790). This is commensurate with the findings of the current study, in which the participants found that the process of creating imagery through elaboration, in addition to the images themselves, provided them with a whole context to decode the meaning of new words.

In conclusion, it is evident that elaborating information to be learned using culturally relevant knowledge leads to deep processing. This is in congruence with the Levels of Processing Theory’s premise that deep processing results in better memory (Craik & Lockhart, 1972). The learner can associate a new stimulus with experiences that are of high personal/cultural relevance, thereby enhancing the distinctiveness of that memory. In the context of the current study, the new stimuli were linked to the participant’s L1 and to culturally relevant (specific/generic) imagery, which, due to their high degree of relevance and meaningfulness (Hummel, 2010), led to stronger memory traces, resulting in deeper processing of information. This may be practiced either in collaborative or individual learning settings depending on the preference of the learner.

Implications for Theory: Enhancing Vocabulary Learning Through Collaboration

Creating a visual image to represent the meaning of an abstract academic word is challenging and requires a high level of engagement with the word. In the current study, it is likely that since the VLS was practised in a collaborative learning setting, there was an enhanced level of engagement with the task and the attention given to the stimulus. For instance, when the intervention participants were determining both translation equivalents and imagery, there was a lot of agreeing, disagreeing, and negotiating. The

social constructivist view states that social phenomena are created through interaction (Gredler, 1997; Pritchard & Woollard, 2010) and that dialogue in collaborative tasks are vital to second language acquisition (Anton & DiCamilla, 1999).

When collaborating, learners are able to obtain assistance from their peers in overcoming temporary barriers to learning. The results of the current study demonstrate that such assistance was constantly provided by more knowledgeable others in the dyad/group during the intervention. Collaboration has the ability to enhance learning through interaction. Thus, the current study is aligned with the principles of the social constructivist theory, which discusses the importance of interaction in learning.

Although in the current study the issues of feasibility and time constraints were raised and viewed as obstacles to collaboration, the outcomes of collaborating seem to outweigh the challenges. It might be considered that once learners have initially collaborated in their use of a VLS, that the VLS might be applied in independent learning settings outside of the classroom thereby requiring less coordination and time.

Implications for Practice

In general, the findings of the current study shed some light on a research area where there is scarcely any literature. Even though the use of L1 in vocabulary learning has been researched in various linguistic environments, the use of culturally relevant imagery in vocabulary learning is an under-researched area. The few studies that have been conducted are in the field of psychology (e.g., Kroll & McClain, 2013) and have limited application to ESL teaching/learning. Thus, based on the findings of the current study, some assertions can be made regarding the use of culturally relevant knowledge in vocabulary learning strategies.

Introducing VLSs That Honour the Socio-Cognitive Resources of ESL Learners

Postsecondary education requires students to hone all four language skills: listening, reading, writing, and speaking. In order to communicate their ideas and comprehend what others say, learners need superior receptive (i.e., reading and listening) and productive (i.e., writing and speaking) vocabularies. On the contrary, findings of the current study indicate only a small portion of these learners consider their vocabularies to be excellent. As vocabulary learning is a never-ending pursuit and ESL students in graduate programs rarely have additional time to pursue language courses, it is imperative that they are equipped with VLSs that might enable autonomous vocabulary development. One of the observations made during the current study was that participants lack VLS knowledge, and hence, consider vocabulary learning a challenge.

The existing strategies that ESL students possess are predominantly discovery strategies (Gu & Johnson, 1996; Schmitt, 1997, 2000) that enable them to find out meanings of unfamiliar words they encounter in their daily academic readings. The few consolidation strategies (Gu & Johnson, 1996; Schmitt, 1997, 2000) that are currently popular are non-mnemonic strategies that entail little cognitive involvement; these latter strategies are prevalent among less successful language learners (Nemati, 2008; Rahimy & Shams, 2012; Tsai & Chang, 2009). Although the participants indicated that they used guessing strategies and contextual encoding as VLSs, research suggests that, in order to guess the meaning of a word in context, the reader must at least understand 95% of the other vocabulary in the text (Chall & Jacobs, 2003; Laufer, 1989, 2010; Liu & Nation, 1985; Nadarajan, 2007; Nation, 2013; Nation & Waring, 2004; Schmitt, Jiang, & Grabe, 2011). At graduate level, it is expected that the students are equipped with sound

vocabulary knowledge as it is pivotal to critical thinking (Fastrup & Samuels, 2008). For the participants in the current study, their initial level of VLS knowledge or use did not contribute to long-term vocabulary retention that would help them in their critical thinking; they required VLS to support their vocabulary retention.

Thus, it is of vital importance that ESL students are made aware of the taxonomies of VLS that are available to them for autonomous vocabulary development. Specifically, general academic vocabulary is rarely taught in language instruction courses or in discipline-specific courses despite its inevitable presence across all disciplines. As teaching and learning vocabulary at graduate level is a difficult and a challenging task, it is important to expose the ESL learner to the wide variety of VLSs available. This may help them become autonomous vocabulary learners, which, in turn would contribute to their overall academic development. Furthermore, the ability to select the most effective strategy would not only help them recall meanings but also the use of those words in real life contexts to become more successful learners.

Although there are many VLSs available, this study suggests the value in teaching ESL students how to use their L1 and CRI as socio-cognitive resources. In other words, VLSs that interconnect the languages available in the learner's language repertoire and the image system would be beneficial as such VLSs are enhanced and supported by the cognitive architecture of the bilingual. In addition, in the case of ESL students who are new to the language of instruction, it is important to educate them on VLS strategies that utilize their prior knowledge and experiences specifically during the initial stages of language learning. For instance, in terms of the verbal systems, some of them may have issues with the language of instruction and hence rely on their L1 to fill gaps in their knowledge. Where the image system is concerned, as these students are alien to the L2

culture, they may not fully comprehend certain images and concepts present in their social and classroom environments. This should not be viewed negatively, and instead, should be encouraged as it engages learners to make use of their existing resources to construct new knowledge.

