ESP Vocabulary Learning Strategies

The Effect of Self-Esteem, Self-Regulation and Learning Styles

Eirene Katsarou

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To my son, Andrew

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List of Abbreviations

AC	Abstract Conceptualization
AE	Active Experimentation
AL	Applied Linguistics
ASSOC	Association Strategies
CONS	Consolidation Strategies
CE	Concrete Experience
CSA	Riding's Cognitive Styles Analysis
DU	Dictionary-Use Strategies
ECTS	European Credit Transfer System
EAP	English for Academic Purposes
EFL	English for Foreign Learners
ESP	English for Specific Purposes
FLSES	Foreign Language Self-esteem Scale
FTF	Face to Face
GSD	Gregorc's Style Delineator
IDs	Individual Differences
ILS	Index of Learning Styles
JFS	Janis-Field Feelings of Inadequacy Scale
M	Memorization Strategies
MBTI	Myers-Briggs Type Indicator
MR	Multiple Regression
NT	Note-keeping Strategies
LG	Lexical Guessing Strategies
LSI	Kolb's Learning Style Inventory
LSP	Jackson's Learning Style Profiler
LLS	Language Learning Strategies
LSS	Learning Styles Survey
PEPS	Productivity Environmental Preference Survey
PLSPQ	Perceptual Learning Style Preferences Questionnaire
REP	Repetition Strategies
RO	Reflective Observation
SD	Social-Discovery Strategies
SAS	Style Analysis Survey
S^2R	Strategic Self-Regulation Model
SI	Socio-cultural-interactive strategies

SILL	Strategy Inventory of Language Learning
SLA	Second Language Acquisition
SRC (voc)	Self-Regulating Capacity in Vocabulary Learning
SRL	Self-Regulating Learning
SRSD	Self-Regulated Strategy Development
SSES	State Self-esteem Scale
VARK Model	Visual-Aural-Read Write-Kinesthetic Model
VLS	Vocabulary Learning Strategies
VLS-Q	Vocabulary Learning Strategies Questionnaire
VLT	Vocabulary Levels Test
VOLSI	Vocabulary Learning Strategy Inventory
WTC	Willingness to Communicate
ZPD	Zone of Proximal Development

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INTRODUCTION

Vocabulary is seen in the literature as 'the most sizable and unmanageable component in the learning of any language, whether a foreign or one's mother tongue, because of tens of thousands of different meanings' (Oxford 1990, 39-40). According to Meara (1984), some researchers have neglected vocabulary, while others consider it to be an unequivocally integral component in the successful acquisition of another language due to its critical role in the development of both receptive and productive language skills (Schmitt 2000; Nation 2001; Gu 2002) and, therefore, in the enhancement of overall communicative skills in foreign language performance (Milton 2013). Large vocabularies, speed, and depth of vocabulary knowledge are empirically found to be reliable predictors of good performance in foreign language learning across learners from different proficiency levels (e.g., Staer 2008; Milton et al. 2010) as they enable EFL (English as a Foreign Language) and ESP (English for Specific Purposes) learners alike to effectively overcome their lexical problems in receptive (Huckin 1995; Laufer 1992) and productive tasks (Coxhead 2012; Hyland and Tse 2007; Durrant 2014) and to learn and use the language effectively in all learning contexts.

The research of vocabulary learning strategies (VLS) in a foreign language, which originally stems from research into Language Learning Strategies (LLS) in the 1970s, has gained rapid interest in the last two decades in an effort to explore the role and benefits of VLS for effective vocabulary acquisition (e.g., Ahmed 1988; Sanaoui 1995; Kojic-Sabo and Lightbown 1999; Gu 2003). While a few studies have examined a comprehensive set of VLS (e.g., Schmitt 1997, Marin 2005, Al-Qahtani 2005), most research carried out on L2 lexical learning has either focused on individual strategies (e.g., guessing, dictionary use), a subgroup of them in general (e.g., word attack strategies in Alseweed 1996) or a limited number of them in certain language skills such as reading (e.g., Alyami 2006). Nevertheless, VLS research is still evolving as compared to other areas of Applied Linguistics (AL) (Marin 2005), and intensive research is being conducted in the direct aspects of vocabulary teaching such as the management of lexical learning by reducing vocabulary load, dealing with specific learning difficulties, and effective methods for lexical teaching (Laufer and Kimmel 1997). This suggests a need for more

in depth VLS studies on EFL and ESP educational contexts worldwide, and the Greek study context is no exception.

Interestingly, the number of empirical studies addressing the use of vocabulary learning strategies by ESP learners, in general, and in relation to such specific individual and affective factors as self-esteem, self-regulation capacity, and language learner styles remains strikingly limited. In acknowledging the fact that acquisition of specialized vocabulary in English is tightly related to content knowledge of the discipline aiding university ESP learners to cope with their studies in academic and professional environments (Coxhead 2018), recent corpus-related research in the area has been heavily focused on methods to delimit technical vocabulary (Chung and Nation 2003) per subject area via the compilation of discipline-specific Word Lists (e.g., Nekrasova-Beker et al. 2019; Martinez et al. 2009; Wang et al. 2008) to serve as useful frameworks in organizing ESP vocabulary modules and teaching materials. However, such a situation is particularly awkward given the usage of English as a medium of international communication in a wide array of subjects ranging from technology to science, economics, medicine, and life sciences (Floris 2013). Hence, ESP learners' need to succeed in their subject-specific and, ultimately, occupational goals' using English (Akhbari 2011, 7).

Evidence from relevant empirical research carried out by Woodward - Kron (2008) in a longitudinal study using undergraduate students' academic writing in education found that students' knowledge of a discipline is closely tied to the specialized language of that discipline and that understanding and use of this special-purpose vocabulary shows that these learners form a particular group that needs this kind of language "showing that understanding make meaning and engage with disciplinary knowledge" (Woodward – Kron 2008, 246). Obviously, it seems that second and foreign language learners need a large technical vocabulary to cope with their studies in academic or professional environments (Evans & Morrison 2011; Coxhead et al. 2016), but as estimates of the size of a technical vocabulary are difficult to be accurately determined in any given text (Nation 2013; Nation and Coxhead 2014), we feel that an investigation of the types of VL strategies used by L2 ESP learners is imperative to determine the extent to which they resort to them to discover the meaning of unknown technical words, retain newly acquired words, store them in their memories, and use them in practice.

Self-regulation and Language Learning Strategies

Although many different learner-related factors are considered throughout the literature. In relation to the study of language learning strategies in L2 contexts (e.g., Skehan 1991; Ehrman et al. 2003), our initial motivation to first focus on the role of self-regulating capacity in the process of L2 vocabulary acquisition coincides with a shift in the research paradigm noticed throughout the last decade in the study of language learning strategies. This new era has been clearly marked by the articulation of Oxford's (2017, 95) Strategic Self-Regulation Model (S^2R), where "self-regulation, agency and autonomy, growth mindsets, self-efficacy, resilience, hope, and internal attributions for success" are characterized by the researcher as essential characteristics of 'the soul of learning strategies". According to Oxford's (2017; 1999) view, the linkage between learning strategies and self-regulation is forged via the socio-cultural and psychological overtones associated with the latter, and vastly originating from Vygotsky's theory of mediated learning, the zone of proximal development (ZPD), self-regulation as well as theories of educational psychology, most notable among the others proposed by Schunk and Ertmer (2000) and Zimmerman and Schunk (2011) who described self-regulation as a set of strategies, all fundamental to the learning process and involving goal-setting; focusing on instruction; organizing, coding, and rehearsing information; managing time and the environment; using resources effectively; monitoring performance; seeking assistance.

In Oxford's terms (1999, 111), the psychological concept of self-regulation lies at the heart of autonomous learning as it implicitly involves the use of the meta-cognitive learning strategies of planning, guiding, monitoring, organizing, and evaluating deemed to be fundamental for the internalization of 'higher-order cognitive learning strategies. Despite Gao's (2007) conviction that the model of self-regulating capacity is not incompatible with language learning strategies measuring the same event from different perspectives, i.e., self-regulation involves the initial driving forces of language learning and strategy research that examines the outcome of these forces, Griffiths (2020) also pointedly emphasizes that research on language learning strategies remains vibrant with self-regulation at its core arguing for the need to acknowledge diversity and to engage in productive debate.

However, despite the pedagogically indispensable contribution of strategic competence (Oxford 1990; Gunning and Oxford 2014; Ma and Oxford 2014) and self-regulation (Zimmerman and Schunk 2001) in autonomous language learning process, overall proficiency in a

foreign/second language (Kim et al. 2015; Ekhlasa and Shangarffam 2013) and academic achievement in general (Camahalan 2006; Cekolin 2001; Erdogan, 2011), the notion of self-regulation has only recently been included in language learning strategy research (e.g., Tsuda and Nakata 2013; Brown and White 2010; Nakata 2010). In this respect, following Weinstein, Acee and Jung (2011, 47) strategies and self-regulation exist interdependently in the language learning process as "the glue and the engine that helps students manage their strategic learning" and, in an effort to fill this gap in research, our study examines university ESP learners' use of vocabulary learning strategies when learning technical vocabulary in the disciplines of Agriculture and Forestry to determine the vocabulary learning strategies that ESP learners most commonly prefer to use throughout their ESP course and, subsequently, investigate the extent of self-regulation capacity they exhibit in the process, and whether they favour the use of specific vocabulary strategies in particular.

Self-esteem and Language Learning Strategies

The selection of self-esteem as the second explanatory variable of VLS use by ESP learners can also be traced to Oxford's (2017, 115) Strategic Self-Regulation Model (S^2R), as it implicitly seems to constitute a crucial factor contributing to 'empowered and effective L2 learning alongside other related strength factors such as self-efficacy, resilience, hope, and internal attributions for success. In line with the researcher's belief, the pedagogical expediency of these factors in the L2 learning process lies in the fact that 'they are potentially tied to the use of learning strategies and self-regulation as well as that they are all related in one way or another to beliefs [implicit or explicit] about the self in context' (Oxford 2017, 115) that can, in turn, affect individuals' approaches to L2 learning and learning in general (Williams et al. 2015).

Interestingly, of all the affective factors, self-efficacy and, by association, self-esteem (i.e., a global or situational high-low evaluation of oneself in terms of competence and worthiness in interactions with the world), is related to agency (Bandura 2002; 2008), L2 learning strategy use (Chamot 2004; Chamot Barnhardt, El-Dinar and Robbins 1996), a growth mindset (Mercer and Williams 2014), and overall psychological and physical well-being (Oxford 2016) and self-regulation itself in the pursuit of desired goals. Following Maddux (2011), "self-regulation (simplified) depends on three interacting components …: goals or standards of performance, self-evaluative reactions to performance, and self-efficacy beliefs. Self-efficacy beliefs influence the goals we set, our choices of goal-directed

behavior, our degree of effort, our persistence, and the efficiency and effectiveness of our problem-solving". Self-efficacy, self-concept, and self-esteem overlap as they are all forms of self-appraisal, i.e., self-evaluation related to an individual's observation and reflection on one's values and attributes capacities (Habrat 2018). Mercer claims (2011a; Pajares and Miller 1994) that the construct of self-efficacy is more cognitive in nature than self-concept or self-esteem, describing it as a more affective response to self (Schunk and Pajares 2002) with tremendous influence on human behaviour.

Given the absence of studies examining the role of self-esteem in relation to L2 strategy use in empirical terms, the current research investigates a sample of ESP learners in tertiary education in Greece to explore the extent to which self-esteem influences the use of vocabulary learning strategies when learning new technical vocabulary and determine the strength of interactions between self-esteem, self-regulation and learning styles as predictor variables of VLS frequency of use. We believe that the insights gained from this study may translate into practical pedagogical advice applicable in foreign language classrooms, catering for an ego-protecting, learner-friendly atmosphere.

Learning Styles and Language Learning Strategies

The study of cognitive and learning styles within Second Language Acquisition (SLA) has long been an interesting puzzle as well as studies of style representing a clear case of importing a concept from the neighboring field of psychology in a manner that has proved simultaneously attractive and unsatisfactory (Dorneyi and Skehan 2003). The various factors most commonly cited for the attractiveness of learning style concepts by SLA researchers stems from a growing appreciation for their contribution to language learning success and learning strategy use in recent ESL/EFL classroom research (e.g., Carrell and Monroe 1993; Carrell et al. 1996; Wen and Johnson 1997). Oxford (2003, 1) emphasizes that "language learning styles and strategies are among the main factors that help to determine how –and how well –our students learn a second or foreign language". Ma (2002) further argues for the salient contribution of learning styles to L2 vocabulary knowledge as they affect the knowledge eventually gained. As distinct as these notions: language learning strategies and learning styles, they both contain cognitive and affective elements and are good predictors of L2 language proficiency. Brown (1994) further points out that learning strategies do not operate by themselves, but rather are directly linked to the learner's innate learning

styles and other personality-related factors, while Oxford (1990b) suggests that the notion of learning style encompasses the learners' general inclination to use certain learning strategies while avoiding others. In Cohen's (2012, 142) terms, "language learning and use strategies do not operate in a vacuum, but rather are directly tied to learners' underlying learning style preferences" (i.e., their general approaches to and preferred ways of learning).

In acknowledging the influential role of learning styles and learning strategies in the L2 teaching and learning, Denig (2004) suggests that it is important for teachers to diversify their teaching techniques to match their students' different styles by aiding learners to identify their style preferences (known as a "comfort zone") and extending from it through practice (Oxford, 2001). Zhou (2011, 73) further stresses the need for teachers to be cognizant of their students' learning styles as "this knowledge will help teachers to plan their lessons to match or adapt their teaching and provide the most appropriate and meaningful activities or tasks to suit a particular learner group at different stages". In this sense, understanding learning styles can help instructors design appropriate activities for students and allow teachers to do this systematically. As such, extensive research into students' learning styles and strategies in different contexts and across different disciplines seems necessary (e.g., Psaltou and Kantaridou 2011; Lau and Gardner 2019). In recent years, language learning strategies and styles have been studied in relation to a number of variables in various contexts.

However, thus far, no empirical studies have examined students' vocabulary learning strategy use and learning styles in EFL or ESP learning contexts. While research into the extent to which L2 learners' learning styles influence VLS use may contribute to the improvement of L2 vocabulary learning and teaching situation, hardly any studies have been conducted to identify the association between Greek ESP learners' vocabulary learning styles and strategies in any particular field of study. Hence one of the purposes of the present study is to examine the possible relationships between learning style preferences and vocabulary language learning strategies used by Greek university L2 students.

The study reported in this book investigates the frequency of vocabulary strategy use among undergraduate ESP learners and, at the same time, explores whether significant differences arise in VLS use based on gender and vocabulary knowledge level in a Greek educational context. It contributes to the general understanding of the extent to which L2 learners' degree of self-regulatory competency in L2 vocabulary acquisition, degree of self-esteem, as well as dominant individual style preferences affect

frequent VLS use both in categories and separately within the context of a Greek university educational setting. The need for this research is attributed to two reasons: (i) the salient role of self-regulation in relation to overall strategic competence and success in L2 language learning proficiency (Oxford 2017; Griffiths 2020), (ii) the limited research attention that self-esteem as an affective factor and learning style has received in relation to the study of L2 vocabulary competence and vocabulary learning strategy use. As a result, our study employs an exploratory character and is primarily based on previous research undertaken generally within the SLA and L2 language learning strategy areas.

More specifically, this study investigates the contribution of ESP Greek learners' self-regulation capacity in vocabulary learning, the degree of self-esteem of L2 language learners, and the reported learning style to the frequency with which they adapt to VLS. Gender and vocabulary proficiency are also considered in this investigation, and potential differences are addressed with respect to L2 learners' use of VLS as well as their self-reported self-regulatory competence in vocabulary learning. Another relevant objective of this investigation is to describe the VLS patterns of L2 university learners regardless of their degree of self-regulation, self-esteem, learning style, vocabulary proficiency, and gender. The purpose of this is to explore what VLS are used most and least frequently across the entire sample and to what extent L2 learners differ with respect to some types of VLS, such as, for example, the use of bilingual and monolingual dictionaries, among other interesting comparisons also presented in the relevant literature.

We believe that this study might prove useful to both language teachers and learners. It will enrich L2 teachers' knowledge on the role of self-regulation, self-esteem and learning styles on L2 learners' vocabulary learning process and aid their effort to make the learning environment productive, satisfying, and self-rewarding. To this end, the present study adopts a survey-based approach to explore how the multi-dimensional notion of self-regulation conditions L2 learners VLS use while learning new English vocabulary in an ESP university context. Also, it explores the roles of affective learner-internal variables such as L2 self-esteem and learning styles throughout the L2 vocabulary learning process with the ultimate goal of providing some useful empirical evidence that can further be translated into useful pedagogical guidelines for the EFL and ESP class. To achieve this, the present study adopts a correlational method and seeks to determine which of these three independent variables is the best predictor of VLS use for this sample of learners.

An Overview of the Book

As already shown throughout this introductory chapter, this study focuses on the self-reported VLS use of Greek students in a university context and determine the extent to which VLS use is influenced by (i) self-regulatory capacity, (ii) self-esteem and, (iii) learning styles in an ESP environment. Overall, this book is organized into four chapters. Chapter One presents the relevant literature on the main strategy classification systems (Naiman et al. 1978; Rubin 1981; O'Malley and Chamot 1990; Oxford 1990) and overall VLS use research. Chapter Two is an overview of relevant research on the learner variable factors affecting the use of VLS in our study, i.e., self-regulation, self-esteem, and language learning styles.

Chapter Three presents the research questions and hypotheses posited as well as the methodology of our study. It provides a detailed description of the subjects, instruments, and procedures for the study. Data analysis and coding methods, as well as the statistical methods used in responding to the questions and hypotheses are also contained in this chapter. Key results of the main study are also presented and discussed in the second half of the chapter. This section is divided into four main sections devoted to the quantitative analysis starting with an overall picture of VLS use among the entire sample. Section two presents the results and discusses the relationship between self-regulation, gender, vocabulary knowledge, and overall VLS use, separate and in categories. Section three covers the findings regarding the relationship between (a) self-esteem and the use of separate VLS, (b) self-esteem and the use of VLS in categories, and (c) self-esteem and overall use of VLS. Section four covers the findings regarding the relationship between (a) learning styles and the use of separate VLS, (b) learning styles and the use of VLS in categories, and (c) learning styles and overall use of VLS. Finally, Chapter Four provides a summary of the major findings and the general conclusions of the study, followed by useful implications for vocabulary strategy training in EFL and ESP educational contexts alike and suggestions for future research in the area of vocabulary strategy in second language learning settings.

CHAPTER 1

L2 EMPIRICAL RESEARCH ON VOCABULARY LEARNING STRATEGIES

1.1. Introduction

Being generally viewed as a subset of general Language Learning Strategy (LLS), it seems sensible to provide an account of the key aspects relevant to the wide research area of vocabulary learning strategies (VLS). In broad terms, this chapter consists of four main sections that provide a thorough account of VLS research from a foreign language educational contexts through discussion of issues primarily pertaining to VLS definitions in the area of second language learning and their classification in selected VLS taxonomies presented in the second section of the chapter. This discussion is followed by an overview of relevant studies akin to our study and concerned with the general use of VLS in EFL and ESP contexts in the third and fourth sections, and therefore, necessary as our conceptual framework.

1.2. Key Taxonomies of Vocabulary Learning Strategies (VLS)

In defining VLS, we are faced with a scarcity of definitions as most of them are centered around the construct of LLS (Nation 2001). In attempting to define VLS, Schmitt (1997) initially draws on Rubin's (1987, 29) definition of LLS, which views learning as “the process by which information is obtained, stored, retrieved, and used”. Thus, Schmitt observed that VLS “could be any [strategies] which affect this rather broadly-defined process” (Schmitt 1997, 203), suggesting that VLSs can be observable or not, conscious or unconscious, and aim to learn vocabulary. Nevertheless, this definition sounds rather general, and seemingly no explicit indication of VLS is made.

A more concrete and detailed definition of VLS is offered by Jimenez-Catalan (2003, 56), who defines VLS as "knowledge about the mechanism (processes strategies) used to learn vocabulary and the steps or actions taken by students (a) to find out the meaning of unknown words, (b) to retain them in long-term memory, (c) to recall them at will, and (d) to use them in oral or written mode". Such a definition seems to focus on two types of strategies involved in L2 vocabulary acquisition, i.e., meta-cognitive strategies (knowledge about the mechanism of vocabulary learning) and cognitive strategies (actions taken), reflecting somewhat of Anderson's (2005) three-stage process of vocabulary learning. Catalan based her definition of VLS only on the meaning of the word to be learned, excluding other important aspects of the word knowledge to be acquired by learners such as form and proper use in example-sentences.

Moreover, Nation (2001, 217) draws on important characteristics of a strategy to arrive at a definition of VLS as follows: a strategy would need to: first, involve choice, that is, there are several strategies to choose from: second, be complex, i.e., there are several steps to learn though this feature is not applicable to all strategies, such as in the case of repetition. Third, it requires knowledge and benefits from training though some argue that strategies cannot be taught or there is no benefit from training students in strategies. Fourth, a strategy increases the efficiency of vocabulary learning and vocabulary use. This implies that strategies are by definition beneficial and cannot be included as a defining feature of a VLS. These are intended to help the users, except the well-known "unhelpful" ones like over-reliance on internal word clues when guessing.

Following the LLS strategy research conducted by Oxford (1990a), Cohen (1998) and O'Malley and Chamot (1990), Marin (2005, 74) offers a more comprehensive definition of VLS as "those conscious and unconscious, planned and unplanned steps and actions that L2 learners take to discover and consolidate the form, meaning and usage of words", hence highlighting four important aspects of vocabulary learning, i.e., (i) the conscious and unconscious aspect, (ii) planned and unplanned actions or steps that touch upon meta-cognitive strategies, (iii) discovery and consolidation strategies which assume deliberate actions done by the learner, and (iv) linguistic aspects related to the identified word such as grammatical category, meaning, and usage. In this section, the focus will be on the key VLS taxonomies such as Schmitt (1997), Stoffer (1995), Gu and Johnson (1996), and Nation (2001).

1.2.1. Stoffer's (1995) VLS Taxonomy

Stoffer (1995) produced the Vocabulary Learning Strategy Inventory (VOLSI), which included a questionnaire containing 53 items designed to assess vocabulary learning strategies. She used factor analysis to classify the categories. The 53 items were clustered into nine categories as follows:

1. Strategies involving authentic language use.
2. Strategies used for self-motivation.
3. Strategies used to organize words
4. Strategies used to create mental linkages.
5. Memory Strategies.
6. Strategies involving creative activities.
7. Strategies involving physical actions.
8. Strategies used to overcome anxiety.
9. Auditory strategies.

Since she used actual data from learners to create her categories of VLS, the factors might be specific to her idiosyncratic sample. This approach seems to make the classification irrelevant (Tseng et al. 2006); in other words, many of the VOLSI items for a particular factor look unrelated to each other.

1.2.2. Gu and Johnson (1996) VLS Taxonomy

Gu and Johnson (1996, 643-679) investigated 850 advanced Chinese students' uses of VLSs when learning English. They identified the following VLSs:

- Meta-cognitive regulation (e.g., selective attention);
- Cognitive strategy (Note-taking strategies guessing strategies, dictionary strategies);
- Rehearsal strategies (e.g., oral repetition)
- Encoding strategies (e.g., visual encoding, Imagery)
- Activation strategies; and
- Beliefs about vocabulary learning.

The aforementioned categories, similar to other strategy classifications systems offered elsewhere, include sub-strategies; for example, the meta-cognitive strategies, which entail selective attention and self-initiation strategies. According to the researchers, those second- or foreign-language

learners who adopt a selective attention strategy know which words help them comprehend a passage adequately. Language learners who employ a self-initiation strategy typically use several methods to clarify the meaning of target words. On the other hand, cognitive strategies such as note-taking, guessing, and the skillful use of a dictionary involve background knowledge and linguistic clues, such as identifying the grammatical structure of a sentence in order to guess the meaning of target words correctly.

In terms of memory strategies, the researchers classified these into two aspects: rehearsal and encoding strategies. The former encompasses strategies such as association, imagery, visual, auditory, and semantics, whereas the latter includes strategies such as word analysis. Moreover, they identify activation strategies, which refer to "those strategies through which learners actually use new words in different contexts, for instance, learners making sentences using the words they have just learned" (Gu and Johnson 1996, 51).

1.2.3. Nation's (2001) VLS Taxonomy

Nation (2001, 218) devised a taxonomy for L2 VLSs, which is based on three aspects of L2 vocabulary learning: (1) aspects of vocabulary knowledge, (2) sources of vocabulary knowledge, and (3) learning processes. Nation's taxonomy includes three types of strategy. These are strategies for planning vocabulary learning, strategies for finding information about words (sources), and strategies for establishing knowledge (processes).

The first class of strategies is "deciding on where to focus attention, how to focus the attention, and how often to give attention to the item" (p. 218). This class includes choosing words, choosing aspects of word knowledge to focus on, choosing strategies, and planning repetition. Choosing words implies deciding the aim of language learning, and consequently, the most effective type of vocabulary to achieve this aim. This strategy distinguishes good language learners who benefit from lists of frequent words, academic vocabulary, good dictionaries, etc. (Gu and Johnson 1996; cited in Nation 2001). As for the strategy of choosing aspects of word knowledge to focus on, Nation maintains that L2 learners usually focus on word meaning, whereas they also need to consider other aspects of word knowledge for both receptive and productive language use. Choosing strategies involves "choosing the most appropriate strategy from a range of known options and deciding how to pursue the strategy and when to switch to another strategy" (p. 219). Finally, the strategy of

planning repetition entails the use of increasingly spaced retrievals when revising previously studied word lists, word cards, old material, etc.

The second general class of strategies in Nation's taxonomy is finding information about L2 words. Nation proposed four sources as follows: (1) analyzing word parts (affixes and stems), (2) using context, (3) consulting a reference source, and (4) using parallels with other languages.

The third class of VLSs, establishing vocabulary knowledge, focuses on remembering L2 words and making them available for use. They include the following strategies: (1) noticing, (2) retrieving, and (3) generating. Noticing requires recognizing the word as an item to learn. Noticing strategies include putting new words in a vocabulary network, word lists, word cards, semantic grids, etc. Retrieving refers to recalling previously discovered words. Nation maintains that retrieving can occur across the four language skills (receptive/productive, oral/visual, overt-covert, in context/decontextualized). The difference between noticing and retrieval strategies, Nation remarks, is that the latter involves having "only a cue and the other information has to be recalled by the learner", whereas the former involves providing all the information needed by the learner. Generating strategies, in Nation's words (p. 222) include "attaching new aspects of knowledge to what is known through instantiation (visualizing examples of the word), word analysis, semantic mapping, and using scales and grids. It also includes rule-based generation by creating contexts, collocations and sentences containing the word, mnemonic strategies like the keyword technique, and meeting and using the word in new contexts across the four skills of listening, speaking, reading, and writing".

1.2.4. Schmitt's (1997) VLS Taxonomy

Schmitt's taxonomy classifies VLSs into two main types: discovery and consolidation strategies (see Figure 1.1. below). Together, the types total 58 individual strategies. According to Schmitt, his taxonomy is based on different sources, which include: (1) examining a number of reference books and textbooks, (2) asking Japanese intermediate level students to write a report about how they study English vocabulary, (3) then asking their teachers to review the preliminary list and add any other strategies they thought of, and (4) subsequent reading, introspection, and conversations with other teachers. He also indicated that his taxonomy "should not be viewed as exhaustive, but rather as a dynamic working inventory that suggests the major strategies" (p. 204). Schmitt also admits that it is difficult to devise the list and assign particular strategies to any of the main categories. It is thus possible for some strategies to belong to more

than one category. The social strategy of interacting with native speakers, for instance, can be used as a discovery strategy, a consolidation strategy, and a meta-cognitive planning strategy.

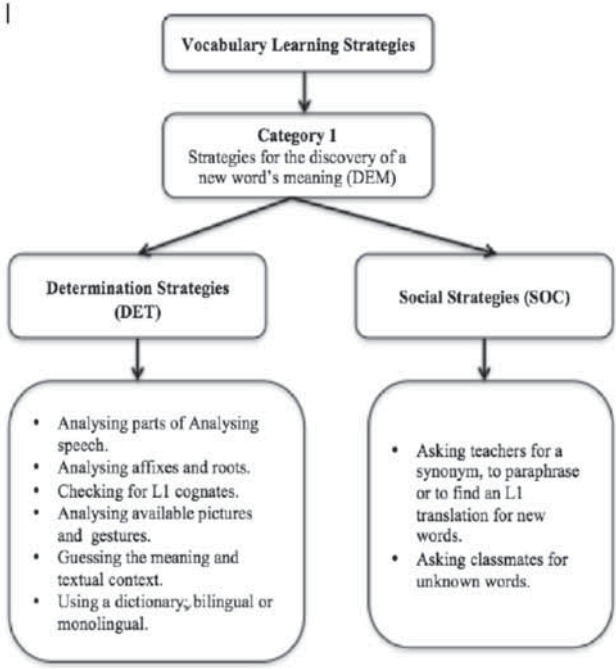


Figure 1.1. Schmitt's (1997) VLS Taxonomy – Discovery Strategies (Adopted from Alyami, 2018)

Schmitt's (1997) taxonomy of VLSs is based on Oxford's (1990) taxonomy of LLSs, which groups LLSs into social, memory, cognitive, and meta-cognitive categories (Nation 2001). Schmitt (2000), however, criticizes Oxford's taxonomy for lacking a category that adequately describes the type of strategy that a learner may use to work out the meaning of new words without seeking help from someone else. He thus introduces a category which he calls "Determination Strategies". Discovery strategies suggest that learners must discover the meanings of unknown words by different means such as "structural knowledge", "guessing" and "asking someone", which are further subcategorized into determination strategies and social strategies. The former enhances "gaining knowledge of a new word from the first four options": analysing a word's part of

speech, affixes and root, LI cognates, and global clues like pictures or guessing from context. Social strategies, on the other hand, facilitate learning through social activities such as asking a classmate or the teacher for meanings.

Consolidation strategies, the second group of strategies in Schmitt's taxonomy, deal with learners' efforts to retain the new word once it has been encountered (see Figure 1.2. below). This category includes four main sub-strategies, namely social strategies, memory strategies, cognitive strategies, and meta-cognitive strategies. Social strategies involve group work used to learn or practice vocabulary. In addition, they involve independent learning outside classrooms, such as when students enlist teachers to check their work for accuracy using flashcards or word lists. They are different from discovery social strategies in that the former covers practice and interaction using previously discovered vocabulary with others like classmates or native speakers of the target language, whereas the latter suggests asking for assistance from a classmate, for instance, for the meaning or LI translation. In other words, it can be said that discovery social strategies are prerequisites for consolidating social strategies in terms of achieving greater communicative competence.

Memory strategies involve connecting the word targeted for retention with some kind of formerly acquired knowledge (previous experiences or known words) through, for instance, imagery or grouping. This step is suggested to be necessary for the long-term retention of vocabulary. Cognitive strategies are "similar to memory strategies (Schmitt's 1997 taxonomy) but are not specifically focused on manipulative mental processing" (ibid: 215). They also include using study aids. Examples include written and verbal repetition (repeatedly writing or saying a word many times), flashcards and note-taking. Meta-cognitive strategies are used by learners to control and evaluate their learning to be more efficient. They include maximizing exposure to L2 through, for instance, English-medium books, magazines, and newspapers, skipping, and testing oneself.

In fact, Schmitt proposed the Oxford's categorization of some strategies as either memory or cognitive strategies, especially since the purpose of both categories is to aid word recall through some form of language manipulation. To solve this problem, he used Purpura's (1994) six classifications of storing and memory strategies as follows: (a) repeating, (b) using mechanical means, (c) associating, (d) linking with prior knowledge, (e) using imagery, and (f) summarizing. In his taxonomy, Schmitt considers the strategies that are most similar to types (a) and (b) as cognitive strategies because they involve a lesser amount of mental manipulation than those that are most similar to types (c), (d), and (e),

which can be categorized as memory strategies. These strategies involve either arranging mental information together or transforming it to make it more memorable.

Though Schmitt's taxonomy includes all major VLS and has been consistently used as the basis for several related studies: the strength of his study conducted solely on self-reported data for VLS frequency of use and efficiency and the subjective judgment in VLS categorization in his scheme is believed to be highly unlikely to reveal actual behaviors in vocabulary learning.

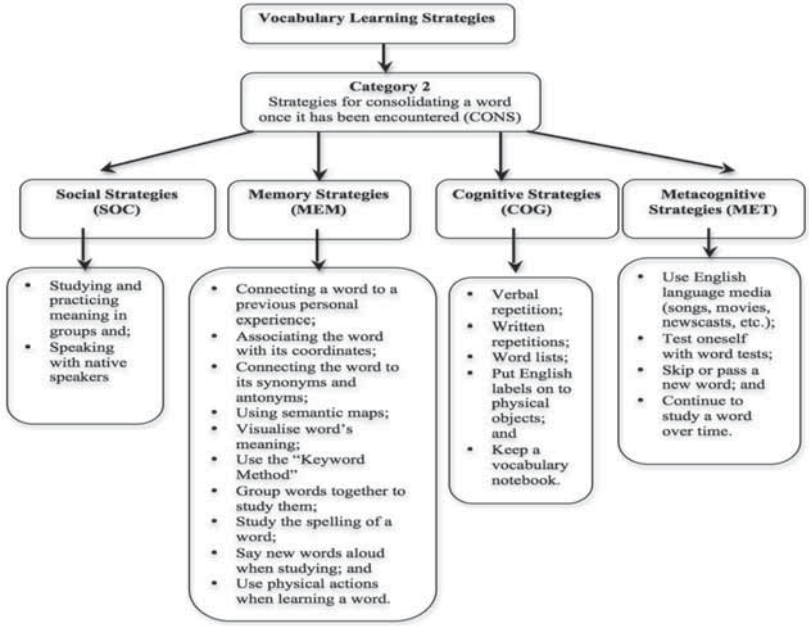


Figure 1.2. Schmitt's (1997) VLS Taxonomy – Consolidation Strategies (Adopted from Alyami, 2018)

1.3. Key Research on General L2 Vocabulary Learning Strategy Use

The focus of an overview of previous research on the general use of VLS is two-fold: (i) to briefly discuss past related empirical studies by specifically focusing on the different research methods and instruments employed by researchers to investigate L2 learners' general VLS use in a

wide variety of predominantly EFL learning contexts and (ii) to evaluate the key findings of the research and use them to afford a broader understanding of how L2 learners contend with new encounter vocabulary and the type of VLSs they employ to learn, memories, and consolidate it.

1.3.1. Ahmed (1989)

One of the most important and widely cited investigations of foreign students' VLS, Ahmed (1989), carried out a study on 300 Arab Sudanese learners of English from Khartoum. Ahmed's goal was two-fold: first, to identify the types of micro strategies and examine how these strategies are used by EFL Sudanese learners. Second, to discover if there were any differences in the strategies employed by good and poor learners in relation to various variables of which the ones in common with our study are the years of learning English and the language of investigation, English. His subjects were divided into four groups: 80 first-year students, 80 government intermediate school students, 80 high school students, and 60 private high school students; they had studied English for seven, three, five, and five years, respectively. The first three groups comprised 50 effective language learners and an equal number of less successful language learners. Subjects were assigned to these categories according to their school teachers, subjective assessments, and scholastic records. Ahmed's criteria for students categorization are, however, unsatisfactory, being unclear, and not based on standard international tests.

The strategies were studied using three research tools: a think-aloud task, an interview, and a direct observation. Ahmed was able to identify 6 macro-strategies, which will be accommodated in our instruments; VLS-Q and interview: (1) information sources, (2) dictionary use, (3) memorization, (4) practice, (5) preferred source of information, and (6) note-taking. These macro-strategies were further broken into 38 individual strategies: Examples included using a bilingual dictionary, asking others, self-testing, and written and oral repetition. Using cluster analysis, Ahmed classified the students according to their profile of strategy from his analysis. The findings distinguished the 3 different types of good learners from the 2 types of bad learners across the various education levels. The findings showed that at the macro-strategy level, there was little to distinguish between good and poor learners at different education levels. For instance, three macro 44 strategies (1, 3, and 6) were reported to be common to all learners regardless of their education level or language achievement. However, the major difference between these learners was found to lie in

the choice of particular micro-strategies adopted within these macro-strategies and the use or not of the practice category.

The good learners from different education levels identified in Ahmed's study were characterized by a number of features. These were other types of strategies used; awareness of what information about the words to be learned in terms of collocation and spelling in particular, recognition of the importance of learning words in context, exploitation of semantic relationships between new words and known words in the second language. Examples include asking others to verify one's knowledge of words, self-testing, L2 strategies such as asking for English synonyms, and the use of a monolingual dictionary. The other two groups of underachieving learners were found to demonstrate little awareness of what can be learned about new words or how to connect new words to old knowledge. Examples include their immediate resort to bilingual dictionaries. However, one positive finding about the underachieving learners' VLS was found to be their use of cooperation strategies.

Ahmed found a close link between the five clusters and the education level, suggesting that "there might be a progression in strategy use according to language learning experience" (Ahmed 1989, 11), with good learners beginning with strategies grouped in one cluster and gradually heading to another. This has implications for our study as the subjects were generated from the same educational background but at different stages of learning (first-year and fourth-year university students). This may support the hypothesis that "the higher the year of study, the more strategies are used". The years following Ahmed's study have witnessed several studies investigating VLS with different goals and employed various methodologies leading to different results. The study's findings concerning the frequency of strategy use will be cited in detail where appropriate as we examine each category of VLS and relate our study findings to those of Ahmed.

1.3.2. Schmitt (1997)

Schmitt (1997, 217-226) investigated 600 male and female Japanese EFL learners. The objectives of his study were: 1) to determine the most and least used strategies among learners, and 2) to ascertain whether the learners' strategy use reflected perceived usefulness. He also applied an early version of what became Schmitt's VLS taxonomy. The initial results showed two trends in terms of determination and consolidation strategies. For example, the strategies most often reported involved learners discovering meaning by guessing from context, using a bilingual dictionary, and asking

classmates the meaning of unknown words; meanwhile, the item least reported was checking L1 cognates. Concerning consolidation, the strategies most frequently employed were verbal and written repetition and saying the unknown words aloud, whereas the least common usages involved physical actions. Moreover, in terms of the most used vs. most useful, the findings revealed some overlap. For example, the first most frequently used strategy among all learners was using a bilingual dictionary (85%), and it was reported as the most helpful item by 95%. Furthermore, other strategies such as repetitive written, verbal repetition, saying a new word aloud, taking notes in class, and studying the spelling of words were used frequently and found to be helpful. Schmitt (1997, 220) points out that his participants (i.e., Japanese learners) showed considerable interest in studying the form of the word. He also found other strategies that were regarded as helpful but moderately used.

1.3.3. Nakamura (2000)

In a study similar to that conducted by Marin (2005), Nakamura (2000) examined 178 Japanese learners' uses of VLSs by achievement level (Y) and learning environment, i.e., whether they were ESL or EFL learners. He divided the learners into two groups; the first group comprised86 EFL senior high school learners and the other group, 92 ESL learners. The teachers of the former group, which had been learning English for three to five years, divided them based on their level of English. They were also classified according to three sequential levels, namely the upper, moderate, and lower, based on their mid-term and final tests. Meanwhile, the latter group, which had been learning English for three to six years, was subdivided into three groups according to their average scores on tests taken during the previous year.

The researcher examined his subjects' use of VLSs based on three instruments: a questionnaire, semi-structured interviews, and observations. The questionnaire used was developed based on a cautious assessment of previous studies, such as those by Ahmed (1989) and Schmitt (1995). His Japanese translated version of the questionnaire included 70 statements divided into five categories: (1) word attack strategies, (2) note-taking strategies, (3) dictionary strategies, (4) repetition strategies, and (5) memorization strategies. The aforementioned strategies were similar to the other VLSQ studies in the literature (Ahmed 1989; Schmitt 1997; Marin 2005; Al-Qahtani 2005). He also interviewed 33 students to verify the questionnaire data. His results revealed that the most frequently reported strategy was using a bilingual dictionary to determine the meaning of new

words. This was followed by guessing the meaning from context and guessing a word's affix.

1.3.4. Fan (2003)

Fan (2003) examined 1,067 first-year university subjects in Hong Kong. The research aimed to investigate the following: 1) to discover the most and least frequently used VLSs, and the most and least useful strategies; 2) to uncover any differences between learners' claims about the use and usefulness of the VLSs; 3) to identify the VLSs that were used by effective learners; and 4) to discover which VLSs are best for learning of low and high-frequency words. To achieve aims 1 and 2, the researcher employed a VLS questionnaire, using a classification system based on results reported by several previous researchers (e.g., Gu and Johnson 1996; O'Malley and Chamot 1990; Oxford 1990). She also included 56 individual strategies, divided into nine categories; guessing, dictionary, management, sources, repetition, association, grouping, analysis, and known words.

The results were similar to previous findings in the literature (e.g., Ahmed 1989; Gu and Johnson 1996; Schmitt 1997), i.e., using a dictionary is a preferred strategy. The results also showed some differences between using a strategy and its perceived usefulness. For instance, management strategies were rarely used, although they were regarded as relatively useful. However, for some strategies, a strong relationship emerged between their use and usefulness; for example, using a dictionary was a highly used and highly useful strategy.

1.3.5. Al-Fuhaid (2004)

Al-Fuhaid's (2004) study examined and evaluated the use of VLS with50 Saudi EFL university majors in their final year (7th and 8th levels). These two levels are the last of eight, each constituting a whole academic term. He classified his subjects into two groups: high proficient and less proficient according to their vocabulary and grammar knowledge. Al-Fuhaid used three research methods, namely questionnaire, interview, and think-aloud for data collection on VLS. The questionnaire, our interest, consisted of two parts. The first part required indicating the frequency of use for the strategy in question on a five Likert-scale "always", "often", "sometimes", "rarely", and "never". The second part required an evaluation of each strategy from a predefined range: "very useful", "useful", "quite useful", "not useful", and "I do not know".

The analysis of the questionnaire data demonstrated that the subjects tend to use both discovery and consolidation VLS though there was a clear preference and reliance on using mechanical or shallow VLS such as "consulting a bilingual dictionary with a frequency index of 78 points", while VLS which require elaborative a mental processing such as the association VLS, e.g., "using pictures/imaginary VLS has a frequency index of 32 points". The analysis of the students' think-aloud protocols showed that a number of subjects had weaknesses in several areas related to the word's solving-strategies and VP. For instance, a number of students were found incompetent in using the dictionary (i.e., ignoring the word's pronunciation, not reading example sentences) or guessing new vocabulary where the vast majority of guesses were not successful. The more successful learners were more successful in selecting the most suitable meanings from the dictionary. He found that successful learners exploit the dictionary more flexibly than less successful ones.

1.3.6. Marin (2005)

Marin (2005) examined 150 EFL learners to explore the relationship between their strategy use and learners' gender, vocabulary proficiency, year, and extraversion, and in terms of their use of VLSs. He collected his data using an open-ended questionnaire, interviews, and a vocabulary test. He wanted to know which strategies were employed most commonly, regardless of the variables, and proposed 78 strategies, dividing them into three main sections according to his VLS-Q. The first section focused on Determination strategies (such as guessing, dictionary skills, skipping, and social strategies). The second section was Note-Taking strategies. The third section involved memorization strategies (MEMs).

His findings revealed that the dictionary used strategy was the most commonly used by learners to check the meaning of unknown words, followed by writing down L1 translations and keeping notes about words referring to the source. Other strategies that seemed to be used very frequently by learners included guessing meaning from context, looking for opportunities to encounter new vocabulary items, repeating words silently, associating L2 words with L1 words, and writing down English definitions. In terms of note-taking, the location most commonly used by students to record their notes were textbooks and English notebooks, and no significant differences were found between these in terms of frequency of use. As mentioned earlier, one of the aims of this study is to determine the most and least frequently used strategies among learners, regardless of additional variables. In contrast, the least frequently used strategies

identified by Marin (2005) are recording words on audiotapes, and keeping notes on electronic devices, such as computers.