In the case of the current study, the two languages in question were learned in the same cultural context (i.e., participants' native country). Thus, it may be assumed that the imagery evoked by L2 words and their L1 translation equivalents would be the same for some of the words that were acquired prior to coming to Canada for most new ESL students. Hence, under such circumstances, it would be judicious to advise ESL students to use imagery that would make the most sense to them as retrieval cues.

Educating the ESL learner on VLSs that build on the socio-cognitive resources they possess such as using their L1 resources and culturally relevant imagery, may help in better retention as such strategies have more personal associations. Specifically, imagery provides not only retrieval cues but also contexts that might help learners establish more meaningful definitions of a word. The numerous connections made at representational, referential, and associative levels among the two verbal systems and the image system provide the ESL learner with more wholesome and enriching vocabulary learning experiences.

Among the current study's participants, even though there was a positive disposition towards the facilitative effects of imagery, questions were raised with regard to the amount of time spent on creating images and the level of creativity required. In the current study, the participants were required to sketch images for target words, as this was a part of the intervention procedure; this is time consuming. Subsequently, if imagery is used as a strategy, learners do not need to sketch, and instead, may create a

mental image or discuss a potential image with a colleague. Alternatively, ESL learners might employ digital technologies that assist them to create, download, alter and enhance images. These customized images might be collaboratively shared with other ESL learners in virtual environments and through social media channels.

In terms of collaboration, even though social constructivist theories (e.g., Vygotsky, 1978) underscore the importance of interaction in learning, in the current study, initially most participants showed a preference to work alone in their vocabulary learning and also in learning in general. This calls for a reconsideration of the feasibility of collaboration especially in terms of developing sub-skills such as the vocabulary skills needed in their major areas of study. However, it should be noted that the reluctance for collaboration may not apply to collaborative activities within the ESL students' major discipline courses.

In light of the findings, the researcher assumes the position that despite minor barriers, ESL students may benefit from a VLS based on their culturally relevant knowledge, which entails their L1 and CRI. This conforms to Alptekin's (1993) view on the need for a smooth transition from familiar to unfamiliar schemata. Under these circumstances, the elimination of the L1 and imposition of Eurocentric imagery where L2 learning is concerned needs to be reconsidered as this ignores the linguistic and cultural resources possessed by the ESL learner. Also, not acknowledging the prior knowledge of learners is inconsistent with constructivist principles of learning; the use of strategies that utilize the ESL learner's socio-cognitive resources makes vocabulary learning more meaningful and substantive.

Contributions of the Study

Despite the modest sample, this research study makes several contributions to the field of second language education and second language research. First and foremost, it can assist in university policy development where international students who speak English as their second language are concerned. Secondly, the study proposes a potential vocabulary learning strategy that honours the ESL learner's socio-cognitive resources. Outcomes of the study inform students and educators alike on how a VLS honouring ESL learners' socio- cognitive resources can be utilized in enhancing general academic vocabulary acquisition. Finally, the study addresses a gap in research on the influence of socio-cognitive resources on vocabulary learning in ESL learners. This gap is now informed by a conceptual model shown in Figure 13, Bicultural-Bilingual Dual Coding Theory.

Methodological Limitations and Implications for Future Research

For the current study, some methodological limitations are worth discussing. Firstly, the size of the questionnaire sample represented 7% of the total number of international graduate students registered for the 2016/2017 academic year (Brock University, 2017b). The questionnaire was distributed via the University International Services email listserv. As the participation was voluntary, the number of responses was less than expected. This is one of the major limitations as it reduced the statistical power (Rogelberg et al., 2003) of the quantitative element in the study. Additionally, the low rate of responses may result in a biased sample where the respondents may be significantly different from the non-respondents. These issues prevented the researcher

from making more significant generalizations on the VLS use of the graduate student population in the university based on the survey results.

Another methodological limitation was the truthfulness of the interview responses (Creswell, 2012). For instance, interviewees may change their responses in order to create a positive impression about them with the researcher. For instance, some participants' views that they do not use their L1 in L2 learning could be due to the widely held, yet unproven assumption among ESL teachers that the L1 and the L2 should be kept separate from each other. Thus, the participants may want to create a favourable impression with the researcher, as they were aware of the position of the researcher as an ESL teacher. The researcher has retained this reality in mind as well as the fact that she has perhaps influenced the participants' responses. Related to the interview procedure, a limitation is also that the interviews were only conducted with the participants post-intervention; thus, the researcher has no documentation of the participants' initial strategy use and how this changed in situ.

Finally, this brings to the fore another limitation in the researcher's positionality as described in both Chapters 1 and 3. The researcher's cultural heritage is from Sri Lanka, where she grew up speaking two languages and acquiring certain norms and values of the West. The researcher was not an active participant in the collaboration among the research participants as they engaged in the intervention, as she was not a part of their cultural background or L1. The researcher encouraged the participants to co-construct language learning among themselves as participants and she then documented their experiences based on their accounts. This limited the researcher's ability to interact with the participants and co-construct meaning with them.

In terms of future research, studies might reconceptualise the nature of the intervention strategies. There might have been more impact if the intervention was not merely limited to creating images and determining translation equivalents. The intervention might include a step where the participants are required to engage in some type of activity using the new words in order to reinforce them. This type of application might have had even more impact on the efficacy of the strategy. Thus, future studies may focus on multi-step interventions that require the participants to use the new words in authentic and applied tasks.