1.3.7. Al-Qahtani (2005)

This study is similar to that of Nakamura (2000) but larger. Here Al-Qahtani (2005) investigated the use of VLS among Saudi EFL learners at 3 different educational levels (intermediate, secondary, university). The variables under investigation were gender, educational level, and vocabulary proficiency. Here 440 students were randomly selected from the aforementioned educational level with English learning experienceof3 to 8 years across years of study. Al-Qahtani used three research methods: questionnaire, interview, and diary for data collection on VLS and used a vocabulary learning test (Nation 2001) to determine the subjects' vocabulary proficiency level.

To develop his study questionnaire Al-Qahtani (2005) conducted a preliminary study, similar to Marin's (2005) procedure, and the results were used in the main study to develop the main study instrument, the questionnaire, and the literature review on VLS. The questionnaire consisted of three main headings similar to Nakamura's (2000): (1) word attack strategies, broken up into 4 VLS aspects; guessing, appealing for assistance, use of a dictionary, and skipping, (2) note-taking strategies, and (3) memorization strategies. Regarding the questionnaire content, one may wonder if the same questionnaire was equally suitable for the learners across the educational levels, ages, and learning experience, and whether the understanding of the questionnaire items and deeper realization of the meaning of the items even if they were in their L1 and in simple wording have been reflected in their responses. For instance, the true meaning of the keyword method might not have been understood by intermediate students, which could have a bearing on their responses. The subjects of the current study, on the other hand, are English majors who have supposedly established an understanding of the proper meanings of such strategies and linguistic terms, which in turn may lead to more valid responses.

Despite the study methodological triangulation, the researcher was unable to include equal distribution of males and females across educational levels, especially at the university level where females from Year-one participated in the study with Year-three male students, which might have produced significant interactions in the results across the educational level as acknowledged by Al-Qahtani. In addition, although the study was about gender, female students did not participate in the diary

and interview, which might impact the strategy use representing just male learners. Al-Qahtani attributed such unsuccessfulness to the nature of the Saudi education system. To avoid such unsuccessfulness in the current study, arrangements will be made for a female teacher to collect data of the female subjects. In this way, we hoped to gain a valid picture of the males' and females' use of VLS.

The results of the study showed that the most used VLS includes; writing new words and their Arabic translation, asking for the Arabic meaning, and guessing from a picture if available. In contrast, the least used VLS includes; organizing new words by their meaning group, organizing new words by their difficulty, and listening to the item repeatedly. The findings also demonstrated a set of common strategies among the Saudi students, such as asking for L1 meaning, using the bilingual dictionary, looking up the unknown word's LI meaning, writing new words with their L1 meaning, and repeating the English word and its L1 (Arabic) equivalent. This result seems to recapitulate common interests of language learners (e. g., Schmitt 1997; Marin 2005).

The results revealed significantly different trends in the use of VLS across the educational levels where L2VLSs were used. For instance, mechanical or simple VLS, such as repeating the L2 word with its L1 translation, guessing from the sound, received greater use by intermediate students than by students of higher educational level and vocabulary proficiency. Conversely, university students showed a greater tendency towards using deeper processing VLS, which are usually linked to higher VP and thinking such as guessing the meaning from context, using a monolingual dictionary, and association strategies. The study also revealed a strong preference in using the dictionary category, which was reported by all students regardless of their educational level compared to other categories he examined. However, there were other situations where differences emerged. For instance, university students reported a greater use of guessing the grammatical class of new vocabulary, listening to the item repeatedly, and associating the sound of words with the sound of a familiar English word.

Gender results, on the other hand, demonstrated that female learners reported using VLS more than male learners who only outperformed them in two VLS relating to notes, which will be highlighted where appropriate in the section of results. However, it should be mentioned here that most gender results are just restricted to school subjects whereas our subjects are university ones, so we might not expect the same results.

As far as vocabulary proficiency is concerned, it accounted for few relationships with VLS, as three VLS were found with greater use by the

subjects in terms of vocabulary learning. For instance, it was found that high-proficiency learners use a monolingual dictionary more often than low-proficiency ones. From the diary actual of 16 male participants, the researcher identified two groups of learners, active and passive. The former were the students with greater use of VLS, whereas the latter were the students who reported less use of VLS. The common findings regarding note-taking strategies and mnemonic procedures reported by the students in the diaries were:

- Writing down new words when they encounter them, with their translation or with their English meaning;
- Repeating these words to memories them, orally or written several times;
- Revising them from time to time to ensure learning them and to be able to use them when needed in a conversation;
- Breaking long words into parts; Creating opportunities for practicing and using them in their daily conversation or writing (Al-Qahtani 2005, 11)

Other strategies such as the word-attack ones were not widely reported by the subjects as claimed by Al-Qahtani. It is not clear whether these strategies belonged to the `active' or `passive' groups or at least where they mainly belonged. However, we can be confident that they were mainly used by the active subjects, although Al- Qahtani did not mention that. Also, Al-Qahtani indicated that university students claimed that they did not use a diary for vocabulary learning, so they did not provide any data for the diary. This is an incomplete picture of Saudi learners' VLS with their diary method. Al-Qahtani did not report, in relation to the diary, what type of strategies were linked to vocabulary proficiency and what differences or similarities came out as a result of vocabulary proficiency or strategy use, which makes the result a little difficult for possible comparison.

1.3.8. Alyami (2011)

In a related study, Alyami (2011) investigated 169 male and female Saudi EFL majors' current use of vocabulary learning strategies (VLS) across genders, years of study (1-4) and varying degrees of vocabulary proficiency, inside and outside the classroom as well as the reasons why students choose the strategies they use. Three data collection instruments, i.e., questionnaire, structured interview, and vocabulary levels test were

used. The vocabulary learning strategy questionnaire emerged from a preliminary study in which an open questionnaire and semi-structured interview were used, including adaptation of a well-validated questionnaire. Qualitative data from the oral interviews of selected subjects were gathered to find the reasons for the students' strategy choice. Language proficiency data were obtained via vocabulary tests.

The results related to gender, the most influential variable in this study, showed that females reported using VLS more than males in guessing unknown vocabulary—they continued reading until they unlocked the meaning of the unknown word in the passage and associate the new word with their personal experience, among other things. Males reported only using the paper English-English dictionary significantly more often than females. Nevertheless, there were some strategies common to both genders, such as guessing the meaning of an unknown word from its structure, asking for the word's Arabic meaning, the use of an online dictionary, and organizing the new words randomly, among others. In relation to the year of study factor, skipping the new word without searching its meaning and looking up the word's grammatical category, among other things, were used significantly more often by fourth-year students than first-year students.

Vocabulary proficiency was found to correlate positively with strategies that require deep processing, such as guessing and monolingual dictionary use. The reasons for use or non-use of VLS found are related in various ways to the learner characteristics, the word, or the perceived nature of the strategy. In addition to the results, implications for lexical teaching and strategy training are presented alongside some suggestions for further research.

1.3.9. Alyami (2018)

In contrast to the educational context of Saudi Arabia, in one of the most recent VLS studies, Alyami (2018) attempted to examine self-reported VLS use in L2 vocabulary learning by 158 EFL students enrolled in four-year Bachelor’s programs at a university (82 English majors and 76 Computer Science majors). The study also examined changes in learners’ strategic behavior when employing VLSs over time as well as the use and evaluation of VLSs across academic fields of study; by sampling English and Computer Science majors using English as a medium of instruction. In line with Alyami (2011), an effort was made to reveal the reasons why learners choose to use certain VLSs over others.

To achieve the study's aim, a mixed-method data collection process was used. Firstly, by conducting a questionnaire survey, which includes questions about the learners' background information and sets of VLSs. The questionnaire was divided into three main categories: 1) the discovering strategies; 2) vocabulary note-taking strategies; and 3) retention and memorization strategies. The learners were asked to rate their use of and then evaluate the VLSs according to a five-point Likert scale. Semi-structured interviews were then conducted to identify the reasons for learners 'preferences for particular VLSs.

In general, the results showed that both majors relied on translation to L1 to understand new words, routinely noting down new words and their L1 meaning. Both majors showed little interest in organizing the words they recorded (e.g., organizing words in alphabetical order or on cards). Furthermore, it was found that the English majors used significantly more deep processing strategies than Computer Science majors, e.g., analyzing the structure of new words, also rating the self-reported usefulness of VLS more highly. It was found that learners generally remained consistent over time in terms of their use of VLSs.

1.4. Research on General L2 Vocabulary Learning Strategy Use in ESP Contexts

Surprisingly, similar efforts to survey general VLS use and classification in ESP contexts are strikingly scarce. The existing ones are carried out in diverse EFL/ESP learning contexts and settings that are quite distant from the Greek educational reality that presently occurs in tertiary education. Here we provide an account of two studies that focused on the investigation of VLS use by ESP learners, the one conducted by Lessard-Clouston (2008) in Canada and the other by Akbari and Tahririan (2009) in Iran as they are most closely related to the ESP learning context of our study.

1.4.1. Lessard-Clouston (2008)

Lessard-Clouston's (2008) descriptive case study conducted in a graduate school of theology in Canada is a study that focuses on the VLS types used by 5 native and 6 non-native English learners, learning technical vocabulary during the first year of their studies. Data were collected using pre- and post-Tests of Theological Language (TTL), through mid- and end-of-term interviews, and at the end of the course using an Approach to Vocabulary Learning Questionnaire. The analyses

addressed the VLS that Non-native English-speaking (NNES) and native English-speaking (NES) students use in learning the technical vocabulary of their discipline, how these VLS may be classified in relation to previous research, what types of words the participants report learning, and whether a particular approach to or strategy in technical vocabulary learning predicts success in acquisition, as reflected in scores on the TTL.

Key results with respect to VLS use indicated the following: (a) the most frequently used VLS by ESP participants were consolidation strategies, aiding them to remember and use words once they have been encountered. Taking notes in class, writing a list of vocabulary, listing words in a computer file, making index and flashcard, listening to recording or teacher, repeating the words orally and writing, quizzing, and asking others the meaning of new words were amongst the most frequently-used consolidation strategies used by participants in this study. (b) the most frequently used discovery strategies by ESP participants included the following: consultation of an English language or theological dictionary, making a mental note of the vocabulary item, or guessing its meaning from the context (in a lecture or reading). Interestingly, the use of social-discovery strategies (e.g., "ask NESs the meaning of words") was limited, while social-consolidation strategies (e.g., "asking someone to quiz myself") were reportedly used far more frequently by NES students than by NNES participants. Nevertheless, no strategy appeared to be more favored in a statistically significant way due to the small sample of the participants focused on in this study.

1.4.2. Akbari and Tahririan (2009)

In a similar study, Akbari and Tahririan (2009; 2011) attempted to identify the vocabulary learning strategies used by 137 ESP paramedical undergraduate students of Medical Sciences in Iran in learning specialized and non-specialized vocabulary. Using a mixed-method research, data on VLS use were gathered through observation, structured and semi-structured interviews, and a VLS questionnaire to identify the VLSs types most frequently used. Subsequent data analysis revealed that the major strategies used for learning specialized and non-specialized vocabulary did not differ, in general, among ESP students, with the use of bilingual dictionaries and oral and/or written repetition of new words being the most frequently used strategies as reported by the ESP students in this study.

1.5. Conclusion

Chapter 1 presented a review of studies relevant to this thesis, especially studies on the use of vocabulary learning strategies in predominantly EFL and ESP learning contexts. The review provides useful information in relation to VLS frequency of use across L2 learners of different language and vocabulary proficiency levels, year of study, gender, and personality traits in a variety of educational settings worldwide. Self-regulation, self-esteem, and learning styles are discussed separately in the following chapter as the main explanatory variables of our study that potentially affect effective VLS use in an ESP learning context.

CHAPTER 2

SELF-REGULATION, SELF-ESTEEM AND LEARNING STYLE IN L2 CONTEXTS

2.1. Introduction

Several factors have been empirically found to account for the use and choice of language learning strategies (LLS), including VLS. Oxford and Nyikos (1989), in particular, reviewed a list of fourteen factors related to strategy use, including, among other language learned; level of language learning, proficiency or course; degree of meta-cognitive awareness; sex; affective variables such as attitudes, motivation, and language learning goals; specific personality traits; overall personality type; learning style; career orientation or field of specialization; nationality; aptitude; language teaching methods; task requirement; and type of strategy training. Adopting a broader perspective, Ellis (1994), looking at the relationships between individual learner differences, situational factors, learning strategies, and learning outcomes, explains that individual learner differences (e.g., beliefs, affective states, learner factors, and learning experience) as well as situational and social factors (e.g., target language, setting, tasks performed, and sex), may influence the learner's choice of learning strategies in terms of quantity and type.

Learning strategies, in turn, may determine learning outcomes in terms of rate and level of achievement; however, learning outcomes are also expected to influence the choice or use of learning strategies. Without underestimating the significance of all these factors on the VLS use and choice, our primary intention in this study focuses on influential learner variables that have not been extensively included in previous VLS studies in ESP contexts, namely, self-regulation capacity in vocabulary learning, degree of self-esteem, as well as language learning styles. In what follows, we offer a brief review of these learner factors, attempting to acquaint themselves with related theoretical and empirical research on the roles of self-regulation, self-esteem, and learning styles in the field of SLA.

2.2. Definitions and Theories of Self-Regulation

The advent of research interest in the self and the affective dimension of teaching and learning a foreign language can potentially be traced back to humanistic contributions (e.g., Stevick 1980) that triggered a consideration of diverse psychological phenomena of language and learning. By the beginning of the 1990s, self-regulation had already become a central concept in educational psychology, with researchers in the field trying to integrate cognitive, affective, motivational, and behavioral components into theories that explain how individuals adjust their actions and goals to achieve desired results under changeable conditions (Zimmerman 1990).

As a construct, self-regulating learning (SRL) refers to the degree to which individuals are active participants in their own learning; it is a more dynamic concept than learning strategies in that the learners' "strategic efforts to manage their own achievement through specific beliefs and processes" are pivotal to their success in learning (Zimmerman and Risemberg 1997, 105). Following Dornyei (2005, 191; 2009), SRL involves the "cognitive, affective, motivational, and behavioral components that provide the individual with the capacity to adjust his or her actions and goals to achieve desired results in light of changing environment condition". Throughout the self-regulating process, learners intentionally activate, sustain, and adjust cognitions, affects, and behaviors to achieve their learning goals through the effective deployment of learning strategies (Zimmerman and Schunk 2011). Based on the self-awareness of their performance to achieve the self-set goals, learners themselves monitor their goals and strategies and control their social and physical settings, including seeking help. According to Schunk and Zimmerman (2003), the research regarding self-regulation theory is developed from five key theoretical perspectives, which are briefly outlined below. These are Operant Theory, Information Processing Theory, Developmental Theory.

2.2.1. Operant Theory

Following the environmentalist principles of B.F.Skinner and adapting his behavioral technology for personal use, operant researchers have produced one of the largest and most influential research bodies on self-regulation. Operant theorists contend that a person's self-regulatory responses must be linked methodologically to external reinforcing stimuli. Self-regulation responses are thus viewed as "inter-response control" links (Bijou and Baer 1961), which together achieve external reinforcement. Therefore, if self-reinforcement in the form of earned coffee breaks helps a

student succeed on an important test, the breaks will be continued. However, should these self-administered coffee rewards fail to improve test performance, operant theorists assume that this form of self-reinforcement will be discontinued or "extinguished" (Zimmerman and Schunk 2001). In the view of Mace, Belfiore, and Hutchinson (2001), self-reinforcers function as discriminative stimuli that guide further responding, rather than as reinforcing ends by themselves. When students self-regulate, they postpone immediate rewards in favour of alternative (and often greater) rewards (Ito and Nakamura 1998). According to operant theorists, the decision to self-regulate depends on the relative size of the immediate and delayed rewards and the time interval between them.

In this theory, self-regulation process has been analyzed and explained in four key sub-processes: self-monitoring (i.e., deliberate focus on the behavior with a consistent recording of the frequency/intensity of that behavior), self-instruction (i.e., creation or use of discriminative stimuli to lead reinforcement), self-evaluation & self-correction (i.e., requires individuals to compare some dimension of their behavior to the standard), and self-reinforcement (i.e., the process by which people arrange their behavior with reinforcement resulting in an increasing possibility of future responses). (Mace et al.1989; Mace and Kratochwill 1988). As the key factors responsible for regulating one's learning in this theory are the presence of effective models of and external contingencies for self-regulative responses, efforts are directed towards the implementation of self-regulation programs that can be taught to students in the general and special education curriculum to reduce the students' dependence on teacher-directed educational programs (Belfiore and Hornyak 1998).

2.2.2. Phenomenological Theory

Historically, phenomenology stresses the importance of perceptions of self-worth and self-identity as key processes in psychological functioning and, unlike operant theorists, considers self-awareness as an omnipresent condition in the process (Schunk and Zimmerman 1998). These perceptions were assumed to be organized into a distinctive identity or self-concept that influenced all aspects of behavioral functioning, including academic learning and achievement. Human experience was assumed to filter through a reactive self-system that could distort the incoming information either positively or negatively in accordance with one's self-concept (Zimmerman and Schunk 2001).

Within this framework, self-regulation is described as strongly dependent on the various development phases of the basic self-system, which is

strongly linked to age and adopt an active role in encouraging self-regulated learning, sustaining direct intervention on self-perception as the key to supporting open performance (Bramucci 2013). The primary source of self-regulatory motivation during learning is to be found in the intensification and self-actualization of the self-concept, while the fundamental role of the self in learning is to generate a motivation to attempt and persist in learning activities by means of a personal evaluation of the meaning and significance of learning activities on the basis of the perception of individual goals and abilities (McCombs 1986). In her revised model, McCombs (2001) subdivides the structure of the system of self into global forms and specific domains.

- The global form of the sense of self relates to the images that students have of themselves as self-learning subjects and are based on their awareness of the knowledge, skills, and abilities required to carry out a given task.
- The specific domain of the sense of self is defined as the individuals' perceptions of their own ability to manage and control their motivation and understanding, feelings and behaviors in a specific learning context. These self-perceptions determine how students self-regulate when they learn in that context. The model argues that emotional responses play a determinant role in motivation. If the individual's sense of self is negative, effects such as anxiety and reduction in motivation will result. This emotional state will express itself in impotence, avoidance, or withdrawal from learning activities and the learning environment. If the individual's sense of self is positive, on the other hand, he or she will not only demonstrate self-confidence during learning but also intrinsically high motivation. This applies to students who continue learning even when the external context does not require it.

Although less emphasis is devoted to the objective nature of the social and physical environment, as opposed to learners' subjective perception of it. Phenomenologists' suggestions (e.g., Harter 1987; Nicholls and Miller 1984) are student-centered in the sense that teachers must judge the effectiveness of their activities on the basis of students' perceptions rather than external criteria. To this end, McCombs (2001) also takes an activist role in promoting students' self-regulated learning by stressing the importance of teachers' encouragement throughout the learning process and focusing directly on the improvement of self-perception as the key to enhancing overt performance.

2.2.3. Information Processing Theory

Information processing (IP) theory grew out of efforts to develop electronic computers during the 1930s and guidance systems for weapons during World War II (Winne 1996) and has been subsequently used to describe and explain general aspects of human cognitive functioning as well as self-regulation across a wide range of endeavour. According to Winne (2001), SRL is a developable aptitude that changes incrementally with experience and instruction, which dynamically adapts how one engages with tasks and involves a recursive cycle of control and monitoring processes that are used during these four phases: perceiving tasks, setting goals and plans, enacting studying tactics, and adapting the tactics (Winnie 2011). Control is increased through the use of acquired studying tactics. Self-monitoring involves evaluating outcomes in terms of a person's standards as it provides the window of awareness on one's functioning (Winne and Perry 2000). These cognitive evaluations of matches and mismatches between a student's current outcomes and standards provide the impetus for learning. Although self-consciousness can assist in making adaptations, it occupies mental capacity, and as a result, must be limited when seeking to attain optimal performance (Winne and Alexander 2006). When performances become highly automatized, learners can self-regulate without direct awareness at a motoric level, and this frees them to self-regulate at a higher level in a hierarchy of goals and feedback loops. When motoric subgoals are linked automatically to superordinate cognitive goals, more proficient performance can be achieved.

Social and physical environments have little impact during self-regulation unless they are transformed into information that can be processed. Winne and his associates (Winne and Hadwin 2008; Winne 2011) have also included social tasks as a condition in later models due to evidence of the influence of others on the students' need to self-regulate their learning (e.g., studying next to a distracting peer) and self-recording and other methods of "off-loading" various aspects of information processing. Based on empirical evidence collected from computer-based studies that scaffold students' SRL, a computer-assisted learning system called STUDY helps students to increase or 'bootstrap' their level of self-regulation in an effort to study with specific menus designed to provide cues, feedback, and supplementary information to students as they learn new instructional (Winne and Stockley 1998).

2.2.4. Social Constructivist Theory

Following social constructivism tenets, self-regulation is viewed as a process of gaining understanding and theories about one's abilities, the essence of learning tasks, and the approach to regulate strategies and effort to achieve goals;- all these are established as a result of development and experience (Paris and Byrnes 1989). Originally influenced by Engel's conception of human labour and tool use, particularly in language, as a means of effecting change upon the world and consequently, upon the human mind, as well as by Marx's idea of consciousness as a property of the human mind that organizes and controls one's behavior (McCaslin and Hickey 2001), Lev Vygotsky's pivotal work has been considered as "one of the most powerful contributors to our understanding of the socio-cultural nature of human learning and self-regulation" (Oxford 2017, 66). His theory, although derived from his much-obscured writings, admittedly managed to provide a new perspective on the study of self-regulatory as a notion by broadening the focus of self-regulatory learning from cognitive psychology to learners' interaction with the social assistance that happened during the entire process of learning.