A significant finding of the study was that the culturally relevant imagery created by the participants was of two sub-types: culturally generic and culturally specific. As this was an unexpected outcome of the study, a more detailed comparison of how these two types may individually affect vocabulary acquisition was not carried out. However, future research may focus on a comparative study that assesses the efficiency of these two sub-types of culturally relevant imagery against each other. This is of vital importance in the field of second language teaching/learning. Moreover, how the ESL learner's prior cultural experiences can be utilized in vocabulary learning is under investigated. For instance, most teachers tend to overlook the fact that the ESL learners who relocate to study are taxed as they are expected to engage in academic activities in a foreign tongue and learn the culture of the host country. It is imperative that teachers educate and encourage ESL learners to venture gradually from the familiar to the unfamiliar. As culturally specific imagery in L2 learning can provide them with retrieval cues that are high in personal associations and uniqueness, learners should be encouraged to use them in their language learning process.

Chapter Summary

Chapter six begins with a discussion of the findings of the study. This section started with a brief discussion on general academic vocabulary as a barrier to effective communication. This was followed by a discussion on the issues and concerns regarding the current usage of VLSs, the pivotal role that L1 plays in vocabulary learning, the role of culturally relevant imagery and the distinction between culturally generic and culturally specific imagery. This section was followed by a discussion on the culturally relevant knowledge and the adult language learner, efficacy of culturally relevant knowledge in deep processing of vocabulary and the impact of collaboration on vocabulary learning. Based on the findings, it was concluded that ESL learners show a lack of awareness regarding VLSs available to them, and this affects their academic activities, specifically their academic writing skills. A VLS that utilizes their culturally relevant knowledge plays a facilitative role in their general academic vocabulary uptake as such a strategy aligns with the Bilingual Dual Coding Theory, the Levels of Processing Theory and the Social Constructivist Theory. In other words, while it utilizes the ESL learner's two languages and the image system in processing vocabulary, it also draw from the learner's prior knowledge to construct new knowledge. All these contribute to elaboration of new information leading to deep processing. This section was followed by implications for theory: how the current study confirms theory while proposing its extension. In the last section, implications for practice, contributions of the study, methodological limitations and implications for future research were discussed in detail.

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Appendix A

Vocabulary Learning Strategy Questionnaire

Dear Participant:

The purpose of the questionnaire is to explore the vocabulary learning beliefs and strategies of undergraduates who speak a language other than English as their mother tongue. Please fill out the questionnaire according to your situation. This is *not* a test, there is no right or wrong answer. Do not spend too much time on a question. Usually, your first reaction is the best.

Thanks for your co-operation.

Section 1: Demographic information and previous language learning experience.

1. Name and University e-mail _____

2. Degree Major, Program and Year _____
3. Native language(s) _____
4. What language(s) do you speak at home? _____

5. What was the language of instruction at your school _____
6. How long have you studied English prior to coming to Canada? _____
7. How do you evaluate your proficiency in English vocabulary needed for your academic writing?

1. Excellent _____
2. Fair _____
3. Good _____
4. Poor _____

Which of the options best matches your opinion? Choose one. I find English vocabulary needed for academic writing:

1. very difficult to master _____
2. difficult to master _____
3. medium difficulty to master _____
4. easy to master _____
5. very easy language _____

Section 2: Beliefs about vocabulary learning

Using the above key, please weigh the following statements by putting a check mark under the appropriate number.

1= strongly disagree

2= disagree

3= not sure

4= agree

5. Strongly agree

	1	2	3	4	5
Words should be memorized					
1. Repetition is one of the best ways to learn words					
2. You can acquire a large vocabulary by memorizing lots of individual words					
Words should be acquired in context					
3. It is easier to learn new words when they are presented in context					
4. You can acquire a large foreign language vocabulary simply by reading a lot.					

5. Guessing the meaning of words in context is one of the best ways to learn vocabulary					
6. When you come across a word several times in different contexts, you eventually figure out what it means.					
Words should be studied and put to use.					
7. Vocabulary learning includes learning phrases as well as words.					
8. To know a word, you have to know its form, its meaning, and how it is used					
9. To remember a word, you should always connect it with its meaning in your mother tongue					
10. To remember a word better, you should connect it with an image / a picture of it					
11. To really learn words, you have to do two things: study them and then practice using them					
Motivation					
12. Learning vocabulary is interesting					
13. I like to learn more words than what I encounter in my academic work					
14. I'm motivated to learn vocabulary because it is important for passing tests.					
15. I feel bored or frustrated while learning vocabulary.					
Culturally relevant knowledge					
16. I feel the imagery used to represent certain vocabulary in English language text books are not familiar to me					

17. I feel finding associations between new words and imagery from my country and culture makes it easier to remember their meanings.					
18. I believe my first language is an important resource in developing my English vocabulary					

Section 3: Vocabulary Strategy Use

1 = I never do that

2 = I rarely do that

3 = I sometimes do that

4 = I often do that

5 = I always do that

	1	2	3	4	5
Rehearsal: Using word Lists					
1. I make vocabulary flashcards for new words so that I can memorize them.					
2. I keep lists of new vocabulary words.					
3. I go through my vocabulary list several times until I am sure I know all of the words on the list					
4. I regularly review new words I have memorized					
Rehearsal: Oral repetition					
5. Repeating a new word aloud helps me to remember it					
6. When I am studying new words, I repeat them silently in my mind					
Rehearsal: Written repetition					
7. When I try to remember a word, I write it repeatedly.					
8. I write both the new words and their translations repeatedly in order to remember them.					
Encoding: Associations					
9. To remember a new word, I put it into an English sentence.					
10. I link a new word to an English word that sounds					

similar					
11. I link a new word to its meaning in my first language					
12. I associate words that sound similar.					
13. I associate words that look similar					
Encoding: Imagery					
14. I act out a word to remember it better.					
15. I create a mental image of the new word to help me remember it.					
16. I associate one or more letters in a word with the word meaning to help me remember it (e.g., <i>look</i> has two “eyes” in the middle).					
Encoding: Visual encoding					
17. I visualize the new word to help me remember it.					
18. I learn the spelling of a word by breaking it into several parts					
Encoding: Semantic encoding					
19. I try to remember words in meaningful groups.					
20. I group words into categories (e.g., animals, utensils, vegetables) to remember them.					
Encoding: Contextual encoding					
21. When I want to remember the meaning of a word, I try to recall a sentence in which the word was used.					
22. I remember new words along with the context in which they occur.					
23. I learn words better when I put them in context (sentences).					