In Vygotsky's (1978) perspective, human psychological development is viewed as historically situated and culturally determined. As humans, we are born already immersed in an evolved society that uses conventional tools and signs. Development proceeds through the internalization of social interactions, with the fundamental social interaction being through language (Wertsch2008).This internalization promotes increasing abstraction, which moves to the level of conscious abstractions or scientific concepts through social institutions of school instruction, in which culturally developed bodies of systematized knowledge are introduced (Fox and Riconoscente 2008). Meta-cognition and self-regulation, the awareness, knowledge, and control of thoughts and behavior, move along this same developmental path, in which change proceeds via qualitative transformations toward a matured reflective awareness and deliberate control. This reflective awareness and deliberate control are exactly the internalizations of language-based social interactions with others.

For Vygotsky, self-regulation takes the form of deliberate control of one's own attention, thoughts, and actions; it is an essential characteristic of human behavior achieved by means of the social force of systems of stimuli.

> "at the higher developmental stages of nature, humans master their own behavior; they subordinate their own responses to their own control. Just as they subordinate the external forces of nature, they master personal

> behavioral processes on the basis of the natural laws of this behavior. Since the laws of stimulus–response connections are the basis of natural behavioral laws, it is impossible to control a response before controlling the stimulus. Consequently, the key to the child's control of his/her behavior lies in mastering the system of stimuli". (Vygotsky1981, 175–176)

Voluntary attention is the most basic form of self-organizing behavior; the ability to direct our mental focus toward a given situation, aspect, or task, is presupposed in all other forms of self-directed activity. The development of voluntary attention, control of thoughts, and control of actions proceed along parallel paths, all involving the internalization of language-based social interactions. The deliberate control of one's thoughts, which is paired with the capacity for reflective abstraction, also requires exposure to scientific concepts and school-based instruction and is not achieved until adolescence. "Learning to direct one's mental processes with the aid of words or signs is an integral part of the process of concept formation. The ability to regulate one's actions using auxiliary means reaches its full development only in adolescence" (Vygotsky 1986,108).

2.2.5. Social Cognitive Theory & the Cyclical Model of Self-Regulation

From a social cognitive perspective, self-regulation involves the interaction of personal, behavioural, and environmental triadic processes (Bandura 1986) and, within this context, Zimmerman (2000) defined self-regulation as self-generated thoughts, feelings, and behaviors that are planned and cyclically adapted based on performance feedback to attain self-set goals (Cleary et al. 2012). "Academic self-regulation processes include planning and managing time; attending to and concentrating on instruction; organizing, rehearsing, and coding information strategically; establishing a productive work environment; and using social resources effectively" (Schunk and Zimmerman 1997, 195).

Following Zimmerman and Risemberg (1997), the psychological dimensions of self-regulation involve motivation, strategies, self-awareness of performance outcomes, and sensitivity to environmental and social settings. Students are self-motivated to choose self-set goals and then make plans and choose strategies available to achieve the self-set goals. Based on the self-awareness of their performance to achieve the self-set goals, they monitor their goals and strategies and control their social and physical settings, including seeking help. In order to be self-regulated,

individuals need to use three important processes: self-observation (i.e., the deliberate attention to observe one's behavior), self-judgment (i.e., comparison between one's performances with that of a standard or goal), and self-reaction (i.e., the evaluative response to self-judgment) (Kanfer and Gaelick 1986). Thus, following personal observations, individuals make a judgment of their progress toward their self-set goals and, based on these judgments, alter their behaviors accordingly to attain these goals (Bandura 1986).

Zimmerman (2000) suggested three cyclical phases for the processes of self-regulation: forethought, performance or volitional control, and self-reflection (Panadero and Alonso-Tapia 2014). The forethought phase precedes actual performance and represents the processes that set the stage for action (e.g., students' motivation, self-efficacy, goal-setting, and planning). The performance phase includes processes that happen during learning, which influence attention and action (e.g., attentional control, keeping records, and monitoring). During the self-reflection phase that happens after the performance, learners respond to their efforts. Students compare information about their performance with a standard or goal and ascribe causal meaning to the results. They make a judgment about whether an unsatisfactory result is due to their limited capability or to insufficient effort. (Schunk 2012). These phases are interdependent so that changes in the forethought phase impact the performance phase, which, in turn, influence the self-reflection phase (Panadero 2017).

The forethought phase is the initial phase in which the learners approach the task, analyze it, assess their capacity to perform it with success, and set goals and plans regarding how to complete it. In this phase, the learners analyze the task characteristics by creating a first representation of how it should be performed and analyze the value of the task for them. This is how they activate their self-regulatory strategies. There are various self-regulatory variables important during the mentioned phase (see Figure 2.1. below). For example, self-efficacy beliefs, outcome expectations, task interest and value, and goal orientation (Zimmerman 2008;2013). These four variables are interrelated and interact during the self-regulatory process, especially during the forethought phase. The learners' self-regulation depends on the level and type of motivation coming from these variables and is therefore so different among learners.

Figure 2.1. Self-regulation cycle phases (Adapted from Zimmerman, 2008)

During the performance phase, the learners perform tasks and keep their concentration using appropriate learning strategies. Self-observation and self-control are two main processes during this phase. The learners self-observe successfully by self-monitoring and self-recording, and maintain their concentration by self-controlling various strategies, such as task strategies, self-instruction, imagery, time management, help-seeking.

During the self-reflection phase, learners judge their work and formulate reasons for their results. While justifying their success or failure, they experience positive or negative emotions, which influence their motivation and regulation in the future. Self-judgment is the process through which the learners assess their performance, and it includes self-evaluation and causal attribution, while self-reaction refers to the learners' emotional and cognitive reactions to their own attributions, and it includes self-satisfaction/affect and adaptive/defensive decisions (Panadero and Jarvela 2015). This phase affects learners' future planning and goals, initiating the cycle to begin again (Zumbrunn et al. 2011), and therefore self-regulated learners must continually adjust their goals and choice of strategies. This model proposes that there are 14 categories of self-regulated learning strategies. These strategies include self-evaluation, organizing and transforming, goal-setting and planning, seeking information, keeping records and self-monitoring, environmental structuring, self-

consequences, rehearsing and memorizing, seeking peer, teacher, or adult assistance, and reviewing notes, tests, or textbooks (Zimmerman and Martinez-Pons 1988).

Zimmerman's cyclical theory suggests that self-regulation is likely to advance with practice because successful self-regulators will draw on their previous learning experience to build a growing repertoire of beliefs and strategies that enhance learning (Duckworth et al. 2009). As the model covers a wide range of cognitive, behavioural, and motivational aspects of the learning process, it serves as a useful theoretical framework for a re-theorization of language learning strategies within a framework of self-regulation and the self-regulatory capacity at the turn of the century (Rose 2017; Rose and Harbon 2013; Habok and Magyar 2018b).

2.3. Self-regulation in L2 Language Learning and Strategy Use

Since Rubin (1975) started to determine the characteristics of good and successful language learners, the strategic view of language learning has gained increasing attention. Scholars began to identify, define, and classify strategies, and a large variety of trends have developed. However, lack of theoretical consensus in definitional terms over the concept of "language learning strategy" and certain methodological complexities in field research have recently prompted many researchers (e.g., Tseng et al. 2006; Dőrnyei 2005; Ellis 1994; Macaro 2006; Oxford 2016) to propose a research shift from learners' use of language learning strategies to self-regulation in language learning.

In Oxford's (2016) Strategic Self-Regulation (S2R) Model, self-regulated learning strategies have been specified as deliberate, goal-directed attempts to control and manage the foreign language learning process. She regarded these strategies as teachable actions that language learners choose from among several choices and employ to support their L2 learning purposes (e.g., constructing, adopting, storing, or using information for various purposes and/or developing their L2 proficiency and self-efficacy in the broader sense) (Oxford2011). This model, 'with its rich interdisciplinarity' (Oxford 2011, 41), is "intentionally heteroglossia, echoing the voices and vocabularies of different viewpoints, such as psychological, social-cognitive, and sociocultural" of as one 'unified, logically coherent system".

In this model, self-regulated second language learning strategies are explained as intentional, goal-directed attempts to manage and regulate efforts to learn the second language (Afflerbach et al. 2008), as broad,

teachable actions that learners select and employ for second-language learning purposes. Contrary to her previous language learning taxonomy, Oxford (2011; 2017) incorporated only three key dimensions of language learning strategy into her S2R model, including cognitive strategies that help the learner construct, transform, and apply L2 knowledge (p. 14), such as "activating knowledge: affective strategies that help learners create positive emotions and attitudes and stay motivated (p. 14), such as generating and maintaining motivation: and sociocultural-interactive (SI) strategies that help learners with communication, socio-cultural contexts, and identity (p. 14) (e.g., interacting to learn and communicate).She had six strategies in the cognitive field, two in the affective category and three in SI. All strategies are guided by meta-strategies (meta-cognitive, meta-affective, and meta-SI), which essentially serve as conductors in an orchestra as they control and manage the language learning process, as well as support and regulate the learner's needs in diverse contexts and situations as follows: paying attention, planning, obtaining and using resources, organizing, implementing plans, orchestrating strategy use, monitoring, and evaluating. The idea of meta-strategies reflects the multidimensional reality of the second language learner since they help the learner know whether and how to develop a given strategy and aid in determining whether the strategy is working as intended. Strategies and meta-strategies in the model are quite dynamic and respond to changing needs of the learner for different purposes in various socio-cultural contexts.

Doing a task or solving a problem is described alongside Zimmerman's (2000) three-phase of self-regulation process; it entails strategic forethought, strategic performance, and strategic reflection and evaluation, which suggest when some learning strategies or meta-strategies are likely to be useful. However, the phases are not always linear or strategically distinct because learners can use them in different order, and because some strategies can appear in multiple phases. In its current form, the model proposes two basic assumptions with respect to the language learning process: (i) almost everyone can learn an additional language effectively using appropriate strategies, displaying a certain degree of self-regulation in the process, and assuming some basic interest and sufficient time in learning it and (ii) that strategies can be learned through mediation or assistance since the learning is assumed to be assisted performance. Clearly, introducing the notion of meta-strategic regulation, Oxford expanded Flavell's (1979) cognitive monitoring model and successfully incorporated self-regulation into her theory (Oxford, 2011). This together, with the fact that she expanded the domain of strategies control in both the

affective and SI fields could, in fact, be considered the most important outcomes of her S2R theory (Habok and Magyar 2018a).

Assuming that self-regulated strategies relate to language learning strategies, Dornyei (2005) also suggested that involving self-regulation in the language learning process would lead to a broader understanding of the notion than definitions of LLS. With this change, emphasis has been placed on the process rather than the product, while self-regulation was considered to form the basis for a more dynamic model of strategic learner behavior that could be explained and further studied through his five-category taxonomy of motivational control strategies (Dorney 2005, 113):

- Commitment control strategies for helping to preserve or increase the learners' original goal commitment (e.g., keeping in mind favorable expectations or positive incentives and rewards; focusing on what would happen if the original intention failed).
- Metacognitive control strategies for monitoring and controlling concentration, and for curtailing unnecessary procrastination (e.g., identifying recurring distractions and developing defensive routines; focusing on the first steps to take in a course of action).
- Satiation control strategies for eliminating boredom and adding extra attraction or interest to the task (e.g., adding a twist to the task; using one's fantasy to liven up the task).
- Emotion control strategies for managing disruptive emotional states or moods, and for generating emotions that are conducive to implementing one's intentions (e.g., self-encouragement; using relaxation and meditation techniques).
- Environmental control strategies for eliminating negative environmental influences and exploiting positive ones by making the environment an ally in the pursuit of a difficult goal (e.g., eliminating distractions; asking friends to help one not to allow to do something).

Working in collaboration with Tseng and Schmitt (Tseng et al 2006), Dornyei proceeded to the creation of a questionnaire designed to measure students' self-regulatory capacity in the process of vocabulary learning with validation results that "provided empirical confirmation of the soundness of this system" (Dörnyei 2005, 112). Subsequent research led by Tseng and Schmitt (2008) also resulted in the development of their structural model (see Figure 2.2. below) that integrated vocabulary knowledge, motivation, and six latent variables, i.e., initial appraisal of the vocabulary learning experience, the self-regulating capacity of vocabulary

learning, strategic vocabulary learning involvement, mastery of vocabulary learning tactics, vocabulary knowledge, and post appraisal of the effectiveness of vocabulary learning tactics as a basis for further understanding of self-regulatory vocabulary learning in L2 contexts.

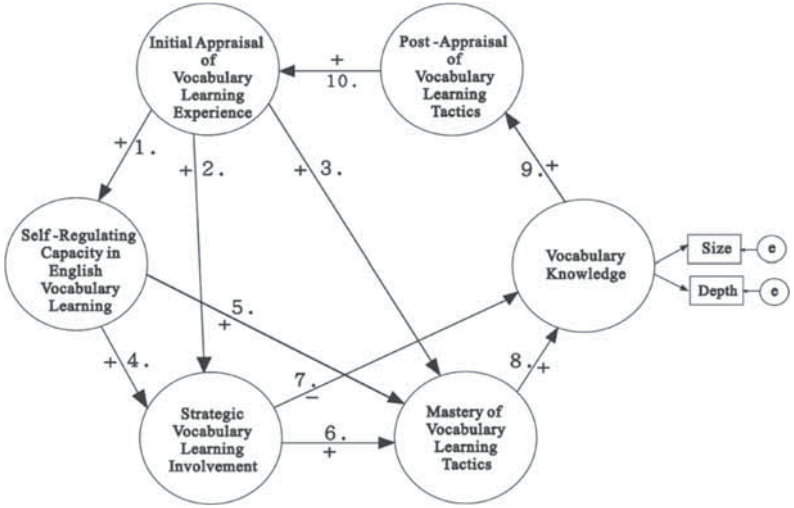


Figure 2.2. The hypothesized model of Self-Regulating Capacity in Vocabulary Learning with six latent variables (Tseng & Schmitt, 2008)

According to the model, the process of vocabulary learning is cyclical in nature, starting with an initial appraisal of the vocabulary learning experience (i.e., an initial motivational level of vocabulary learning), indicated by value, interest, or effort that affects learners' self-regulation capacity in vocabulary learning, and, in turn, drives the use of vocabulary strategies (Schmitt 2010). The next is strategic behavior, separated into two components, i.e., strategic vocabulary learning involvement, referring to a quantity dimension of strategy use and regards covert or overt acts to reveal or improve the effectiveness of specific tactics including the overall vocabulary learning involvement as well as the attempts made to achieve it; and mastery of vocabulary learning tactics, referring to the quality dimension of strategy use and concerns with mastering specific covert or overt learning methods to learn vocabulary (Vujnovic 2017). Vocabulary knowledge operationalises depth of knowledge as a combination of three factors: knowledge of the different possible meanings of a word

(polysemy), knowledge of its collocational constraints, and knowledge of its spelling (Tseng and Schmitt 2008).

Improvements in vocabulary size and depth are hypothesized to be directly affected by vocabulary learners' retrospection of task performance (Tseng and Schmitt 2008). Consequently, learners will, depending on the outcome of vocabulary learning, critically evaluate the whole process, "have positive or negative reactions to the performance outcome, and make attributions for the performance outcome" (Pintrich 2000). Post appraisals of vocabulary learning tactics are assumed to influence future vocabulary learning, with this phase signifying the period of self-reflection of task processes after the task is finished (Tseng and Schmitt 2008). To Dornyei, this phase is very important as "a critical retrospection contributes significantly to accumulated experience, and allows the learner to elaborate his or her internal standards and the repertoire of action-specific strategies" (2001, Tseng and Schmitt 2008, 368). Hence, not only does the initial motivational state affect the processes of task performance, but also a retrospection of task performance affects this state in a cyclical manner (Tseng and Schmitt 2008). Learners who are aware that they have achieved the learning goal and make proper attributions for their success are more likely to sustain their high self-efficacy, positive attitude, and emotional climate for the following task performance in a cyclical manner (Dornyei 2001; Pintrich and Schunk 2002).

Despite its usefulness, as one of the first research instruments to operationalise the construct of self-regulation in the field of L2 vocabulary and SLA generally, it has been subjected to heavy criticism as its classification is based solely on the underlying self-regulatory capacity of the learner, rather than the strategy use itself, and "thus failing to re-conceptualize strategic learning in the face of self-regulation is like "throwing the language learning strategies out with the bathwater" (Rose 2012: 95).Following Grenfell and Macaro (2007, 26), "Dörnyei may be setting up a straw man to knock him down". Failing to provide a more fine-grained association in his model between strategy use and specific tasks was questioned by several researchers in the field (e.g., Hsiao and Oxford 2002; Macaro 2001). Nevertheless, as is in the case of Oxford's (2011; 2017) Strategic Self-Regulation Model (S^2R) above, the concept of self-regulation continues to infiltrate into language learning strategy research in both empirical and theoretical terms with new models emerging in both empirical and theoretical terms. Towards this direction, Lin and Oxford's (2009) self-regulation was originally motivated by empirical research on strategic learning based on micro and macro perspectives in the framework of psychological and socio-cultural theories. In a similar vein, Weinstein

(2009) developed a model of strategic learning in the framework of learners' skill, learners' will or motivation, and self-regulation, while Rose's model (2012, 97) "merges elements of cognitive and memory strategies from SLA and language cognition theory with motivation control and self-regulation theory". Notable is also the number of research instruments (Salehi and Jafari 2015; De la Fuente et al. 2015) and consequent empirical adaptation and validation studies (Ziegler 2015; Mitzumoto and Takeuchi 2012) that ensued to survey the range and quality of self-regulated language and vocabulary learning strategies in recent years.

2.4. Related Research on Self-regulation and L2 Vocabulary Learning

Rigorous systematic reviews (e.g., Rose et al. 2018) on the topic of self-regulation has shown a proliferation of methodologically different empirical studies in language learning often yielding positive correlations between self-regulation strategies, successful language learning in general (Seker 2016; Bown 2009), and effective development of specific language learning skills such as writing knowledge, writing quality, writing approach, and motivation (e.g., Lam 2015; Farsani et al. 2014), as well as speaking and listening skills (Onoda 2014). Interestingly, the limited empirical study of self-regulation in the area of vocabulary learning strategy has often yielded mixed and highly inconsistent results. Conducted within the Iranian context and using a correlational design study, Zarei and Hatami (2012) attempted to explore the relationship between self-regulated learning components, vocabulary knowledge, and reading comprehension among 250 college students majoring in TEFL, English Language Translation and English Literature who were administered in a 60-item vocabulary and reading comprehension TOEFL test along with a Persian version of the 32-item Self-Regulation Trait Questionnaire. Analyses via the Pearson correlation procedure revealed various results yielding (i) no significant relationship between any of the self-regulated components of their respective questionnaire (i.e., planning, self-check, effort, and self-efficacy) and the vocabulary knowledge of the participants and (ii) mixed results with respect to the relationship between reading comprehension and self-regulated learning components, which was only found to correlate significantly with self-check and effort in a positive way.

Within the same educational context of Iran, Fatemipour and Najafgholikhan (2015) attempted to investigate the impact of self-regulated strategy development (SRSD) on the vocabulary learning of60

intermediate EFL students and explore the relationship between male and female participants with regard to the effect of SRSD on their vocabulary learning using a quasi-experimental research design. To achieve their goal, learners (30 male and 30 female) were randomly assigned to two groups of 30, a control group who received the mainstream instruction for intermediate learners and an experimental group who received additional training using self-regulated strategy development in their vocabulary instruction. The treatment consisted of five vocabulary learning strategies (using a monolingual dictionary, new words in sentences, guessing meaning from the context, word part analysis, and repetition), which were reinforced through five steps of SRSD: discuss it, model it, make it your own, support it, and independent performance. The results indicated that self-regulated strategy development can have a significantly positive impact on the vocabulary learning of Iranian intermediate EFL learners, and this impact does not differ by gender. Based on the findings of the study, it was suggested that self-regulated strategy development is particularly useful when learning vocabulary in English language classes. This finding seems contrary to Ma Ping and Shiraj's (2012) study that addresses the issue of 38 pre-university Chinese EFL learners studying at the University of Malaysia by focusing on strategy use, motivational beliefs, and self-efficacy. Both quantitative and qualitative methods elicit data via (a) an adapted language learning strategy questionnaire from Gu and Johnson (1996) and (b) a structured interview, conducted to investigate aspects of self-regulation in a vocabulary learning. Findings indicated that cognitive deep processing strategies and meta-cognitive strategies (self-regulation processes) are rarely applied by the learners, thus exhibiting a limited self-efficacy (i.e., self-evaluation of their progress in EFL vocabulary learning process) as a result of complete lack of strategy knowledge on the part of the learners.

Using the self-regulation capacity in vocabulary learning scale (SRCVoc) developed by Tseng et al. (2006), Mizumoto (2013) investigated the effects of integrating a self-regulated learning approach on self-efficacy in vocabulary learning with 115 EFL Japanese university students. His participants were assigned to a treatment group, which received the intended self-regulatory intervention, and two comparison/control groups and responded to items of a self-efficacy in vocabulary learning questionnaire three times and a vocabulary test twice. The results of the study confirmed a steady increase in the self-efficacy beliefs and vocabulary knowledge of the group that benefited from the self-regulatory instruction, which was believed, in the long run, may help the learners become independent and autonomous in their vocabulary learning. SRCVoc was also one of the

main research instruments used by Amirian et al. (2015) in investigating the relationship between Iranian EFL undergraduate students' self-regulation capacity for vocabulary learning and their vocabulary size majoring in English language and literature. Data analysis revealed no significant relationship between these two variables. However, multiple regressions indicated that the meta-cognitive control compared to the other subscales made a better contribution to the prediction of learners' vocabulary size, with first-year undergraduate students having a higher mean score in their self-regulation capacity, possibly attributed to the strategies learnt in their Study Skills courses.

Age-related differences in self-regulated vocabulary learning strategies were observed by Hardi (2014) in a study with 400 young learners in Hungary using various L2 vocabulary learning strategies, who were conscious of their endeavour while learning the words, and used self-motivational and self-regulatory strategies efficiently. Relying on quantitative and qualitative data collection methods, based on interviews and questionnaires complemented by the results of classroom observations, the researcher attempted to tap into the learners' own perceptions of their learning processes, outlining young learners' self-regulated vocabulary learning behavior in the L2 English classroom. The results showed that young learners use various vocabulary learning strategies, are conscious of their endeavour while learning the words, and make appropriate and efficient use of self-motivational and self-regulatory strategies. As for age-related differences, the youngest, is surprisingly, the most strategic in vocabulary learning, indicating that self-regulation in vocabulary learning has been developed by the age of 8-9; the oldest among the primary school learners is the second most strategic, implying that although there is a certain change in self-regulated vocabulary learning, it does not show a linear development in the strongest sense and requires further explanation.