Encoding: Word structure					
24. When I learn new words, I analyze them in terms of their prefixes, stems, and suffixes.					
25. I study word-formation rules in order to remember more words.					
Dictionary strategies					
26. I use monolingual dictionaries to find meanings of new words					
27. I use bilingual dictionaries to find meanings of new words					
28. When I see an unfamiliar word again and again, I look it up.					
29. When not knowing a word prevents me from understanding a whole sentence or even a whole paragraph, I look it up.					
Note-taking strategies					
30. I make a note of words that seem important to me.					
31. When I see an expression or phrase that I think I will want to use someday, I write it down for future references					
Guessing strategies					
32. I make use of context to guess the meaning of a word I do not know.					
33. When I guess the meaning of a word, I analyze its parts (prefix, root, and suffix).					
Activation strategies					
34. I try to use newly learned words as much as possible when I write or speak.					

35. I try to use newly learned words in imaginary situations in my mind.					
Using technology to study vocabulary					
36. I like to use online dictionaries to look up new words.					
37. I look up the mother tongue equivalent of new English words in online dictionaries					
38. I use online applications to study new words.					
39. I use mobile devices to study new words					
Affective strategies					
40. I use my mother tongue when learning new vocabulary					
41. If I feel bored or frustrated while learning vocabulary, I take a break or I remind myself that vocabulary is important, and then I go on					
Social Strategies: Communication and cooperation					
42. When I encounter a new word, I would turn to a teacher for its meaning.					
43. I review new words with my colleagues. (one says an English word, the other translates it into Mother tongue)					
44. I share my experience and feelings in vocabulary learning with others					

(Adapted from Gu & Johnson, 1996)

Appendix B

Sample Test Items

Immediate Recall Test and Delayed Recall Test (2)

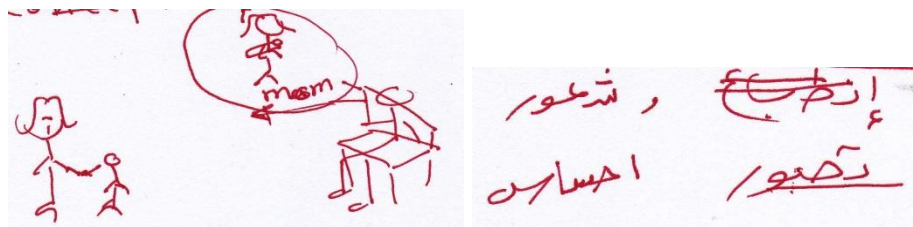
You will find 10 sentences with blanks below. Using the translations given in your First Language and the visual, underline the most suitable word (a,b, or c) to fill the blank.

1. There are wavelengths of light that the human eye cannot.....

a. observe

b. conceive

c. perceive

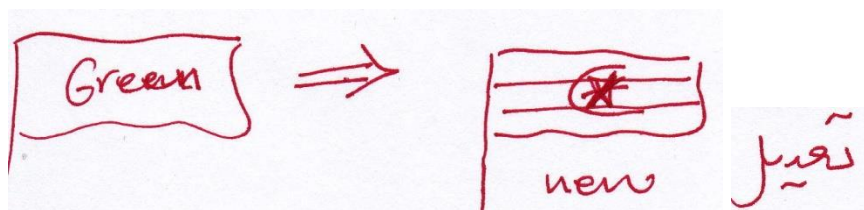


2. We will.....the experiment if the desired results are not achieved.

a. amend

b. constitute

c. negate

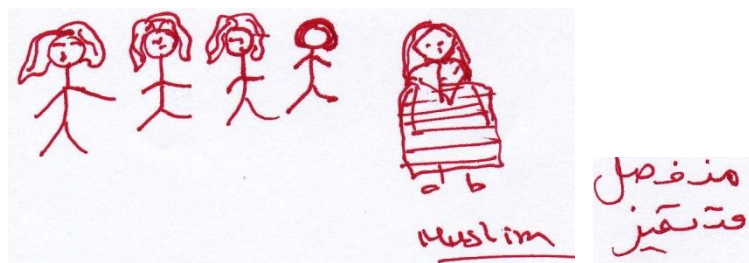


3. At the subatomic level, all objects are made of..... molecules.

a. constitute

b. discrete

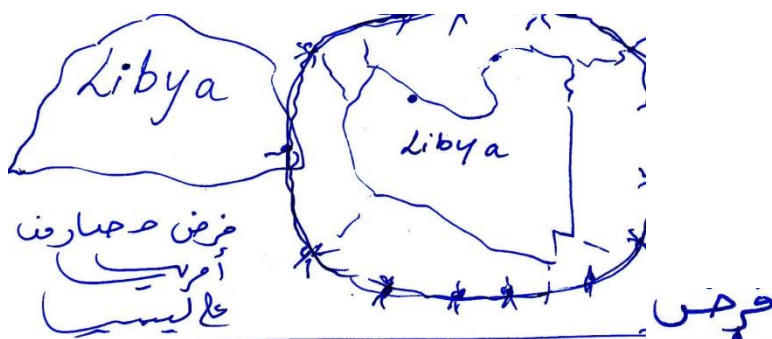
c. concrete



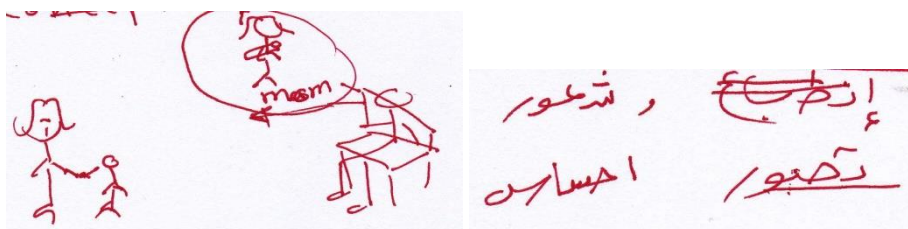
Test 3 - Delayed Recall Test 1 (Cloze Test)

You will find 10 sentences with blanks below. Using the translations given in your First Language and the visuals as cues, write down a word that will best fit the blank.