Given the review of the limited relevant work undertaken on self-regulation in L2 vocabulary learning, researchers have attempted to explore its role and determine its impact on EFL learners' L2 vocabulary knowledge and size using different methodological designs and measurement instruments. Clearly, such efforts are justified on the face of the definitional fuzziness surrounding self-regulation as a notion within the SLA area and further reflects L2 scholars' need and concern to delimit and effectively operationalise self-regulation in empirical terms allowing a thorough understanding of its expediency in vocabulary and language learning acquisition in general. Self-regulation is one of the major learner-related factors examined in our study in relation to its effect on our ESP learners' use of vocabulary learning strategies. Being the only study of its

kind in Greece, we decided to use a Greek version of the vocabulary learning scale (SRCVoc) developed by Tseng et al. (2006) to measure our subjects' current self-regulation capacity and, subsequently, investigate its effect on ESP learners' vocabulary learning strategies validly and reliably.

2.5. Definition and Typology of Self-Esteem

Self-esteem is one of the affective factors whose role in learning a foreign language cannot be disregarded, although it is not fully understood, and as a term, it is sometimes used synonymously with the notions of self-concept, self-confidence, self-appraisal, or self-image, all carrying slightly different meanings and represent varying levels of specificity (Mercer 2008). The plethora of unsuccessful attempts to define these constructs is seen throughout the literature because they are based on the differentiation of elements that are very difficult, if not impossible to separate, such as feelings (emotion) and thoughts (cognition) (Rubio 2014; 2007). In fact, following Schumman's (1994, 231) neuroscientific research confirms that "cognition and affect are distinct but inseparable" and "…from a neural perspective, not only are various affective processes interrelated, but affect and cognition are also intimately intertwined" (Schumann 1997, 238).

Since knowledge of self entails understanding the mental and emotional processes, needs, strengths, and limitations (Araluce 2002) and "functions as an important platform for the regulation of thought, emotion, action, and interpersonal reactions" (Nowak et al. in Dörnyei 2009, 212) throughout the language learning process, Arnold (1999) divided affective factors into two major categories (Table 2.1. below), i.e., those associated with the language learner as an individual, self-esteem and learning styles, being two of them and those associated with the language learner as a participant in socio-cultural situations and interaction with others (e.g., in a language classrooms):

(1) connected with the language learner as an individual:	(2) connected with the language learner as a participant in socio-cultural situations, involved in interaction, related to others:
• anxiety—"associated with the feeling of uneasiness, self-doubt, apprehension or worry''	• empathy—trying to understand and feel what another person understands or feels
• inhibition—a set of defenses built to protect the ego	• classroom transaction—"the process of reaching beyond the self to others''
• extroversion-introversion—a need to receive self-esteem, a sense of wholeness and ego boost from other people or from the reflection of the self	• cross-cultural processes—understanding what is appropriate or inappropriate in L2 communication
• motivation—the inner drive to pursue a course of action	
• learner styles —predispositions toward processing information in a specific way	
• self-esteem — the sense of self-worth.	

Table 2.1. Arnold's Typology of Affective Factors (1999) (Adopted from Habrat 2013)

Looking from a historical perspective, one may discern varied approaches towards the concept of self-esteem, and varied claims about the antecedents and consequences of high or low self-esteem for an individual from a purely psychological point of view (Table 2.2. below). Following the psychoanalytic approach, James (1890) initially defined self-esteem as a type of behavior, namely, action (i.e., "competence" that involves exercising one's abilities and skills effectively) that results in success noting, at the same time, that self-esteem also involves "pretensions", which today are better understood as aspirations, including one's desires, goals, hopes, and dreams (Mruk 2013a: 20). Thus, the work on self-esteem that stems from this definition tends to focus on particular forms of success, namely those related to an individual's identity. White's (1959; 1963) work is probably the most articulate psychodynamic expression of self-esteem, explicitly based on competence. Contrary to homeostatic theories of motivation, according to which, people become motivated when a need is not met because it disturbs homeostasis,

generating a negative tension or distress, White (1959, 318) asserted that "it is necessary to make competence a motivational concept; there is a *competence motivation* as well as competence in its more familiar sense of achieved capacity". Satisfying this need through the mastery of developmental tasks and experiencing other successes in childhood result in feelings of "effectance" and a sense of self-respect. In White's (1963) words, "self-esteem . . . has its taproot in the experience of efficacy" (p. 134).

Researcher	**Approach**	**Characteristic Features of Self-esteem**
James 1890	Psychoanalytic	An affective phenomenon, dynamic, subject to change, depends on successes and failures, open to enhancement.
White 1963	Psychodynamic	A developmental phenomenon, determined by own accomplishments (internally) and the affirmation of others, affecting behavior, affected by experience.
Rosenberg 1965	Sociocultural	A product of influences of culture, society, family, interpersonal relationships.
Coopersmith 1967	Behavioural	An acquired trait, an expression of worthiness, influenced by parents and others, linked to anxiety and depression.
Branden 1968	Humanistic, philosophical	A basic human need defined by the sense of worthiness and competence, low level has serious consequences (suicidal attempts, depression, anxiety), dynamic in nature.
Lau et al 1999	Cognitive	A basic human need, consequence of one's understanding of the world and others and one's relation to them, hierarchical in nature: global, intermediate, situational.

Table 2.2. Major contributors to the concept of Self-esteem (Adopted by Habrat 2013)

Morris Rosenberg (1979) introduced another way of defining self-esteem that led to the development of the next major school in the field (socio-cultural psychology). This definition is the most commonly used

today. He defined it in terms of a particular type of attitude, supposedly based on the perception of a feeling about one's "worth", which is to say one's character or value as a person. In this sense, Coopersmith (1967) also considers self-esteem as an egocentric personality factor which means the worth that people place on themselves, defining it as the evaluation which the individual makes and customarily maintains to himself; it expresses an attitude of approval or disapproval and indicates the extent to which an individual believes himself to be capable, significant, successful, and worth. The distinguishing characteristic of defining self-esteem in Rosenberg's (1965) way is that it is seen primarily as affective in nature: In this case, self-esteem is based on a particular feeling, one of being worthy or, most commonly, worthiness. This emphasis on evaluative mental processes and affective experience, rather than on behavior and its outcomes, means that self-esteem can be seen in terms of the psychology of attitude formation. Hence,

> Self-esteem, as noted, is a positive or negative attitude toward a particular object, namely, the self. . . . High self-esteem, as reflected in our scale items, expresses the feeling that one is "good enough." The individual simply feels that he is a person of worth; he respects himself for what he is, but he does not stand in awe of himself, nor does he expect others to stand in awe of him. (Rosenberg 1965, 30–31)

Rosenberg's definition may seem to suggest that self-esteem plays something of a passive role in behavior, being the result of something else, namely, a process of evaluation that contrasts cognitive psychologists' where self-esteem is viewed as a function of individual worth and a much more active and dynamic process (Epstein 2006) that plays an active, even central, role in the self. Rosenberg later presented self-esteem as a hierarchical construct (Lau et al. 1999) that can be analyzed at three levels of specificities: (i) global (general self-worth, global perception of self as a person), (ii) intermediate (specific to certain domains, for example, academic competence, often referred to as academic self-concept), and (iii) situational (everyday manifestations of self-esteem, self-evaluations of behavior in specific situations – Brown's (2000) "task self-esteem") (Mruk1999). Finally, Nathaniel Branden (1969), using a reconciliatory two-factor approach, defines self-esteem in terms of a relationship between competence and worth or worthiness:

> Self-esteem has two interrelated aspects: it entails a sense of personal efficacy and a sense of personal worth. It is the integrated sum of self-confidence and self-respect. It is the conviction that one is *competent* to live and *worthy* of living (Branden 1969:110).

According to Branden's definition, it seems that humans have a fundamental need to feel worthy but can only achieve that goal by acting competently when making decisions, especially those that involve facing the challenges of living. As we are faced with making decisions so often in life, and since there are no guaranteed outcomes, self-esteem may be seen as a precious psychological resource that can be won or lost when seen from this point of view. If so, self-esteem is an attitude that needs to be carefully managed at all times (Branden 2001).

Finally, a phenomenological perspective has proposed that self-esteem is the result of the evaluation of competence and worthiness under a complex process of interaction between the world and perceived experiences (Mruk 2006). The result of the interaction can be placed in a matrix that accounts for positive and negative behaviors (self-centered, narcissistic, negativistic, depressed, overachieving, antisocial, etc.). All individuals evaluate their self-concept according to their perceived worthiness and competence, and the emergent self-esteem can be conceptualised along a set of axes. An individual's self-esteem can be thought of as resulting from the combination of a high or low sense of worthiness and competence, leading to these four established: (i) high worthiness and high competence leading to high or authentic self-esteem, (ii) low worthiness and low competence leading to low self-esteem, which provokes negative behavior, (iii) low worthiness and high competence leading to defensive behaviors in the form of overachieving performance, and (iv) high worthiness and low competence resulting in self-centered behavior.

In the SLA realm, Richards and Schmidt (2002, 475) define self-esteem as "a person's judgment of their own worth or value, based on a feeling of "efficacy", a sense of interacting effectively with one's environment". In an effort to differentiate between self-esteem and self-concept, Dorneyi (2005, 211) defines self-esteem as the process and resulting evaluation of self-concept. The term itself is conceptually self-describing, i.e., to esteem means to regard, value, appreciate, or consider something. Thus, a person can have high or low self-esteem and not a high or low self-concept because self-esteem is the resulting evaluation of the perceived self-concept. Finally, the two key components evaluated in the perception of one's self-concept are one's sense of competence and one's sense of worthiness: the first is related to self-efficacy (beliefs about one's abilities, aptitude, intelligence, etc.) and the second to self-worth (beliefs and feelings about the worthiness of being looked at, accepted, etc.; physical image and personality would play a major role here). Equally, Rubio (2014, 44) describes "self-esteem as a process of evaluation and the emergent evaluation, while self-concept is the perceived entity that is

evaluated". Self-esteem would correspond to the resulting evaluation of the picture, which would be the self-concept. Therefore, self-esteem is the process of evaluation, and self-concept is the entity evaluated according to the particular vision or view of that entity.

2.5.1. The Problem of Operationalizing Self-esteem for SLA Research Purposes

The developmentally dynamic and multidimensional nature of self-esteem is a phenomenon of either global or situational nature. That people tend to live at a certain level of self-esteem most of the time but fluctuate in certain situations is often mentioned as one of the primary reasons inhibiting its proper instrumentation in research terms (Mruk 2008). In fact, self-esteem has often been considered as the evaluative component of self-concept, and alongside self-confidence, self-concept stability, and self-crystallization form the complex notion of self-concept (Pajares and Schunk 2002; Schunk and Pajares 2009). Additional evidence from the area of education (Marsh 1993; Marsh et al. 2006) in favour of that self-esteem exists in specific domains rather than as a single, global entity comes from relevant research about the effect of education on the children's development of self-concept, highlighting the intersection between the two concepts in academic contexts. In their 1976 multi-level model of academic self-concept, Shavelson, Hubner, and Stanton attributed academic self-esteem a prominent place within global self-esteem, recognizing that self-esteem may be further narrowed into specific areas of study (maths, English, science, etc). The non-academic branch of the model is further extended to facets of social life, emotional life, and other self-concepts, noting that children are likely to base their self-esteem on these estimations as on their social relationships, physical abilities, and appearance.

On the other hand, self-esteem is also related to self-confidence (i.e., the extent to which one believes one can produce results, accomplish goals, or perform tasks competently (analogous to self-efficacy). The belief that one is capable of performing a task can raise self-esteem, and thus, a high self-esteem might lead one to attempt difficult tasks, and subsequently, the success may enhance self-confidence (Schunk 1995). According to Anderson and Bourke (2000), self-esteem, locus of control, and self-efficacy are closely related phenomena; however, self-efficacy is more directed at specific tasks for subjects. It refers to how capable the learner feels of succeeding in a particular task(s). It is characterized as "I can" versus "I can't" (p. 35). Anderson and Bourke (2000, 67) further

postulate that it is a response learned over a long period through the learner‘s multiple experiences of positive and negative outcomes. “...the more a student experiences failure in relation to a type of task, the more likely it is that they will become convinced of not being able to succeed”. The student develops a condition known as “learned helplessness”. These feelings have a massive boost or vice versa on individuals’ motivation drives.

While from a theoretical point of view, the overlap of self-esteem with the notions of self-concept and self-confidence reflects Mercer’s (2014,142; 2011b; 2011c) view of self as “a complex dynamic system… composed of multiple interrelated components…[and]…being in a state of flux”, leading to various types of dynamics, the inextricably blurry nature of self-esteem seems to pose serious obstacles to the construction of a valid and reliable research measurement tool for use in SLA and language learning strategy research. Given the prominence attached to the notion of self-esteem in the field of educational psychology (Heatherton and Wyland 2003; Scheffand Fearon 2004), a number of self-esteem instruments, mainly quantitative in nature, have variously been used, measuring, unfortunately, very different constructs as reflected by the correlations between these scales ranging from zero to 0.8, with an average of 0.4 (Donellan et al. 2011). In a careful examination of numerous measures of self-esteem, Blascovich and Tomaka’s (1991) measures of self-esteem led them to conclude that no perfect measure exists and they recommended a revision of the Janis–Field-scale as one of the better measures of self-esteem. They noted, however, that the Rosenberg scale is the most widely used in research. Next, wedescribe both measures as well as the State Self-Esteem scale.

Revised Janis–Field Feelings of Inadequacy

The original Janis–Field Feelings of Inadequacy scale (JFS) was a 23-item test developed in 1959 for use in attitude change research (Janis & Field 1959). This multidimensional scale measures self-regard, academic abilities, social confidence, and appearance (Fleming and Watts 1980). The split-half reliability estimate by Janis and Field was 0.83, and the reliability was 0.91. The items from the JFS have been modified severally (e.g., Fleming and Courtney 1984), such as changing the format of the responses (5- or 7-point scales, etc.) or adding questions for other dimensions of self-esteem, such as academic ability (Fleming and Watts 1980). A thorough review by Blascovich and Tomaka (1991) identified the

JFS as one of the best for use with adults and selected the Fleming and Courtney (1984) version as one of the best measures to use.

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem scale (Rosenberg 1965) is the most widely used measure of global self-esteem (Demo 1985) and the one adopted by most studies addressing self-esteem as a variable in L2 language learning research. Originally, it was used to assess the self-esteem of 5024 high school juniors and seniors from randomly selected schools in New York State. It takes a form of a 10-item Likert-type items scale (subjects read statements that they are supposed to respond to by marking one from five options from "strongly agree" to "strongly disagree") with high internal reliability (alpha 0.92), easy to administer and interpret. The high test—retest reliability and high internal consistency account for its popularity. A potential problem of RSE is that the questions in it can be easily divided into "positive" and "negative" ones, making the measure liable to the social desirability effect (Heatherton and Wyland 2003). Unfortunately, those questions that were worded in a negative direction loaded on the "negative" factor, and those that were worded in a positive manner loaded most heavily on the "positive" factor, thereby suggesting a response set (Gray-Little et al 1997). Because both factors correlated almost identically with a criterion variable (in strength, direction, and consistency); however, they seem to be tapping the same general construct.

Coopersmith Self-Esteem Inventory (SEI)

It was first developed for use with children and later adapted for adults (Ryden 1978). It was first used on eighty-seven 5th and 6thgrade boys and girls and after several weeks with a sample of 1748 children from public schools of central Connecticut (Coopersmith, 1967). It correlates highly with the Rosenberg Self-Esteem Scale and Janis-Field Feelings of Inadequacy Scale (Janis & Field 1959). The scale is meant to measure self-regard in four specific domains: peers, parents, school, and personal interests. Participants have to respond to questions (reduced by Coopersmith in 1975 from the original number of 50 to 25) by choosing one of two options: "like me" or "unlike me".

State Self-Esteem Scale

The State Self-Esteem scale (Heatherton and Polivy 1991) is a commonly used measure that is sensitive to laboratory manipulations of self-esteem. The SSES consists of 20 items that tap momentary fluctuations in self-esteem. The scale has acceptable internal consistency (alpha = 0.92) and is responsive to temporary changes in self-evaluation (Crocker, Cornwell, and Major 1993). Confirmatory factor analysis reveals that the SSES consists of three factors: performance, social, and appearance self-esteem (Boozy and Heatherton 1994). The SSES is labeled "current thoughts" to minimize experimental demands. Measures of trait and state of self-esteem are highly correlated, and therefore in neutral settings, scores on the SSES are highly related to trait measures. The decision to use a trait or state measure of self-esteem, therefore, depends on whether one is interested in predicting long-term outcomes or in the immediate effects associated with feelings about the self.

If such proliferation of poorly validated scales has posed significant challenges for psychologists and educationalists alike in their effort to estimate the consequences of self-esteem on behavior, thought, and emotion, the sheer paucity of relevant scales in L2 language learning is even more pronounced. Except for Hassan's (2001) Foreign Language Self-esteem scale (FLSES) formed to assess university EFL learners' self-esteem in an oral communicative ability task within an Arabic learning context, most of the other studies addressing self-esteem as an explanatory variable in L2 studies (see 2.5.2. below) tend to opt for the use the Rosenberg Self-esteem Scale described above. As this scale refers to L2 learning contexts, we thought it appropriate to use the FLSES scale (for a description see section 3.5.2.) in our current study as a means to measure our ESP learners' self-esteem in relation to their VLS use.

2.5.2. Self-esteem and Second Language Learning

The relationship between self-esteem and its various behavioral outcomes, including learning achievement, has been well researched and documented in the literature (Saebi 2011; Chen, Yeh, Hwang, and Lin 2013; Pepi, Faria, and Alesi 2006) with mixed results regarding the effects ofself-esteem, learning achievement and the potential intermediary role of learners' sense of worthiness. By contrast, the study of self-esteem in Foreign language Learning (FLL) primarily related to L2 achievement in all four main language skills is scare with only a few focusing on L2 language strategy use, although several facets of the language learning

process are, beyond any doubt, related to the construct (Yazdanmehr 2011). As affective factors such as self-perception impact all essential components of the language learning process in the form of attitudes accounting for the investment of effort (McCroskey et al. in Rubio 2007), further research on the topic of self-esteem becomes imperative to decipher its role in the L2 classroom.

Following Williams et al (2016, 53), understanding and exploring the self-system in general, i.e., 'our perception of who we believe or feel we are also lies at the core of our ability to self-regulate, which includes how we monitor and evaluate our own behavior as [L2 learners] and select appropriate strategies to help us learn and use language'. As such an awareness about ourselves is crucial to how we learn and is linked to our unique capacities as humans to reflect on ourselves and our experiences and use this knowledge to guide our subsequent behavior and future goals (Mercer 2011b; 2012), it becomes a desirable goal for teachers to promote this feeling of competence and empowerment in learners. Relevant research (Mruk 2008; 2013b) on the topic of self-esteem in foreign language performance has, in fact, foregrounded the differential effects of learners' self-esteem on academic achievement, positive attitudes and well-being within the environment of L2 classroom. In this respect, L2 learners with good self-esteem are usually able to communicate feelings and emotions in different situations, approach new situations with confidence and positivity, appear capable of influencing others' opinions or behaviors in a positive way, communicate positive feelings about themselves, accept responsibility, keep situations (positive and negative) in proper perspective, and possess an internal locus of control in that they develop beliefs that whatever happens to them is the result of their own behavior and action (Arnold in Rubio 2007; Lavoie 2007).

By contrast, students with low self-esteem are characterized as withdrawn/shy, insecure and underachieving, have negative attitudes, unhappy, angry/hostile, unmotivated, depressed, dependent/follower, exhibit a poor self-image, non-risk-taker, lack self-confidence, and demonstrate poor communication skills. They typically exhibit learned helplessness, practice perfectionism, communicate self-pejorative statements, overly dependent on their teachers and peers, demonstrate an extreme need for acceptance (a great desire to please an authority figure such as the teacher), have difficulty making decisions, exhibit low frustration tolerance, become easily defensive, and do not volunteer to do learning tasks (Guindon 2002).

The first studies relating language learning to self-concept and self-esteem are indirectly from research on motivation. Clément's linguistic L2

self-confidence (1986) construct was incorporated into a vast number of studies relating to motivation and a variable under the umbrella of the *willingness to communicate* (WTC) phenomenon (e.g., Fonseca Mora and Toscano Fuentes 2007), or *communicative apprehension* (Richmond and McCroskey 1989), commonly known as fear associated with communicating with another individual. More recent research, however, has focused on the relationship of self-esteem with other phenomena (e.g., anxiety) (Zare and Riasati 2012; Ortega 2007) and on academic performance in specific language domains or skills and offer practical suggestions for classroom practice. For example, Heyde (in Nogueras 1996) studied the impact of three levels of self-esteem (global, situational, and task) on oral production of French by 181 American college students who were asked to evaluate their worthiness in situations when they had to use L2. Task self-esteem was measured using errors and comparisons tasks, while both types of task self-esteem were examined before and after the participants performed the tasks. The researcher found that all the three levels correlated significantly with oral performance measures with the highest correlation between task and oral production, a fact confirmed by Maryansyah and Wadison's (2017) study in Indonesia, where the majority of EFL undergraduate students were found to possess task self-esteem at 67% while performing speaking tasks in English.

In a similar vein, Koosha, Ketabi, and Kassaian (2011) studied the relation between the constructs but split their assessment of speaking skills into several aspects such as vocabulary, structure, pronunciation, fluency, and comprehensibility, which were tested using Fahrady's scale (Fahrady 2005 in Koosha et al. 2011), while self-esteem was measured on Sorensen's scale. Interestingly, the strongest correlation was found between self-esteem and fluency, while the other aspects of speaking proficiency remained insignificantly correlated. The authors conclude that students with higher levels of self-esteem are more sociable, more risk-taking, and more eager to exchange their views with others without being preoccupied with whether what they produce is lexically or grammatically accurate. In a related study in Iran, Kalanzadeh et al. (2013) found a statistically significant correlation between students' overall self–esteem and their verbal performance, proving that willingness to communicate (WTC) depends largely on how positively the learner evaluates themselves.

Addressing the extent to which 'writing apprehension and self-esteem of 132 EFL university students are related to both quality and quantity of their writing in an Arabic speaking context, Hassan (2001) conducted a study using primarily quantitative data derived through an English Writing Apprehension Questionnaire, a 40-minute writing task on the following

topic: 'My Teaching Practice Experience in the Preparatory Schools' and a 25-item Likert type Foreign Language Self-esteem Scale (FLSES) based partly upon previous psychological self-esteem scales proposed by Coopersmith (1967) and Heyde-Parsons (1983). FLSES items are statements to which students respond on a five-point Likert scale, ranging from strong agreement to strong disagreement and includes four sections, i.e., learner's self-esteem with respect to his/her (i) language ability, (ii) actual in-class language use, (iii) in-class relationships, and (iv) attitude toward/behavior in the FL class. The same questionnaire was also adopted and accordingly adapted for the purposes of our study, as it is one of the very few questionnaires, if not the only one, that attempts to measure L2 learners' self-esteem and determine its influence with respect to their writing skills in a foreign language. Based on Pearson product-moment correlations, t-tests, and two-way analyses of variance, it was found that writing apprehension of EFL Egyptian university students negatively correlated with their self-esteem and L2 learners' writing quality, indicating that low apprehensive students had higher self-esteem than high apprehensive students and wrote better quality compositions than their high apprehensive counterparts. According to the researcher, the reported results point to a shift in instruction of L2 writing classes at the university level from traditional teacher-centered methods towards the adoption of peer or self-evaluation as a means to lower L2 learners' anxiety levels to help them produce better quality writing in a secure and non-threatening L2 class environment.

A significant, positive correlation between self-esteem and achievement in writing in L2 was also found by Al-Hattab (2006). The study comprised global, specific, and task self-esteem measurement, administered to randomly selected, third-year secondary students from two public schools in Saudi Arabia. Data were collected through a Questionnaire of Self-Esteem in English Writing for Third Year Secondary Students, designed by the researcher measuring global, specific, and task self-esteem while the skill of writing in L2 was measured by an English Writing Achievement Test, also constructed by the researcher. Interestingly, only specific and task self-esteem were significantly correlated with writing attainment; the correlation between global construct and writing was non-significant. Although the study sample was small (N = 81), the results echo the claims made by Sanchez and Roda (2003) that domain-specific self-esteem is more substantially correlated with achievement in the corresponding area than global self-esteem.

A similar question about the relationship between a specific foreign language skill and learners' self-views was posed by Kartal (2011), who

took into consideration attitudes towards L2 reading and their possible link with specific self-esteem among 230 English, French, and German foreign language teacher trainees in a Turkish university. The measured instrument was a questionnaire, which contained items relating to reading attitudes, specific self-esteem (self-concept), and other constructs, such as anxiety or comfort. The results showed a significant positive correlation between attitudes towards reading and specific self-esteem, while the subjects from the French and German departments had scores, which were not significant. Likewise, a positive correlation was found between self-esteem with listening comprehension (Hayati and Ostadian 2008) for 80 selected Iranian university students attending courses in English. The researchers explained that students expect to succeed consistently with their self-esteem, i.e., high self-esteem ones predict higher levels of achievement while low self-esteem individuals expect to fail.

In the Korean EFL context, Basco and Han (2016) investigated the level of self-esteem, motivation, and anxiety of university English learners and their differences according to gender, year, and English proficiency level. They found that the students had a moderate level of self-esteem, motivation, and anxiety, while a positive correlation was found between self-esteem and motivation and a strong negative correlation between self-esteem and anxiety. Significant differences among learners were found in terms of their level of self-esteem, motivation, and anxiety when grouped according to gender and English proficiency level, but no significant difference existed when grouped according to the year of study. Similarly, in Piechurska-Kuciel's (2012) study, low-esteem learners tend to feel anxious, with a debilitative effect, when asked to perform in front of others (communication apprehension), in testing situations (test anxiety) or when evaluated by the instructor and the classmates (fear of negative evaluation).

Investigating the relationship between self-esteem and proficiency level in the EFL classroom, Soureshjani and Naseri (2011) found a strong positive relationship between the two factors. Pramita (2012) also examined the possible contribution of self-esteem to the students' English proficiency for second-year students of SMA Nigeria 7 Denpasar. The results showed again, a positive and significant relationship between self-esteem and English proficiency and corroborated by findings of similar studies in diverse educational contexts such as in Saudi Arabia (Alrabai 2017), Turkey (Tifarlioglu 2014), and China (Liu, 2012). By contrast, self-esteem was not found to be statistically correlated with language fluency (IELTS) and general academic achievement (GPA) among 200 male and female students in Abu Dhabi University in Dev and Qiqieh's (2016) study.

Interestingly, self-related research has been expanded to L2 language learning strategies where a small number of related studies yield specific results considering the effect of self-esteem on language learning strategy use with obvious pedagogical implications for L2 learners and educators alike. Investigating the relationship between global self-esteem and language learning strategy use among 127 college-level EFL learners, Asadifard and Biria (2013) used the Rosenberg Self-Esteem Scale (1965) and Oxford's Strategy Inventory for Language Learning for data collection to determine the relationship between total GSE and total LLSs as well as the six categories of learning strategies, separately via correlational analyses and t-tests to compare self-esteem means scores of high and low strategy users as well as across genders. The strongest positive correlation was found between cognitive and compensation strategies and self-esteem, while the weakest existed between the affective strategies and self-esteem. Gender was not found to be a determinant factor for being a high or low strategy user and did not affect self-esteem. The researchers concluded that learners who value themselves more favourably tend to rely primarily on their mental capabilities while learning and that improving learners' self-regard and their language learning strategies may have a mutual boosting effect on FL achievement.

In a similar study, Ahour and Hassanzadeh (2015) empirically investigate the possible relationship between 136 Iranian intermediate EFL learners' self-esteem, their use of indirect strategies (meta-cognitive, affective, and social), and their foreign oral language proficiency by administering a subsection of Oxford's strategy inventory including the 21 items concerning the indirect strategies along with Sorenson self-esteem test for data collection purposes. An oral language test (TOEIC test) was also administered to assess the participants' oral language proficiency. The findings revealed a statistically significant relationship between Iranian intermediate EFL learners' self-esteem, their use of indirect strategies, and oral language proficiency, implying that L2 learners with a high degree of self-esteem, believe in their abilities, perceive themselves to be efficient and try hard to execute very competently while speaking in the foreign language, and tend to be more successful in using indirect strategies. Equally, Hasemian (2012) in his study on the interplay between self-esteem, level of English proficiency, and language learning strategy use among 120 Iranians L2 learners in a language school found two strong and positive relationships between L2 learners' self-esteem and their success in employing effective LLSs and their proficiency level, indicating that the higher the proficiency levels of L2 learners, the higher their degree of self-esteem and vice versa. However, MR analysis revealed that of the L2

independent variables of the study (i.e., self-esteem and L2 proficiency level), it was the L2 participants' proficiency level that better accounted for their use of LSs.

Clearly, the studies reported above testify that the issue of self-esteem is meaningful in the context of FL performance. Aside from the plethora of definitions of the construct and the associated inherent difficulties in its operationalization for research purposes, relevant research on self-esteem in L2 contexts associate high self-esteem with confidence in oral production in L2 tasks, particularly the fluency aspect (Koosha et al. 2011;Niki Malekiand Mohammadi 2009), as well as with high performance in L2 writing (Badran 2001) and listening (Hayati and Ostadian 2008) and reading comprehension tasks (Bagheri and Faghih 2012; Kartal 2011) and eventually with more efficient use of language learning strategies (Asadifard et al. 2013; Ahour et al. 2015). Given the relative scarcity of research into self-esteem issues in SLA, particularly in the field of vocabulary learning strategy, we feel a need to expand the understanding of the matter for the sake of optimizing the effects of the onerous task that L2 vocabulary language learning so frequently seems to be. For this reason, self-esteem is included in our study in an effort to explore its effect on VLS use by ESP learners and determine its interrelationship with the other independent variables (i.e., self-regulation capacity and learning styles) under consideration here.

2.6. Overview and Definitions of Learning Styles

Over the past fifty years, individual differences (IDs) and the various ways by which learners acquire and process new information have attracted considerable attention in numerous fields, such as first and second language acquisition, education, and psychology (Ellis 2008). Dornyei (2005) pointed out that IDs have been consistently shown to correlate strongly with L2 achievement that no other SLA variable can match defining them broadly as “enduring personal characteristics that are assumed to apply to everybody and on which people differ by degree”. Among the ones most commonly highlighted and discussed in a number of related research are age (Larsen- Freeman and Long 1991), attitude (Light own and Spade 2013), motivation (Crookes and Schmidt 1991; Larsen-Freeman 2000), and learning styles that reflect differences in the ways individuals prefer to perceive, process, and acquire information (e.g., Oxford 2003; Peacock 2001; Reid 1995). Following Kinchella (1995, 171), learning style “appears to be influenced by both nature and nurture; it is a biological and developmental set of characteristics” suggesting that

factors such as upbringing experiences and the environment play a significant role in shaping the individuals' learning styles.

Learning styles have been defined in several ways, indicating little agreement among scholars on their precise nature. To this end, Herman, Leaver, and Oxford (2003) caution that although terms such as *learning styles*, *cognitive styles*, and *personality types* have different meanings, they are often used interchangeably, confusing their distinction. In fact, a substantial number of empirical studies tend to "refer to learning styles, others to learning approach and learning orientation … [where]… the same construct is described in different terms and the same term can be used to refer to quite different constructs" (Healey et al. 2005, 31). Nevertheless, a seeming straightforward and intuitively convincing manner to define learning styles would be to describe them as "an individual's natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills" (Reid 1995) while, Brown (2000, 113), yet more simply, defines them as "consistent and rather enduring tendencies or preferences within an individual". Equally, Kinchella (1995, 171) describes learning style as "an individual's natural, habitual, and preferred way of absorbing, processing, and retaining new information and skills" while Fleming (2001, 1) views learning styles as "an individual's characteristics and preferred ways of gathering, organizing, and thinking about information".

Yet, in the enormous task of learning a second language, the most prominent and frequently cited definition of learning styles is the one provided by Keefe (1979, 2) as:

> … characteristic cognitive, affective and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment … learning style is a consistent way of functioning, that reflects underlying causes of behaviors.

Learning styles, therefore, encompass four aspects of the person: (i) cognitive styles, i.e., preferred or habitual patterns of mental functioning, (ii) patterns of attitudes and interests that affect what an individual will pay most attention to in a learning situation; (iii) a tendency to seek situations compatible with one's own learning patterns; and (iv) use certain learning strategies and avoid others (e.g., Dunn, Dunn and Perrin 1994; Felder 1993; Oxford et al. 1991). The above definitions are especially significant to SLA research, as they provide shape and direction to future research. Nevertheless, for the purposes of the present study, we adopt Oxford's (2001, 361) definition of learning styles as "general approaches –for example, global or analytic, auditory or visual –that

students use in acquiring a new language or in learning any other subject". They are "the overall patterns that give general direction to learning behavior" as opposed to learning strategies that are described as "specific actions, behaviors, steps, or techniques" used to carry out language tasks in specific learning situations. Drawing a line of differentiation between learning styles and strategies, she further succinctly explains their equal contribution of each in terms of a useful toolkit leading to "active, conscious, and purposeful self-regulation of learning, when the learner consciously chooses strategies that fit his or her learning style and the L2 task at hand" (Oxford 2003,2). To this end, it would be interesting to explore the extent to which learning styles, as unintentional or spontaneous traits that characterize L2 learners (Nunan 2010), can influence the use of specific L2 vocabulary strategies to facilitate L2 vocabulary learning in an ESP context.

Over 20 styles dimensions have been identified by different researchers as utilized by language learners and believed to influence L2 language learning (Herman and Oxford 1990; Oxford and Levine 1992). Willing (1988), for example, proposed a model for language learning style dimensions classifying styles according to different phases of language learning into perceiving, processing, and using. In the first phase, the perceiving phase, learners receive language input through all their senses and, therefore, learners involve kinesthetic, visual, auditory, or tactile sensory preferences in learning a language. Personality style was also included at this stage (involved-observing, identity secure and identity anxious, and self-directing and authority-oriented) as a factor that determine show information is searched, collected, and processed. The second phase, the processing phase, is defined as "the phase of what happens inside the head" (Willing 1988, 61) and includes cognitive style (analytical tendency and concrete tendency) and acquired learning styles (selective focusing, hypothesis testing, utilizing contextual clues, and imaging). In the last phase, the using phase, learners retrieve information learned in the previous stages and use this information whenever needed (Willing 1988).

Reid (1995) proposed another classification for language learning styles by dividing them into three major categories: cognitive learning styles, sensory learning styles, and personality learning styles. First, cognitive learning styles involve field-independent learners who usually learn more effectively by analyzing facts sequentially, separating details from the general background, and proceeding to broad and general ideas (Reid 1995). Field-dependent learners, on the other hand, prefer to learn "in context, holistically, intuitively, and, especially, sensitive to human

relationships and interactions" (Reid, 1995, ix). Under cognitive learning styles, Reid further classified learners as either analytical or global learners. Analytical learners are detail-oriented and prefer to learn individually and step-by-step in order to achieve their goals, while global learners view a holistic picture and learn more through communication with other individuals and from concrete experiences (Reid, 1995). In addition, the cognitive learning styles classification offered by Reid (1995) distinguishes between reflective learners, accurate learners who are more effective when given time, and responsive learners, fluent learners who prefer to respond immediately.

The second category in Reid's (1995) classification of language learning styles includes sensory learning styles. He further divided the sensory learning styles into two dimensions: perceptual learning styles (auditory, visual, tactile, kinesthetic) and environmental learning styles (physical and sociological). In perceptual learning styles, auditory learners depend mostly on their listening and speaking abilities and learn more effectively by listening to instructions, directions, and oral interactions without the need for visual aids. Visuals learners, on the other hand, learn more effectively through their eyes (seeing). Visually-oriented learners prefer to read, draw, study charts, and use visual cues and graphic information when learning a second language (Reid 1995). Some learners may fall into the tactile group and those who prefer to learn through touch and hands-on activities while other students are described as kinesthetic learners (i.e., they enjoy whole-body movement and physical actions for learning a language such as miming and role-play), according to Lightbown & Spada (2013). The environmental learning style, according to Reid (1995), subsumes physical learners who are more comfortable in the learning environment when such variables as sound, light, temperature, time, and a classroom's arrangement are suitable. Sociological learners are sensitive to variables such as group, individual, pair and teamwork, and the teacher's role and level of authority in the classroom. Reid (1995) includes the two social styles (group and individual) along with the sensory learning styles (auditory, visual, tactile, and kinesthetic) to form the Perceptual Learning Style Preferences Questionnaire (PLSPQ).

The third category of learning styles is the affective or temperament learning style, which subsumes three dimensions: temperament styles, tolerance of ambiguity styles and right-and left hemisphere learners. Reid (1990) adopted the Myers-Briggs temperament styles (Myers and McCaulley 1985) to distinguish between four dimensions of learning styles: extraversion and introversion; sensing and intuition; thinking and feeling; and judging and perceiving. Tolerance of ambiguity is another

style proposed by Reid (1995) and refers to the degree to which learners are willing to tolerate ambiguity usually associated with learning a new language. Ambiguity-tolerant learners prefer to practice, communicate, and take the risk to learn a new language, while ambiguity-intolerant learners feel more comfortable with less flexible, less risky, and more structured situations (Reid 1995). Left- and right-brain learners may tend to employ different styles in language learning (Reid 1998). Left-brain-dominant learners favour visual, analytic, and reflective learning, while right-brained learners tend to use auditory, global, impulsive and interactive learning (Brown, 2000). Similarly, Oxford (2001) also discusses four dimensions of learning style that are likely to be among those most strongly associated with L2 learning, all incorporated in her Style Analysis Survey (SAS): (i) sensory preferences including visual, auditory, kinesthetic (movement-oriented), and tactile (touch-oriented), (ii) personality types extraverted vs. introverted; intuitive-random vs. sensing-sequential; thinking vs. feeling; and closure-oriented/judging vs. open/perceiving, (iii) desired degree of generality include the global-holistic dichotomy, and (iv) biological differences, where differences in L2 learning styles attributed to biological factors, such as biorhythms, sustenance, and location are also mentioned.

Admittedly, due to the disparity in how researchers categorize, define, and group learning styles, a number of researchers state that the study of learning styles is both complicated and, at times, divided. Cassidy (2004, 420) notes that "to some extent, this can be considered a natural consequence of extensive empirical investigation and is to be expected with any continually developing concept, which proves useful in gaining understanding of such a crucial and prevailing endeavour as learning". He further attributes the construct's ambiguity to the fact that research in learning styles is no longer limited to the domain of psychology and is even reflected in SLA via a proliferation of the most influential or popular learning-style models, typologies, and learning style instruments.

2.6.1. Learning styles Models and Instruments

Given its prominence as a key pedagogical issue, researchers both in general education and in the SLA field have persistently tried to approach the concept of learning styles by proposing a variety of methods to identify the style preferences of individual learners. A brief overview of related comprehensive critical reports of several learning style models and instruments (Hadfield 2006; Smith 2005) offers a detailed description of the most well-known and widely available learning style scales revealing,

at the same time, critical issues of construct validity, predictive validity, internal consistency and test-retest reliability associated with them (Cesur and Fer 2009; DeCapua and Wintergerst 2005).

With the exception of Reid's (1984) validation of Perceptual Learning Style Preference Questionnaire (PLSPQ) with high intermediate and advanced L2 learners of English (see above 2.5.5.), most of the rest learning styles inventories, discussed in this section, have been severely criticized both for the various levels of their reliability and their validity (e.g., Dunn and Dunn's learning styles inventories, Gregorc's Style Delineator (GSD), Jackson's Learning Styles Profiler (LSP), Kolb's Learning Style Inventory (LSI), and Riding's Cognitive Styles Analysis (CSA), Myers-Briggs Type Indicator (MBTI), O'Brien's Learning Channel Preference Checklist, Oxford's Style Analysis Survey and Cohen's et al., Learning Style Survey), that minimize their potential in identifying learners' learning styles and suggesting the most appropriate pedagogical interventions. As some of them have variously been used in SLA research in the identification of L2 learners' learning styles in various educational contexts (e.g., Andreou et al. 2008; El-Hmoudova et al. 2015), we shortly review them.

Kolb Experiential Learning Theory & Learning Style Inventory (LSI)

Kolb Experiential Learning Theory (Kolb 1984, 26) is an experiential model which defines learning as "the process whereby knowledge is created through the transformation of experience". Learning is presented as a holistic set of continuous processes, with a lesser emphasis on outcomes and learning styles are the 'generalized differences in learning orientation based on the degree to which people emphasize the four modes of the learning process. The model asserts a four-mode or four-process learning cycle that covers and generally starts with Concrete Experience (CE), moving to Reflective Observation (RO), then to Abstract Conceptualization (AC), and finally to Active Experimentation (AE), with the most effective and complete learning taking place when learning activities embrace all four modes. However, depending on the individual's preferences, learning may start at any one of the other modes in the cycle. Kolb describes CE and AC as bipolar on a continuum and orthogonal to a second bipolar continuum of RO and AE. Individual learning styles result from a combination of two adjacent mode preferences in the experiential learning cycle leading to four basic learning styles: Diverger (CE and RO), Assimilator (RO and AC), Converger (AC and AE), and Accommodator

(AE and CE). Individuals have a preference for one of the four learning styles but can and should learn to use the other modes.

The Kolb Learning Style Inventory (LSI) is a commercially available questionnaire with twelve items where respondents rank-order four-sentence endings that correspond to the four learning modes. Scores are between 13 and 48, and students and faculty can self-administer, self-score, and self-interpret the LSI. While Kolb (1984) found moderate support for the validity of his instrument, there has been extensive and ongoing research on the validity and reliability of the instrument (e.g., Manolis et al. 2013; Henson and Hwang 2002), resulting in major revisions to the instrument.

Felder–Silverman Learning/Teaching Style Model

The Felder–Silverman Learning/Teaching Style Model (1988), originating in the engineering sciences, defines learning style as 'the characteristic strengths and preferences in the ways individuals take in and process information' (Felder and Silverman 1988, 674). It asserts that individuals have preferences along five bipolar continua: the Active-Reflective, the Sensing-Intuitive, the Verbal-Visual, the Sequential-Global, and the Intuitive-Deductive; The Index of Learning Styles (ILS) is a free, 44-item questionnaire that asks the respondent to choose one of two endings to a sentence that focuses on some aspect of learning. Scoring is 1, 3, 5, 7, 9, and 11, with 1 and 3 showing a balance along the continuum, 5 and 7 showing a moderate preference for one end of the continuum, and 9 and 11 a strong preference for one end or the other. It provides metrics for all but the Intuitive-Deductive dimension, with scores showing the strength of an individual's preference for the indicated continuum (Coffield 2004). Individual students have relative preferences along each of the four but can learn to function in the other direction. The researchers also discuss a number of teaching approaches useful to match the learning preferences that emerge from the use of the ILS.

Dunn and Dunn Learning Style Model

In the Dunn and Dunn Learning Style Model, preferences are measured by the Productivity Environmental Preference Survey or PEPS (Dunn and Dunn 2004; 1989). Dunn (1990, 353) defines learning style as "the way in which individuals begin to concentrate on, process, internalize, and retain new and difficult information". Dunn and Dunn suggest that there are learning style stimuli and several elements within each stimulus -

Environmental (sound, light, temperature, and room design), Emotional (motivation, persistence, responsibility, and structure), Sociological (learning alone, in a pair, with peers, with a teacher, and mixed), physiological (perceptual, intake while learning, chronological energy pattern, and mobility needs), and Psychological Processing (global or analytic, hemisphericity, and impulsive or reflective) (Vaseghi et al. 2012). Dunn and Dunn's PEPS is a commercially available questionnaire that offers a set of 100 questions covering all five stimuli and their respective elements. Scores range from 20 to 80, with 40 to 60 reflecting a low or balanced preference for the two ends of each of the 20 elements, and 20 to 40 or 60 to 80 reflecting a stronger preference for the indicated polar end. Students and faculty can self-administer, self-score, and self-interpret the PEPS if purchased online.