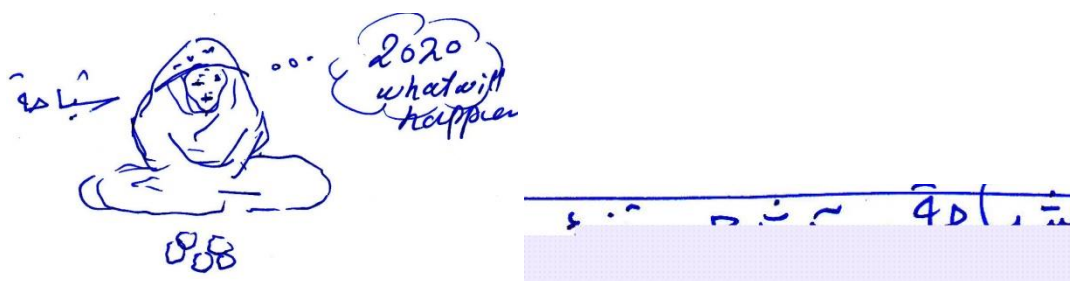
1. The purpose of the anxiety drug is to control over patient's physical and mental responses.



2. You cannot it with the naked eye.



3. Astronomers can the exact time of an eclipse.



Appendix C

Participant Observation Checklist

Student Code: _____

1 = Never

2 = Rarely

3 = Sometimes

4 = Usually

5 = Always

	1	2	3	4	5	Observer Comments
Level of engagement while determining L1 translation equivalents						
Level of engagement while constructing imagery						

Any other comments:

Appendix D

Interview Protocol

1. What are some of the biggest challenges you have when writing assignments?
2. Do you consider English vocabulary as a challenge or does it come easily to you?
3. What are the most common feelings you have during vocabulary learning? What are the occasions when these feelings emerge?
4. How important is it for you to learn English vocabulary? Why do you think this way?
5. Do you consider yourself an effective vocabulary learner or not? Why? Can you give me some examples?
6. People have different ways of learning vocabulary. What are your strategies? Why do you use it/them?
7. Do you use a dictionary? If yes, what type and why that specific type of dictionary?
8. Do you use your first language to learn the meaning of new words? If so, explain in detail.
9. What do you think about using imagery to learn and remember words?
10. Would you like to create your own imagery or do you like the imagery prescribed in text books?
11. Do you think any type of imagery can help you remember the meanings of new words?
12. What do you think of using imagery from your own cultural background to remember English vocabulary?
13. Is it more effective to study vocabulary on your own, or is it better to do it together with others?
14. Tell me about your experience in creating imagery in collaboration with others.
15. Do you see collaboration as an effective method to study new words? Why or why not?

Appendix E

Tabulated Vocabulary Learning Strategy Questionnaire Data

Section 1

Table 1: How do you evaluate your proficiency in vocabulary needed for academic writing?

Level of competence	% of responses
Excellent	4.9%
Good	43.9%
Fair	48.8%
Poor	2.4%

Table 2: I find English vocabulary needed for academic writing:

Participant opinion	% of responses
Very easy to master	0%
Easy to master	9.8%
Medium difficult to master	65.9%
Difficult to master	24.4%
Very difficult to master	0%

Section 2: Beliefs about vocabulary learning

Table 3: Repetition is one of the best ways to learn words

Degree of agreement	% of responses
Strongly agree	34.1%
Agree	48.8%
Not sure	2.4%
Disagree	4.9%
Strongly disagree	9.8%

Table 4: You can acquire a large vocabulary by memorizing lots of individual words

Degree of agreement	% of responses
Strongly agree	14.6%
Agree	29.3%
Not sure	31.7%
Disagree	14.6%
Strongly disagree	9.8%

Table 5: It is easier to learn new words when they are presented in context

Degree of agreement	% of responses
Strongly agree	39%
Agree	51.2%
Not sure	2.4%
Disagree	2.4%
Strongly disagree	4.9%

Table 6: You can acquire a large foreign language vocabulary simply by reading a lot.

Degree of agreement	% of responses
Strongly agree	26.8%
Agree	26.8%
Not sure	36.6%
Disagree	9.8%
Strongly disagree	0%

Table 7: Guessing the meaning of words in context is one of the best ways to learn vocabulary

Degree of agreement	% of responses
Strongly agree	19.5%
Agree	61%
Not sure	14.6%
Disagree	4.9%
Strongly disagree	0%

Table 8: When you come across a word several times in different contexts, you eventually figure out what it means.

Degree of agreement	% of responses
Strongly agree	31.7%
Agree	48.8%
Not sure	14.6%
Disagree	4.9%
Strongly disagree	0%

Table 9: Vocabulary learning includes learning phrases as well as words.

Degree of agreement	% of responses
Strongly agree	53.7%
Agree	41.5%
Not sure	4.9%
Disagree	0%
Strongly disagree	0%

Table 10: To know a word, you have to know its form, its meaning, and how it is used.

Degree of agreement	% of responses
Strongly agree	62.5%
Agree	27.5%
Not sure	7.5%
Disagree	0%
Strongly disagree	2.5%

Table 11: To remember a word, you should always connect it with its meaning in your mother tongue

Degree of agreement	% of responses
Strongly agree	7.3%
Agree	26.8%
Not sure	34.1%
Disagree	24.4%
Strongly disagree	7.3%

Table 12: To remember a word better, you should connect it with an image / a picture of it

Degree of agreement	% of responses
Strongly agree	24.4%
Agree	34.1%
Not sure	29.3%
Disagree	9.8%
Strongly disagree	2.4%

Table 13: To really learn words, you have to do two things: study them and then practice using them.

Degree of agreement	% of responses
Strongly agree	65.9%
Agree	34.1%
Not sure	0%
Disagree	0%
Strongly disagree	0%

Table 14: I find vocabulary learning interesting

Degree of agreement	% of responses
Strongly agree	9.8%
Agree	43.9%
Not sure	29.3%
Disagree	17.1%
Strongly disagree	0%

Table 15: I like to learn more words than what I encounter in my academic work

Degree of agreement	% of responses
Strongly agree	24.4%
Agree	46.3%
Not sure	22%
Disagree	7.3%
Strongly disagree	0%

Table 16: I am motivated to learn vocabulary because it is important for passing tests.

Degree of agreement	% of responses
Strongly agree	19.5%
Agree	46.3%
Not sure	17.1%
Disagree	17.1%
Strongly disagree	0%

Table 17: I feel bored or frustrated while learning vocabulary.

Degree of agreement	% of responses
Strongly agree	4.9%
Agree	31.7%
Not sure	17.1%
Disagree	34.1%
Strongly disagree	12.2%

Table 18: I find the imagery/pictures used to represent certain vocabulary in English language text books unfamiliar.

Degree of agreement	% of responses
Strongly agree	9.8%
Agree	17.1%
Not sure	48.8%
Disagree	22%
Strongly disagree	2.4%

Table 19: I feel finding associations between new words and imagery from my country and culture makes it easier to remember their meanings.

Degree of agreement	% of responses
Strongly agree	9.8%
Agree	48.8%
Not sure	29.3%
Disagree	9.8%
Strongly disagree	2.4%

Table 20: I believe my first language is an important resource in developing my English vocabulary

Degree of agreement	% of responses
Strongly agree	17.1%
Agree	31.7%
Not sure	36.6%
Disagree	9.8%
Strongly disagree	4.9%

Section 3: Vocabulary Strategy Use

Rehearsals: Using word lists

Table 21: I make vocabulary flashcards for new words so that I can memorize them.

Frequency of use	% of responses
I always do that	2.4%
I often do that	7.3%
I sometimes do that	24.4%
I rarely do that	36.6%
I never do that	29.3%

Table 22: I keep lists of new vocabulary words

Frequency of use	% of responses
I always do that	14.6%
I often do that	24.4%
I sometimes do that	36.6%
I rarely do that	14.6%
I never do that	14.6%

Table 23: I go through my vocabulary list several times until I am sure I know all of the words on the list.

Frequency of use	% of responses
I always do that	4.9%
I often do that	14.6%
I sometimes do that	41.5%
I rarely do that	17.1%
I never do that	22%

Table 24: I regularly review new words I have memorized

Frequency of use	% of responses
I always do that	7.3%
I often do that	9.8%
I sometimes do that	43.9%
I rarely do that	26.8%
I never do that	12.2%

Summary: Rehearsals: Using word lists

Table 25: Rehearsals: Using word lists

Frequency of use	% of responses
I make vocabulary flashcards for new words so that I can memorize them.	9.7%
I keep lists of new vocabulary words.	39%
I go through my vocabulary list several times until I am sure I know all of the words on the list.	19.5%
I regularly review new words I have memorized	17.1%
Percentage of participants who always and often use these strategies	21.3%

Rehearsals: Oral repetition

Table 26: Repeating a new word aloud helps me to remember it

Frequency of use	% of responses
I always do that	19.5%
I often do that	29.3%
I sometimes do that	29.3%
I rarely do that	12.2%
I never do that	9.8%

Table 27: When I am studying new words, I repeat them silently in my mind

Frequency of use	% of responses
I always do that	24.4%
I often do that	29.3%
I sometimes do that	34.1%
I rarely do that	7.3%
I never do that	4.9%

Summary: Rehearsals: Oral repetition

Table 28: Rehearsals: Oral repetition

Strategy	% of responses
Repeating a new word aloud helps me to remember it	48.8%
When I am studying new words, I repeat them silently in my mind	53.7%
Percentage of participants who always and often use these strategies	51.2%

Rehearsals: written repetition

Table 29: When I try to remember a word, I write it repeatedly.

Frequency of use	% of responses
I always do that	17.1%
I often do that	24.4%
I sometimes do that	36.6%
I rarely do that	17.1%
I never do that	7.3%

Table 30: I write both the new words and their translations repeatedly in order to remember

Frequency of use	% of responses
I always do that	9.8%
I often do that	17.1%
I sometimes do that	14.6%
I rarely do that	31.7%
I never do that	26.8%

Rehearsals:

Summary: Rehearsals: Written repetition

Table 31: Rehearsals: written repetition

Strategy	% of responses
When I try to remember a word, I write it repeatedly.	41.5%
I write both the new words and their translations repeatedly in order to remember them.	26.9%
Percentage of participants who always and often use these strategies	34.2%

Encoding: Associations

Table 32: To remember a new word, I put it into an English sentence

Frequency of use	% of responses
I always do that	2.4%
I often do that	26.8%
I sometimes do that	43.9%
I rarely do that	19.5%
I never do that	9.8%

Table 33: I link a new word to an English word that sounds similar

Frequency of use	% of responses
I always do that	2.4%
I often do that	14.6%
I sometimes do that	31.7%
I rarely do that	17.1%
I never do that	34.1%

Table 34: I link a new word to its meaning in my first language

Frequency of use	% of responses
I always do that	34.1%
I often do that	26.8%
I sometimes do that	22%
I rarely do that	4.9%
I never do that	12.2%

Table 35: I associate words that sound similar.