The VARK Learning Styles Model

The third model is the VARK Model (Fleming 2001), a sensory model that is an extension of the earlier neuro-linguistic model (Eicher 1987) and, whose acronym stands for Visual (V), Aural (A), Read/Write (R), and Kinesthetic (K). Fleming (2001,1) defines learning style as "an individual's characteristics and preferred ways of gathering, organizing, and thinking about information. VARK is in the category of instructional preference because it deals with perceptual modes and focuses on the different ways that we take in and give out information". The only perceptual modes or senses, it does not address are taste and smell. The VARK Inventory provides metrics in each of the four perceptual modes, with individuals having preferences for anywhere from one to all four. Individual students have relative preferences along each of the four perceptual modes but can learn to function in the other modes. Fleming (2001) reports that about 41% of the population who have taken the instrument online have single style preferences, 27% two preferences, 9% three, and 21% have a preference for all four styles. The free VARK questionnaire offers thirteen statements that describe a situation and asks the respondent to pick one or more of three or four actions that the respondent would take. Each action corresponds with a VARK Learning Style preference. The total of all four scores ranges from 13 to 48, with individuals having a preference for one, two, three, or all four of the learning channels.

Cohen, Oxford and Chi's (2001) Learning Style Survey (LSS) Model

Learning Style Survey (LSS) was initially developed by Cohen, Oxford, and Chi (2001) and considered to be an improved version of Oxford's (1993) Styles Analysis Survey (SAS) as the researchers increased its quality in two significant ways; first, by adding several dimensions and, second, by extending its scope and application on language-related subjects. The instrument contains 11 dimensions, 23 subscales, and 110 items, and its rating scale has been changed from a 4-point format to a 5-point Likert-type format to allow researchers to add global and particular dimensions. The LSS incorporates many learning style models with brief statements.

In this sense, the first dimension is composed of visual, auditory, and tactile learning styles, similar to Reid's (1995) PLSPQ physical senses dimension. On the other hand, LSS's random sequential dimension is based on Gregorc's (1982) study on learning experiences and their designs, while its global-particular dimension is based on Riding and Cheema's (1991) model for learning styles. The synthesizing-analytic dimension originated from Guilford's (1967), who studied on thinking styles and learning style taxonomy of problem-solving strategies. LSS's sharpener-leveler dimension is based on Holzman and Gardner's (1960) taxonomy, investigating how knowledge is assimilated in the memory, and the field-dependent and field-independent dimension comes from Witkin, Moore, Goodenough, and Cox's (1977) research about the influence of environmental motives on individual perception and performance. Finally, the impulsive-reflective dimension is from the model about speed of conceptualization by Kagan, Roman, Day, Albert, and Phillips (1964). Taking into account the limited use of Cohen's et al. (2001), LSS in relation to studies concerning L2 language and vocabulary learning both in Greece and abroad, we used it as an instrument to measure ESP learners' learning styles in this present study, and examine the effect these styles might exercise on VLS use in the process of L2 technical vocabulary at the university level.

2.6.2. The role of Learning Styles in L2 Language Learning Strategy Use

To date, a few rigorous studies have examined the possible relationships between learning styles and language learning strategies as "in reality, it is difficult to determine just how much weight style preferences will have in learners' selection of strategies for a given task" (Cohen 2003, 281) due to

intervening factors such as age, gender, and level of proficiency that may be influential. Viewed from another perspective, Ehrman, Leaver, and Oxford (2003) believe that learning styles and learning strategies are interwoven and manifested in one's behaviour and actions and as such, it is helpful for learners to recognize these learning styles, know their strengths, and thus develop their learning potentials. Oxford (1993b,146) argues that when learners are conscious of their own learning styles, it enables them to adjust their learning strategies to match diverse learning tasks in special contexts. In other words, "learners can take advantage of their learning styles by matching learning strategies with their styles; similarly, learners can compensate for the disadvantages of their learning styles to balance their learning by adjusting learning strategies". A number of empirical studies suggested that learning styles may significantly influence learners' learning strategy choices despite the different research instruments and contexts concerned (e.g., Carson and Longhini 2002; Ehrman and Oxford 1990; Littlemore 2001).

In a qualitative study of 20 Foreign Service Institute (FSI) students, Ehrman and Oxford (1995) explored the relationship between learning styles and learning strategies through semi-structured interviews. Before the qualitative study, the subjects had already completed two self-reported instruments as part of the quantitative study: the MBTI-G (Myers and McCaulley 1985) for learning styles and the Strategy Inventory for Language Learning (SILL) (Oxford 1990b) for preferred language learning strategies. It was revealed that for each contrasting pair of the bipolar MBTI scales, the preferred learning strategy categories were in an approximately matched distribution. For Thinking-Feeling, the complementarity was nearly complete. The research findings indicated that learners' learning styles may significantly influence their choices of language learning strategies. In a similar study, Carson and Longhini (2002) investigated the relationship between language learning styles and strategies of the diarist/researcher in a naturalistic setting utilizing Oxford's SILL and the Style Analysis Survey (SAS) to compare categories that emerge in the diary entries. The analysis indicated that the diarist's learning strategies were often affected by her learning styles. For example, the diarist, with a global learning style, always suspended bits or partly understood language until they formed a large pattern. The diarist was also aware of the difficulty of utilizing strategies not preferred by her styles. For example, the diarist was introverted and often felt uneasy when communicating with people she did not know well. Littlemore (2001) focused on different communication strategy preferences (CSs) relating them to the holistic/analytic cognitive style dimension. 82 Belgian

university students who were native speakers of French and had been studying English for one year at the university participated in the study. A French version of Riding's (1991) computer-based Cognitive Styles Analysis (CSA) was used to measure participants' holistic/analytic cognitive styles, and the concrete picture description task based on Poulisse's test was devised to assess their CSs. The research results showed that the participants used considerably more conceptual CSs than linguistic CSs. Within the domain of conceptual CSs, holistic participants were significantly more likely than analytic participants to use holistic CSs, and analytic participants were significantly more likely than holistic participants to use analytic CSs.

Chen (2006) in a study with 390 Taiwanese junior high school students indicated that a positive relationship existed between learning style preferences and language learning strategy use. In other words, students who had obtained high scores in learning style preferences gained high scores in language learning strategies. Similarly, Hsu and Chen (2016) showed that active, reflective, and balanced types of learners affect choice in social, memory, and meta-cognitive strategies, while Sahragard and Abbasian (2016) demonstrated that learning styles have a significant influence on learners' learning strategy choices among university students in Iran. On the other hand, some evidence rejects this association. For example, a study by Shih and Gamon (2003) revealed that the learning styles of the students did not affect their achievement in web-based courses. Additionally, students who were field-independent or field-dependent were similar in terms of their learning strategies. They concluded that learning styles did not have an impact on students' motivation and learning strategy use.

In her investigation of a potential relationship between students' learning style and strategy preferences while reading, Tabanloglu (2003) used a questionnaire and think-aloud protocol in a study to show that students' major learning style preferences were auditory and individual learning. Cognitive strategies were found to be the most prevalent among students; however, no significant relationships between learning styles and meta-cognitive strategies were revealed. Another study is that of Li and Qin (2006) conducted with second-year undergraduates (male = 94, female = 93) in China; it demonstrated that learning styles had a significant effect on learners' learning strategy use. The findings also revealed that high achievers were more competent in using strategies that were related to their non-preferred styles in comparison with low achievers. Based on their research findings, they claimed that learning styles could affect learners' language learning through their relationships

with learning strategies. As such, they recommend that teachers include learning styles in learning strategy teaching. In a similar study investigating the influence of learning styles on reading strategy use among 71 EFL non-English majors of two language proficiency levels (high and low) in New Tapei City via survey questionnaires, Pei-Shi (2012) showed that learning styles did not have much influence on the overall reading strategy use except for a significant difference between social strategy use and learning styles in that L2 learners with auditory learning style use more social strategies than those with visual learning style. The survey research methodology was also employed by Wong and Nunan (2011) in their comparative investigation into the learning styles and strategies of 110 effective and ineffective EFL language learners in Hong Kong. Findings of the study revealed that styles and strategies are complex and multifaceted, and although the results showed that over 50% of more effective learners were "communicative" in their overall learning style, and that this was significant, all styles were represented to varying degrees in both groups and, in fact, in all learners. The main difference between the more effective and less effective learners was basically attitudinal as the more effective learners in this study were more active and more prepared to take control of their own learning by spending significantly more time out of class practicing their English and displaying a greater degree of autonomy than the less effective learners. All strategies deployed by more effective learners that emerged as statistically significant carried an active learning aspect regardless of the style to which they correspond.

Uhrig's (2015) study attempts to address the extent to which learning styles influence language learning strategy choices based on qualitative data via two case studies of international students' learning strategy use in the course of reading texts in professional graduate programs in the US. Data were gathered through interviews, documents, and task logs and were analyzed to determine whether there were patterns of strategy use associated with particular learning styles. The findings indicated that participants' learning styles provided more predictability in strategy use in EAP reading tasks than other factors such as discipline. The two participants exhibited strategy use patterns consistent with concrete-sequential and analytic cognitive learning styles in the case of Tae (participant 1) and abstract-intuitive and global learning styles in the case of Rak (participant 2). In some study episodes, their strategies were more consistent with their individual learning styles than with the requirements of the learning context, such as Tae's insistence on learning individually before engaging in the group learning required by his MBA program and

Rak's increasingly exclusive use of social strategies in the law program. Based on reflections recorded in a personal diary, Ma and Oxford's (2014) attempt to describe an L2 advanced learner's (who is also the first researcher in this study) evolving learning styles and learning strategies for ESL listening and speaking while living in the US by examining both the internal context of attitudes, motivations, and emotions and the external context of the unfamiliar country, its culture, and the L2 learner's observable interactions with people in that culture in order to determine the extent to which internal and external contexts work together to affect her styles and strategies for learning. Results indicated that the researcher mainly had a reflective, introverted, and metaphorical learning style, which interacted with other elements of her learning, such as intuition, environmental effects, and cultural differences. Her diary nevertheless shows that she eventually manages the different aspects of her overall learning style and learns to use relevant meta-cognitive, cognitive, and affective strategies to overcome her difficulties while learning by listening to lectures and actively participating in classroom conversations that made her a more active classroom participant.

In general, the literature shows that there is a discrepancy between different studies on the link and degree of relationship between language learning strategies and learning styles. Even though much of the literature has revealed that there exists a relationship between learning styles and general learning strategies, no prior study has reported how learning styles might affect the use of vocabulary learning strategies manifested in a specific task. It would be fair to say from these reasons that further investigation into how (and to what extent) learning styles actually influence the choice of vocabulary learning strategies is worthwhile.

2.7. Conclusion

Chapter 2 explicitly focused on an in-depth analysis and critical discussion of the valuable educational constructs of self-regulation, self-esteem, and learning styles in an attempt to estimate its potential role in the area of foreign language learning, particularly in the process of second language vocabulary acquisition in an ESP tertiary education settings in Greece. A set of relevant empirical studies in the broader SLA field with respect to the effect of self-regulation, self-esteem, and learning style in various aspects provide the methodological platform for our study in the selection of the appropriate research instruments and in the procedures that can be adopted in the process of data collection.

The present study will mainly use quantitative data with a correlational design to evaluate the various factors that appear to or might affect the use of vocabulary learning strategies by Greek ESP learners. The research, therefore, begins by investigating vocabulary learning strategies in terms of frequency of use and, consequently, seeks to determine the role of self-regulation capacity in VLS use, as well as explores the effect of self-esteem and learning styles with respect to VLS use in an ESP context. The following chapter describes in detail the hypotheses and questions that have been formulated to direct our research as well as the methodology used to gather information on VLS use, self-regulatory capacity, self-esteem, and learning styles.

CHAPTER 3

RESEARCH METHODOLOGY AND RESULTS

3.1. Introduction

The present study was designed to investigate the use of vocabulary learning strategies by Greek ESP learners in aiding technical vocabulary learning of English courses at the university. It also examines the impact of certain learner variables on the use of vocabulary learning strategies, including differences in VLS use with respect to subjects' gender, vocabulary knowledge, self-regulation capacity, degree of self-esteem exhibited, and learning style. In this context, this chapter aims to provide detailed information about the research methodology followed in the study, including the context of the investigation (3.2.), research design and questions (3.3.), participants of the study (3.4.), data collection instruments (3.5.), and data collection procedures (3.7.), as well as scoring and quantitative analysis procedures (3.8.). The results of our study are presented and fully discussed by research question in the remaining sections of the chapter focusing on VLS frequency use (3.9.), the effect of self-regulation on vocabulary knowledge and VLS use (3.10.), the effect of self-esteem on VLS use (3.11.), and the effect of learning styles on VLS use (3.12.) by Greek ESP university students.

RESEARCH METHODOLOGY

3.2. The Context of the Investigation

The present study was conducted with first and second ESP undergraduate students at the Faculty of Agriculture and Forestry Science at the Democritus University of Thrace, Orestiada in Northern Greece. The ESP course attended by the students is a compulsory EFL for Specific Purposes syllabus, called 'English for Agriculture and Forestry' and is taught in both Departments of the Faculty, i.e., Department of Agricultural Development and Department of Forestry and Management of the Environment and Natural Resources. It is considered to be a course of general interest that is

divided into four modules and delivered for 2 contact hours every week for 13 weeks each semester in years 1 and 2 at the undergraduate level. The general objective of the course is to familiarize students with the technical terminology of their academic studies in English, enhance their reading, writing, speaking, and listening skills to enable them better structure and organize the language they produce in English and use it effectively and successfully to meet their educational and academic needs. The course has eight European Credit Transfer System (ECTS) workloads, corresponding to 200 hours: 110 face-to-face (FTF) and 90 independent work. All sessions take place in an amphitheater equipped with a blackboard and an overhead projector used for Powerpoint presentations for lecture purposes. In the hours devoted to independent work, the students are expected to use a virtual platform (Open e-Class learning management platform) for homework and revisions tasks.

Given that VLS use is likely to be affected by the teaching context in which it is studied, a brief overview of the Greek educational system regarding the instruction of foreign languages and typical ways of L2 vocabulary teaching in EFL Greek classrooms will be presented below. Generally, foreign language education in Greece is characterized by its dual private and state nature, where it is much commoner for all students to have experience English in the private sector long before they start learning the language in the state system. Taking this situation into account, although the participants in our study are all students who have attended mainstream state education, much of what they know and do in the English language class at the university is a product of whatever instruction they have already received in private English schools or 'frontisteiria' as they are most commonly called in Greek.

The basic nine-year state education starts at the age of 5 or 6 and continues until 15, covering attendance at primary school and secondary junior high school (Gimnasio). During the last decade, FL state education in Greece has witnessed some notable changes that initially led to introducing English as a first foreign language in primary education in grades 4 to 6 for 3 hours per week, addressing pupils from the age range of 10 to 12. Recent amendments in the National School Curriculum resulted in the expansion of English instruction to grade 3 in primary school as well as to teaching another foreign language, French or German, as a second choice but only on a pilot basis up to the present. These changes were viewed as an effort to minimize the need for private classes outside school and lead to a more independent, fully-integrated, and fair education system that can provide equal opportunities for free education to all people, irrespective of their socio-economic standing. Nevertheless, public

distrust and dissatisfaction with the quality of education offered by state schools are intense and, as a consequence, most of the foreign language learning usually and, predominantly, takes place in private foreign language schools where children usually start learning English at the age of 8 or 9 years old.

Moving to secondary education, young pupils have to attend junior high school (Gimnasio) for another three years in order to complete their basic education. After this period, students are usually confronted with two choices: to pursue their academic education by attending senior high school (Lyceum) and finally enter a university or turn to Technical education where the practically-oriented nature of courses aims at equipping students with skills in a range of technical specialties. The participants of our study are all students who attend the first two grades of senior high state school (Lyceum). Regarding FL instruction in all three types of secondary school, English is taught as the main foreign language and French or German as a second choice in primary education, while in Technical schools, only English is taught mainly with specific reference to the special terminology of each specialty (e.g., car mechanics, nurses, secretaries, etc.). Yet, it has to be pointed out that the conditions in all different kinds of school in the secondary state education sector do not really inspire and encourage foreign language learning: the maximum number of students in a single class is 30, time (2 hours per week) and equipment are insufficient, students' motivation, attitude and interest in foreign language classes dramatically flag year by year up until their graduation. This is attributed to two reasons: (i) in the Lyceum, the extremely competitive and academically hard character of the university entrance examinations that students have to take in completing their studies.

During the two final years of the Lyceum, students tend to focus on the subjects they need in view of exams and neglect other subjects, including, first and foremost, the foreign languages. English is not part of the entrance exam except for those students who intend to become English majors. (ii) in Technical schools, the immensely non-academic nature of the syllabus followed whose main emphasis lies in the development of practical skills and abilities of certain professions. Clearly, students in these schools are more interested in mastering the requirements of their specialty, thus securing a place in the job market, rather than in the learning of theoretical, general study subjects that would equip them with nothing more than encyclopedic knowledge. Since employers do not require English skills in most menial jobs (e.g., plumbers, car mechanics, carpenters, etc.) in Greece, graduates of technical schools do not consider

learning a foreign language necessary for their future professional career and development. For either reason, it is quite typical for students of the Lyceum or Technical school to have dropped private English lessons at 'frontisteirion' by the time they have reached the final year of their studies at state schools.

Foreign language learning in tertiary education includes classes of French, German, Italian, and/or English, and except for English majors, it does not take into account the individual student's knowledge. Even at this level, university students who do not have the chance to improve their English during their school years usually take private English lessons as proficient knowledge of English as a first foreign language is considered a necessary qualification for either job or postgraduate study purposes. Within the university context, learners mainly do some revision work of the things the students might have already been taught, and they focus on the Technical Terminology necessary for the foreign language bibliography the student would likely need (ESP classes). These language classes occur 2-3 hours per week for the first two years of the studies. Not many students attend those classes because language classes are usually neglected by the compilers of the official timetables: they are put either too early in the morning, or too late in the evening, or even during lunch break or rest hours. The usual excuse is that there is no time even for the classes and the laboratories of the main subjects, let alone secondary ones. Consequently, we cannot talk about either quality or quantity of instruction in the foreign language.

As far as teaching vocabulary in the Greek EFL classroom is concerned, the extent of attention to vocabulary learning varies depending on the level of education and the teaching methodology followed. Overall, EFL classes in primary and secondary education draw on the Cross-Thematic Curriculum Framework for Foreign Languages, and EFL teaching follows a holistic approach to knowledge with an emphasis on all four language skills (reading, listening, speaking, writing) along with vocabulary and grammar development through communicative, task-based approaches, cooperative work, and alternative assessment methods. Vocabulary teaching in the basic and intermediate levels is initiated primarily by the teacher who reads the reading passage, writes new words on the board, and pronounces them for students. The Greek language often dominates the classroom interaction, especially when explaining the meaning of new words. Subsequent consolidation of word knowledge and proper use is mainly achieved via a range of word games, stories, songs, and productive activities based on students' ages and interests. At these levels, using some VLSs may implicitly be encouraged as when teachers

usually make the class repeat words aloud after him or her to learn pronunciation or when students are asked to write down a list of new words to memories them.

Within the university level, in the context of our study, the introduction of ESP vocabulary is achieved via related reading texts of the academic genre where students are asked to read silently for a few minutes in order to build a general understanding and underline words that are unknown to them. The teacher then encourages students to discuss what they have read and understood in the classroom by prompting them to use whatever vocabulary knowledge they currently know. During the discussion, new vocabulary is used, written on the board, explained thoroughly in terms of meaning, pronunciation, and usage. Throughout the lesson, students have the opportunity to ask the teacher for word information in either English or Greek, and vocabulary consolidation is also supported through extra listening and writing tasks on issues that are of interest to students of a given academic discipline, such as Agriculture and Forestry in our case. VLS use is not explicitly promoted via the available ESP teaching materials, but incidentally introduced to students as necessary techniques to cope with reading material and producing academic writing in their subject matter when studying in English as a foreign language. Use of strategies such as guessing the meaning of unknown words and proper use of dictionaries and note-taking VLSs are constantly highlighted as the most useful vocabulary learning strategies that can promote EFL vocabulary knowledge and enhance their academic prospects in English as a foreign language.

3.3. Research Questions and Design

The exploratory nature of the study together with the literature previously reviewed gives rise to the following research questions that have not been fully answered concerning the use of VLS by Greek ESP learners majoring in the sciences of Agriculture and Forestry.

A. Overall Vocabulary Learning Strategy Use by ESP Learners

- **Research Question 1A**

What are the most and least frequently used VLS for ESP learners?

- **Research Question 2A**

What are the most and least frequently used VLS categories for ESP learners?

- **Research Question 3A**

Is there a relationship between VLS frequency use by ESP learners and gender?

- **Research Question 4A**

Is there is a relationship between VLS frequency use by ESP learners and their English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

B. Vocabulary Learning Strategy Use Per Category by ESP Learners

Lexical Guessing Strategies

- **Research Question 1B**

What type of lexical guessing strategies are most and least frequently used by ESP learners?

Dictionary Use Strategies

- **Research Question 2B**

What is the most frequently used type of dictionary by ESP learners?

Hypothesis 2:

Bilingual dictionaries are more frequently used by all learners than monolingual dictionaries.

Hypothesis 3:

Electronic dictionaries and internet-based dictionaries are the least frequently used vocabulary reference works.

- **Research Question 3B**

What is the order of frequency with which different kinds of information are looked up in the dictionary?

Repetition Strategies

- **Research Question 4B**

What type of repetition is most and least frequently used?

- **Research Question 5B**

What information about new words is most and least handled repeatedly?

Social-Discovery Strategies

- **Research Question 6B**

What type of person is the most and least frequently asked for information about new words?

- **Research Question 7B**

What is the most frequent kind of information they ask for and from whom?