Frequency of use	% of responses
I always do that	4.9%
I often do that	17.1%
I sometimes do that	43.9%
I rarely do that	14.6%
I never do that	24.4%

Table 36: I associate words that look similar

Frequency of use	% of responses
I always do that	4.9%
I often do that	17.1%
I sometimes do that	41.5%
I rarely do that	22%
I never do that	14.6%

Summary: Encoding – Associations

Table 38: Encoding – Associations

Strategy	% of responses
To remember a new word, I put it into an English sentence	29.2%
I link a new word to an English word that sounds similar	17%
I link a new word to its meaning in my first language	60.9%
I associate words that sound similar.	22%
I associate words that look similar	29%
Percentage of participants who always and often use these strategies	31.6%

Encoding: Imagery

Table 39: I act out a word to remember it better.

Frequency of use	% of responses
I always do that	0%
I often do that	19.5%
I sometimes do that	41.5%
I rarely do that	14.6%
I never do that	24.4%

Table 40: I create a mental image of the new word to help me remember it.

Frequency of use	% of responses
I always do that	4.9%
I often do that	17.1%
I sometimes do that	29.3%
I rarely do that	31.7%
I never do that	17.1%

Table 41: I associate one or more letters in a word with the word meaning to help me remember it (e.g., *look* has two “eyes” in the middle).

Frequency of use	% of responses
I always do that	2.4%
I often do that	7.3%
I sometimes do that	14.6%
I rarely do that	24.4%
I never do that	51.2%

Summary: Encoding imagery

Table 42: Encoding imagery

strategy	% of responses
I act out a word to remember it better.	19.5%
I create a mental image of the new word to help me remember it	22%
I associate one or more letters in a word with the word meaning to help me remember it	9.7%
Percentage of participants who always and often use these strategies	20.3%

Encoding: Visual encoding

Table 43: I visualize the new word to help me remember it.

Frequency of use	% of responses
I always do that	2.4%
I often do that	36.6%
I sometimes do that	34.1%
I rarely do that	19.5%
I never do that	7.3%

Table 44: I learn the spelling of a word by breaking it into several parts

Frequency of use	% of responses
I always do that	22%
I often do that	29.3%
I sometimes do that	26.8%
I rarely do that	17.1%
I never do that	4.9%

Summary: Visual encoding

Table 45: Visual encoding

Strategy	% of responses
I visualize the new word to help me remember it.	39%
I learn the spelling of a word by breaking it into several parts	51.3%
Percentage of participants who always and often use these strategies	45.1%

Encoding: Semantic encoding

Table 46: I try to remember words in meaningful groups

Frequency of use	% of responses
I always do that	9.8%
I often do that	22%
I sometimes do that	34.1%
I rarely do that	22%
I never do that	12.2%

Table 47: I group words into categories (e.g., animals, vegetables) to remember them.

Frequency of use	% of responses
I always do that	7.3%
I often do that	9.8%
I sometimes do that	26.8%
I rarely do that	29.3%
I never do that	26.8%

Summary: Semantic encoding

Table 48: Semantic encoding

Strategy	% of responses
I try to remember words in meaningful groups	31.8%
I group words into categories to remember them	17.1%
Percentage of participants who always and often use these strategies	24.4%

Encoding: Contextual encoding

Table 49: When I want to remember the meaning of a word, I try to recall a sentence in which the word was used.

Frequency of use	% of responses
I always do that	4.9%
I often do that	19.5%
I sometimes do that	48.8%
I rarely do that	22%
I never do that	7.3 %

Table 50: I remember new words along with the context in which they occur.

Frequency of use	% of responses
I always do that	14.6%
I often do that	46.3%
I sometimes do that	29.3%
I rarely do that	4.9%
I never do that	4.9%

Table 51: I learn words better when I put them in context (sentences).

Frequency of use	% of responses
I always do that	0%
I often do that	41.6%
I sometimes do that	17.1%
I rarely do that	14.6%
I never do that	0%

Summary: contextual encoding

Table 52: contextual encoding

Strategy	% of responses
When I want to remember the meaning of a word, I try to recall a sentence in which the word was used.	24%
I remember new words along with the context in which they occur.	60.9%
I learn words better when I put them in context (sentences).	41.6%
Percentage of participants who always and often use these strategies	42.1%

Encoding: Word structure

Table 53: When I learn new words, I analyze them in terms of their prefixes, stems and suffixes.

Frequency of use	% of responses
I always do that	4.9%
I often do that	22%
I sometimes do that	29.3%
I rarely do that	29.3%
I never do that	14.6%

Table 54: I study word-formation rules in order to remember more words.

Frequency of use	% of responses
I always do that	7.7%
I often do that	15.4%
I sometimes do that	35.9%
I rarely do that	25.5%
I never do that	15.4%

Summary : Encoding word structure

Table 55: Encoding word structure

Strategy	% of responses
When I learn new words, I analyze them in terms of their prefixes, stems, and suffixes.	26.9%
I study word-formation rules in order to remember more words.	23.1%
Percentage of participants who always and often use these strategies 25%	

Dictionary strategy

Table 56: I use monolingual dictionaries to find meanings of new words

Frequency of use	% of responses
I always do that	17.1%
I often do that	17.1%
I sometimes do that	31.7%
I rarely do that	24.4%
I never do that	9.8%

Table 57: I use bilingual dictionaries to find meanings of new words.

Frequency of use	% of responses
I always do that	24.4%
I often do that	14.6%
I sometimes do that	34.1%
I rarely do that	9.8%
I never do that	17.1%

Table 58: When I see an unfamiliar word again and again, I look it up.

Frequency of use	% of responses
I always do that	51.2%
I often do that	29.3%
I sometimes do that	19.5%
I rarely do that	0%
I never do that	0%

Table 59: When not knowing a word prevents me from understanding a whole sentence or even a whole paragraph, I look it up.

Frequency of use	% of responses
I always do that	36.6%
I often do that	24.4%
I sometimes do that	31.7%
I rarely do that	7.3%
I never do that	0%

Summary: Dictionary strategies

Table 60: Dictionary strategies

Strategy	% of responses
I use monolingual dictionaries to find meanings of new words	34.2%
I use bilingual dictionaries to find meanings of new words	39%
When I see an unfamiliar word again and again, I look it up.	80.5%
When not knowing a word prevents me from understanding a whole sentence or even a whole paragraph, I look it up.	61%
Percentage of participants who always and often use these strategies	53.7%

Note taking strategies

Table 61: I make a note of words that seem important to me.

Frequency of use	% of responses
I always do that	26.8%
I often do that	19.5%
I sometimes do that	24.4%
I rarely do that	19.5%
I never do that	9.8%

Table 62: When I see an expression or phrase that I think I will want to use someday, I write it down for future references

Frequency of use	% of responses
I always do that	22%
I often do that	14.6%
I sometimes do that	39%
I rarely do that	14.6%
I never do that	9.8%

Summary: Note taking strategies

Table 63: Note taking strategies

Strategy	% of responses
I make a note of words that seem important to me.	46.3%
When I see an expression or phrase that I think I will want to use someday, I write it down for future references	36.6%
Percentage of participants who always and often use these strategies	41.4%

Guessing strategies

Table 64: I make use of context to guess the meaning of a word I do not know

Frequency of use	% of responses
I always do that	19.5%
I often do that	34.1%
I sometimes do that	34.1%
I rarely do that	4.9%
I never do that	7.3%

Table 65: When I guess the meaning of a word, I analyze its parts (prefix, root, and suffix).

Frequency of use	% of responses
I always do that	14.6%
I often do that	24.4%
I sometimes do that	34.1%
I rarely do that	9.8%
I never do that	17.1%

Summary: guessing strategies

Table 66: guessing strategies

Strategy	% of responses
I make use of context to guess the meaning of a word I do not know.	53.6%
When I guess the meaning of a word, I analyze its parts (prefix, root, and suffix	39%
Percentage of participants who always and often use these strategies	46.3%

Activation strategy

Table 67: I try to use newly learned words as much as possible when I write or speak

Frequency of use	% of responses
I always do that	7.3%
I often do that	34.1%
I sometimes do that	29.3%
I rarely do that	29.3%
I never do that	0%

Table 68: I try to use newly learned words in imaginary situations in my mind

Frequency of use	% of responses
I always do that	2.4%
I often do that	26.8%
I sometimes do that	41.5%
I rarely do that	22%
I never do that	7.3%

Summary: Activation strategies

Table 69: Activation strategies

Strategy	% of responses
I try to use newly learned words as much as possible when I write or speak.	41.4%
I try to use newly learned words in imaginary situations in my mind.	29.2%
Percentage of participants who always and often use these strategies	35.3%

Using technology to study vocabulary

Table 70: I like to use online dictionaries to look up new words.

Frequency of use	% of responses
I always do that	65.9%
I often do that	12.2%
I sometimes do that	14.6%
I rarely do that	7.3%
I never do that	0%

Table 71: I look up the mother tongue equivalent of new English words in online dictionaries.

Frequency of use	% of responses
I always do that	24.4%
I often do that	29.3%
I sometimes do that	22%
I rarely do that	14.6%
I never do that	12.2%

Table 72: I use online applications to study new words.

Frequency of use	% of responses
I always do that	26.8%
I often do that	17.1%
I sometimes do that	24.4%
I rarely do that	14.6%
I never do that	17.1%

Table 73: I use mobile devices to study new words

Frequency of use	% of responses
I always do that	36.6%
I often do that	26.8%
I sometimes do that	9.8%
I rarely do that	19.5%
I never do that	7.3%

Summary: Using technology

Table 74: Using technology

Strategy	% of responses
I like to use online dictionaries to look up new words.	78 %
I look up the mother tongue equivalent of new English words in online dictionaries	53.7%
I use online applications to study new words.	43.9%
I use mobile devices to study new words	63.4%
Percentage of participants who always and often use these strategies	59.7%

Affective strategies

Table 75: I use my mother tongue when learning new vocabulary

Frequency of use	% of responses
I always do that	17.1%
I often do that	24.4%
I sometimes do that	29.3%
I rarely do that	14.6%
I never do that	14.6%

Table 76: If I feel bored or frustrated while learning vocabulary, I take a break or I remind myself that vocabulary is important, and then I go on

Frequency of use	% of responses
I always do that	12.5%
I often do that	27.5%
I sometimes do that	22.5%
I rarely do that	20%
I never do that	17.5%

Summary: Affective strategies

Table 77: Affective strategies

Strategy	% of responses
I use my mother tongue when learning new vocabulary	41.5%
If I feel bored or frustrated while learning vocabulary, I take a break or	40%
I remind myself that vocabulary is important, and then I go on	
Percentage of participants who always and often use these strategies	40.7%

Social Strategies: Communication and cooperation

Table 78: When I encounter a new word, I would turn to a teacher for its meaning

Frequency of use	% of responses
I always do that	0%
I often do that	2.4%
I sometimes do that	22%
I rarely do that	41.5%
I never do that	34.1%

Table 79: I review new words with my colleagues. (one says an English word, the other translates it into Mother tongue)

Frequency of use	% of responses
I always do that	2.4%
I often do that	7.3%
I sometimes do that	12.2%
I rarely do that	39%
I never do that	39%

Table 80: I share my experience and feelings in vocabulary learning with others

Frequency of use	% of responses
I always do that	2.5%
I often do that	12.5%
I sometimes do that	27.5%
I rarely do that	37.5%
I never do that	20%

Summary: Social Strategies: Communication and cooperation

Table 81: Social Strategies: Communication and cooperation

Strategy	% of responses
When I encounter a new word, I would turn to a teacher for its meaning.	2.4%
I review new words with my colleagues. (one says an English word, the other translates it into Mother tongue)	9.7%
I share my experience and feelings in vocabulary learning with others	14%
Percentage of participants who always and often use these strategies	8.7%