- **Research Question 8B**

What is the order of frequency with which different kinds of information about new words are requested?

▪ **NOTE-TAKING STRATEGIES**

- **Research Question 9B**

What is the most and least frequent place for keeping a note of new words?

- **Research Question 10B**

What is the order of frequency with which different kinds of information about new words are written down?

- **Research Question 11B**

What is the most and least frequent way of organizing notes about new words?

ASSOCIATION STRATEGIES

- **Research Question 12B**

What type of association is most frequently used?

Hypothesis 1:

The Keyword Method is the least-frequently used association strategy.

CONSOLIDATION STRATEGIES

- **Research Question 13B**

What type of consolidation strategies are most and least frequently used?

C. SELF-REGULATION, GENDER AND VOCABULARY KNOWLEDGE

- **Research Question 1C**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and gender?

- **Research Question 2C**

Is there is a relationship between the self-regulation capacity that ESP learners exhibit and English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

D. Self-Regulation and the Use of Vocabulary Learning Strategies

- **Research Question 1D**

Is there is a relationship between the self-regulation capacity that ESP learners exhibit and the use of vocabulary learning strategies, overall and in categories?

- **Research Question 2D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of guessing strategies as a category?

- **Research Question 3D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of dictionary strategies as a category?

- **Research Question 4D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of social-discovery strategies as a category?

- **Research Question 5D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of note-taking strategies as a category?

- **Research Question 6D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of repetition strategies as a category?

- **Research Question 7D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of association strategies as a category?

- **Research Question 8D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and the use of consolidation strategies as a category?

- **Research Question 9D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual guessing strategy?

- **Research Question 10D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual dictionary use strategy?

- **Research Question 11D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual social-discovery strategy?

- **Research Question 12D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual note-taking strategies as a category?

- **Research Question 13D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual repetition strategy?

- **Research Question 14D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual association strategy?

- **Research Question 15D**

Is there a relationship between the self-regulation capacity that ESP learners exhibit and any individual consolidation strategy?

E. Self-Esteem, Gender and Vocabulary Knowledge

- **Research Question 1E**

Is there a relationship between ESP learners' level of self-esteem and gender?

- **Research Question 2E**

Is there is a relationship between ESP learners' level of self-esteem and English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

F. Self-esteem and the Use of Vocabulary Learning Strategies

- **Research Question 1F**

Is there is a relationship between self-esteem and vocabulary learning strategies, overall and in all categories?

- **Research Question 2F**

Is there a relationship between self-esteem and any individual vocabulary learning strategies?

G. Learning Style and the Use of Vocabulary Learning Strategies

- **Research Question 1G**

Is there is a relationship between ESP learners' learning style and the use of vocabulary learning strategies overall?

- **Research Question 2G**

Is there a relationship between ESP learners' learning style and the use of guessing strategies as a category?

- **Research Question 3G**

Is there a relationship between ESP learners' learning style and the use of dictionary strategies as a category?

- **Research Question 4G**

Is there a relationship between ESP learners' learning style and the use of social-discovery strategies as a category?

- **Research Question 5G**

Is there a relationship between ESP learners' learning style and the use of note-taking strategies as a category?

- **Research Question 6G**

Is there a relationship between ESP learners' learning style and the use of repetition strategies as a category?

- **Research Question 7G**

Is there a relationship between ESP learners' learning style and the use of association strategies as a category?

- **Research Question 8G**

Is there a relationship between ESP learners' learning style and the use of consolidation strategies as a category?

- **Research Question 9G**

Is there a relationship between ESP learners' learning style and any individual guessing strategy?

- **Research Question 10G**

Is there a relationship between ESP learners' learning style and any individual dictionary use strategy?

- **Research Question 11G**

Is there a relationship between ESP learners' learning style and any individual social-discovery strategy?

- **Research Question 12G**

Is there a relationship between ESP learners' learning style and any individual note-taking strategies as a category?

- **Research Question 13G**

Is there a relationship between the self-regulation capacity and any individual repetition strategy?

- **Research Question 14G**

Is there a relationship between ESP learners' learning style and any individual association strategy?

- **Research Question 15G**

Is there a relationship between ESP learners' learning style and any individual consolidation strategy?

The study was conducted in the form of a survey that efficiently enabled us to collect a large amount of data on VLS use by Greek ESP learners and measure their self-regulation capacity in a relatively short time (Babbie 1990; Fowler 2013). The survey was cross-sectional (i.e., it

was administered at a single point in time), and two main closed-ended questionnaires were adapted, translated into Greek, and used to collect all the required data for the study (see 3.5. Instruments below).

3.4. Participants

Participants of the study were 297 first- and second-year undergraduate students in the Faculty of Agricultural and Forestry Sciences at the Democritus University of Thrace, attending English as a compulsory module in the first four semesters of their overall academic studies in both the Department of Agricultural Development and Department Forestry and Management of the Environment and Natural Resources. The ESP course forms an integral part of the syllabus of the Faculty viewed as a module of general interest and is divided into four courses taught for 2-hours every week for 13 weeks per semester in years 1 and 2 at the undergraduate level. The general objective of the course is to familiarize students with the technical terminology of their academic studies in English, enhance their reading, writing, speaking, and listening skills to enable them better structure and organize the language they produce in English and use it effectively and successfully to meet their educational and academic needs.

More specifically, the sample consisted of 140 male (47.1%) and 157 (52.9%) female students with a mean average age ranging between 18-25 years old (97.8%) who had already spent 7.5 years on average learning English as a foreign language. 192 (64.6%) of the participants were Agriculture students, and 105 (35.4%) were students of Forestry, with 142 (47.8%) and 101 (34%) in the first- and second-year of their studies, respectively. Only 42.4% (126) of the participants reported knowledge of other foreign languages (other than English), and 57.6% (171) stated no such knowledge. Based on the participants' profile as described here, the sample is said to be representative of the average student attending state universities in Greece with all subjects having Greek as their L1 (98.3%) and belonging to the same social mix, consisting of middle and working class students mostly coming from rural areas of the country.

3.5. Instruments

3.5.1. The Vocabulary Learning Strategies Questionnaire (VLS-Q)

A 75-VLS item questionnaire based on Marin's (2005) VLS classification system where VLS strategies are presented into three main groups

(strategies to deal with unknown vocabulary, taking vocabulary notes, and memorizing/consolidating vocabulary), reflecting the logical sequence that learners may follow when meeting unfamiliar vocabulary items from initial discovery to consolidation whenever the learner decides to do something about it (Appendix A). The VLS-Q used in this study consisted of an adapted and modified Greek version of Marin's (2005) Vocabulary Learning Strategies Questionnaire (VLS-Q) with changes in the wording of vocabulary items and elimination, substitution, and addition of vocabulary strategies that fit in with the ESP context of our study.

Instead of using the 6-Likert type scale of the original questionnaire, learners in our study were asked to state the vocabulary strategy use, employing Vougiouklis and Kambakis-Vougiouklis (2013) continuous bar by cutting the bar at any point they feel best expresses their answer to the specific question instead of deciding and checking a specific grade on the scale. According to the researchers (Vougiouklis and Kambakis-Vougiouklis 2011; Kambakis-Vougiouklis and Vougiouklis 2008), the innovative feature of bars as measurement instruments incorporated in empirical linguistics questionnaires is attributed to the multiple benefits it holds for the researcher and the participant alike as it (a) gives the initiative to researchers to access and process completed questionnaires in more than one ways establishing balanced or imbalanced scales according to the needs of the specific research each time and (b) gives access to a fuzzy attitude on the part of the participant since it requires a mapping in the space 01 instead of a discrete answer of 0 or 1. (Vougiouklis and Kambakis-Vougiouklis2015). The Greek versions of the scales were validated through assessing the Cronbach's alpha reliability coefficients and conducting item analysis with 76 ESP learners (34 males and 42 females) who were invited to participate in a pilot study. Internal consistency reliability for each of the scales of the questionnaire ranged from 0.599 (scale 1), 0.748 (scale 2) 0.852 (scale 3), 0.858 (scale 4), 0.639 (scale 5), 0.765 (scale 6) to 0.647 (scale 7) while Cronbach's alpha value for all scales was found as high as 0.92 for this study.

3.5.2. The Self-esteem questionnaire

The independent variable, self-esteem, was assessed by the Foreign Language Self-Esteem Scale developed by Hasan (2001) to measure the self-reported degree of self-esteem among foreign language learners (Appendix B). The FLSES is made up of 25 items and includes four

sections: a) language ability, b) actual in-class language use, c) in-class relationships, and d) attitude toward and/or behavior in the foreign language (FL) class. This classification of the different sections of the FLSES is partly based on Coopersmith (1967) and Heyde-Parsons (1983). Coopersmith (1967), for instance, indicates that one aspect of self-esteem is the extent to which an individual believes feels capable. FLSES items are statements that students respond to on a 5-point Likert scale, ranging from strong agreement to strong disagreement. To correct for the effects of acquiescence, some items were worded negatively (e.g., I don't feel at ease when I talk to my FL instructors). Possible scores on the FLSES range from 25 to 125. Internal reliability of the Greek version of the questionnaire achieved an alpha coefficient of 0.71.

3.5.3. Learning Styles Survey (LSS)

The LSS (Appendix C) constructed by Cohen, Oxford, and Chi (2001) was designed to be used by educators to draw students' attention to their preferred learning styles so that they might be coached to "use their styles to their advantage and to stretch their styles by making use of strategies that they may have resisted in the past" (Cohen and Weaver 2006, 9). The LSS consists of 110 items divided into 11 categories: How I use my physical senses (Visual, Auditory, or Tactile/Kinesthetic); How I open myself to learning situations (extraverted or introverted); How I handle possibilities (Random- Intuitive or Concrete-Sequential); How I deal with ambiguity and deadlines (Closure-Oriented or Open-Oriented), How I receive information (Global or Particular); How I further process information (Synthesizing or Analytic); How I commit materials to memory (Sharpener or Leveler); How I deal with language rules (Deductive or Inductive); How I deal with multiple inputs (Field-Independent or Field-Dependent); How I deal with response time (Impulsive or Reflective); How literally I take reality (Metaphoric or Literal). The LSS uses a 5-point Likert scale to measure participant responses: 0 (Never), 1(Rarely), 2 (Sometimes), 3 (Often), 4 (Always). Cronbach's alpha coefficients for the 23 learning style scales of the Greek version of the questionnaire were found to be 0.58 (visual scale 1), 0.52 (auditory scale), 0.64 (tactile scale), 0.61 (extroverted scale), 0.33 (introverted scale), 0.64 (random-intuitive scale), 0.51 (concrete-sequential scale), 0.74 (closure-oriented scale), 0.55(open scale), 0.56 (global scale), 0.20 (particular scale), 0.57 (synthesizing scale), 0.15 (analytic scale), 0.55 (sharpener scale), 0.31 (leveler scale), 0.42 (deductive scale), 0.41 (inductive scale), 0.56 (field-independence scale), 0.26 (field-dependence scale), 0.40 (impulsive scale),

0.69 (reflective scale), 0.62 (metaphoric scale), and 0.43 (literal scale). The total internal consistency reliability of 110-itemLSS as measured by Cronbach alpha coefficient was found to be 0.84 for this study.

3.5.4. The Self-Regulating Capacity in Vocabulary Learning Questionnaire (SRCvoc)

The Self-Regulating Capacity in Vocabulary Learning Questionnaire (SRCvoc) was developed by Tseng et al. (2006) (Appendix D). It is based on Dornyei's (2005) research on self-motivational strategies, and consists of 20 items and participants had to make their responses on a seven-point Likert scale ranging from *1-strongly disagree* to *7-strongly agree* by circling the appropriate number on the scale for the option that expressed their personal vocabulary learning experience the best. These 20 items measured five facets of control: commitment, meta-cognitive, satiation, emotion, and environment control. Each of the five facets in the scale included four items. Items 4, 7, 10, and 13 make up commitment control, which helps learners preserve and enhance their original goal commitment. Meta-cognitive control (items 5, 9, 11, and 16) assists the learners in monitoring their concentration and reducing any inhibiting factors. Satiation control (items 1, 8, 18, and 19) helps avoid boredom and adds interest to the task. Emotion control (items 2, 6, 12, and 15) is related to the management of emotional states or moods, while environment control (items 3, 14, 17, and 20) helps the learner control negative environmental influences. Cronbach's alpha coefficients for the five scales of the Greek version of the questionnaire for the commitment control scale is0.56, for the metacognitive control scale,0.69, for the satiation control scale,0.45, for the emotion control scale,0.35, and for the environment control scale 0.65, while total internal reliability for all scales of the questionnaire achieved a high alpha coefficient of 0.83.

3.5.5. The Vocabulary Levels Test (VLT)

The Vocabulary Levels Test (VLT, Test B, Nation, 2001) at the academic level was administered electronically in this study to measure the subjects' current English lexical knowledge together with the Self-Regulatory Capacity questionnaire (Appendix E). The test, originally, devised by Nation (1990), has been used by many researchers as a reliable and valid measure of receptive vocabulary size. It is divided into five levels, i.e., the 2,000- and the 3,000-word levels, containing high-frequency words, the 5,000-word level that borders between high- and low-frequency

words, and the 10,000-word level, containing low-frequency words. The academic word-level represents knowledge of words common in academic English, and since all subjects in the study were advanced learners of English opting for university studies, it was considered a suitable means to record their current vocabulary knowledge.

Each section of the test consists of twelve clusters, including six words on the left and three definitions on the right, and subjects are asked to select the words from each six-word cluster that corresponds to the three words on the right-hand column. This type of item is chosen as it is easy to construct and score by giving one mark for each correct matching of a word and its definition. The chances of guessing are low, and learners' scores on the test can be taken as a close approximation to the proportion of words in the test that they know. According to Nation (1990, 263), the basic idea behind the vocabulary test is to provide information on the learners' vocabulary knowledge that will guide the use of appropriate teaching and learning strategies towards increasing their vocabulary size in English as a second language.

3.6. The Use of Vougiouklis and Vougiouklis Bar (V&V bar)

Originally derived from fuzzy theory, the V&V bar used in our questionnaires was originally applied in the field of applied linguistics by Kambaki-Vougioukli and Vougiouklis (2008) as a response to amend problems caused by using Likert scales. According to the researchers (Kambaki-Vougiouklis 2009), placing Likert scales with the 'bar' facilitates both the subjects to provide answers by vertically intersecting the bar on the point they believe better reflects their answer at that specific moment, rather than choose from a pre-decided scale. The whole process is easy to understand, and it minimizes the filling-in and processing time of the data collecting. The tool benefits researchers with processing of results, as one of the main assets of the tool is that it takes minimal time and effort to fill in a questionnaire and also enables the researcher to implement different types of processing, even long after the completion time, depending on each time chosen division to make the results recognizable and comparable with others (Vougioukli and Vougiouklis 2015). In this respect, the V&V bar seems to be the ideal tool for multiple processing, overcoming the shortcomings of repeating the same experiment, combining 'continuous' and 'discrete' all in one go (Vougiouklis 1994; Corsini and Leoreanu 2003; Davvaz and Loreanu 2007; Vougiouklis 2008; Vougiouklis and Kambakis 2008; Kambakis-Vougiouklis et al. 2011; Nikolaidou and Vougiouklis

2012). Feelings of fatigue by participants are avoided during data collection while the instrument also enables the researcher to take different paths of analysis, choosing to approach the data from a philosophical point of view, interweaving psychological parameters while using a continuous model, or investigating transfer and processing and implementing the discrete model (Vougioukli and Vougiouklis 2015). Thus, using the bar might be thought of as a breakthrough in quantitative research, a tool which if implemented, can support the researcher in both data collecting and processing.

When asked to answer, participants do not need any special instruction and do not need to distinguish the inconspicuous differences between two subdivisions on the scale. The psychological factor plays a very important role because the participants will intersect the bar [01] with a vertical line, based primarily on their intuition, which, at that particular moment, determines the most accurate point. The bar gives the possibility of a fuzzy attitude since it basically calls for a map on the linear segment [0, 1] instead of a 0 or 1 answer. This process can be likened to the effort of a car to go up or down (a) an inclined level, i.e., the bar, or (b) a flight of stairs, i.e., the Likert scale. Similarly, it can be likened to a person's effort to get on a plane with a wheelchair using a ramp rather than a flight of stairs. Consequently, when it is necessary to choose from a list such as *'very good, good, fairly good, almost good, not really good, not good, not good enough, rather bad, not very bad'*, etc.,- of course there are even more options - we cannot be sure that we will be able to explain the extremely subtle differences between escalations and make them completely distinguished from other similar choices, making them in this way comprehensible to all participants of different ages, genders, linguistic, cultural and religious beliefs. However, using a continuum, the V&V bar, instead of a predefined discrete, it is each individual who will decide where exactly to intersect the bar at a specific moment without any subjective language explanations. Because one could argue that through explanations, we might impose, involuntarily or voluntarily, our own perceptions on the participants, something that is both wrong and undesirable.

Lygeros refers to the advantages of the bar: 'The innovation of the Vougiouklis and Vougiouklis bar (V&V bar) in replacing the scale with the bar has deep roots in the controversy between continuous and discrete. The tool they propose is not an extra addition to the mass of tools. The V&V bar tries to overcome, in an artistic mathematical way, the methodological problems of simplification that are created by a model such as the Likert scale. With the bar, 'it is easy to apply all the techniques of various distributions like Bernoulli, Poisson, and Gauss; the bar can

also act as a tool for controlling the possibilities of all forms of scales' (Lygeros 2009, 1). Markos (2017) also emphasizes the obvious advantage of the V&V bar that the researcher will not have to decide about the parameters in advance, nor clarify the fine differences between subdivisions. In this way, the continuous data can be transformed into a form comparable to that of the categorized data allowing analyses identical to those done with questionnaires using conventional scales, even more with a variety of partitions.

3.7. Data collection Procedures

Data were collected in the winter semester of the academic year 2019-2020 by the researcher, who also served as the instructor for the English course in both departments, after obtaining permission from the dean of the Faculty of Agricultural and Forestry Sciences. In general, all students were willing to participate in the study, especially when they were informed that they would be granted an extra in the final grade for their English course for the current semester. Nevertheless, they showed an active interest in knowing the results of the study and were intrigued by the fact that they would act for the first time as the subjects of a research study in the area of foreign language learning.

The three survey questionnaires, i.e., the Vocabulary Learning Strategy Questionnaire (VLS-Q), the Self-Esteem, and Learning Styles questionnaires, were administered to the students in print form during the mid-term exam session for their ESP course to ensure maximum participation, and their completion lasted approximately 1 hour and 15 minutes in total. Students were first asked to complete their mid-term exam and then later asked whether they were willing to participate in the study by being reminded that their involvement would also be rewarded by an extra mark for their ESP course. The majority of the students agreed to help the researcher while withdrawals from the process were scarce. In order to avoid unnecessary confusion and misunderstandings, detailed instructions and an example were provided to participants so that they would be familiarized with the use of the bar to indicate their responses with respect to the vocabulary strategy use, degree of self-esteem, and type of learning style. Overall, no particular difficulties were noticed by learners feeling comfortable with the process despite their initial bewilderment with the instrument.

The Self-Regulating Capacity in Vocabulary Learning Questionnaire with the bar along with Nation's VLT was administered electronically a week later due to time limitations. The construction and administration of

the electronic version of the V&V bar in the Self-Regulating Capacity questionnaire were feasible via SmartSurvey (www.smartsurvey.com) an online, user-friendly survey software and questionnaire tool that facilitate data collection in a fast and accurate way; it has the advantage of being accessible to students at any time of the day they wished to access and fill them. Results could automatically be transferred for processing in a much faster way as the Smart Survey tool allowed us to download and store them directly into SPSS or Excel files, thus minimizing the time needed for data entry and also eliminating potential human mistakes in the process. Students were quickly familiarized with the program interface and faced no significant problems when filling in the electronic questionnaires. Following their comments, the electronic version of the bar was significantly easier for them to use as they had the opportunity to change their answers just by clicking on another on the scale any time before their final submission, stating that their responses were nice and clearly without the fear of smudges and corrections so often present in the print version of the instruments.

3.8. Data Analysis

The quantitative data collected via the VLS-Q, the Self-esteem, Learning styles, the Self-regulating questionnaires, and the VLT were entered into SPSS 21 (Statistical Package for Social Sciences). Similarly, background information about the participants was numerically incorporated into SPSS and included gender, age, mother tongue, English learning experience, university year of study, subject of study, and knowledge of other foreign languages besides English. Vocabulary knowledge as measured by Nation's VLT test at the Academic Level was entered separately and the total mean score was calculated. The VLS-Q data were initially entered in seventy-five columns, serving as the dependent variables of the study. The rating of the 75 variables was also later averaged to produce scores for the seven vocabulary learning strategy categories included in the questionnaire and were grouped as follows:

1. Guessing Strategies (Strategies 1-11)
2. Dictionary Use Strategies (Strategies 12-19)
3. Social Discovery Strategies (Strategies 20-28)
4. Note Taking Strategies (Strategies 29-51)
5. Repetition Strategies (Strategies 52-60)
6. Association Strategies (Strategies 61-70)
7. Consolidation Strategies (Strategies 71-75)

Further exploratory groupings were made from the seven categories by considering the nature of the strategies themselves, i.e., the strategies were put into other sets that also logically belong together. For instance, within the category of dictionary use strategies, three sub-categorizations arose based on the kind of dictionary learners reported they frequently use when they look up a new word, namely, 'monolingual dictionary', 'bilingual dictionary' and an 'online dictionary'. Another sub-categorization within the same category was concerned with the type of word information most frequently looked up in a dictionary yielding five groups, i.e., looking up for meaning, spelling, pronunciation, examples for proper use of the word, and grammar of the word. With respect to the independent variables of self-esteem, self-regulation vocabulary capacity, and learning styles included in our study, data were also separately entered into the SPSS, and total mean scores were derived for self-esteem and self-regulation vocabulary capacity, respectively. Mean scores were also derived for each of the five separate facets of self-regulatory control included in the self-regulation vocabulary questionnaire, i.e., commitment, metacognitive, satiation, emotion, and environment control. Finally, mean scores were also derived for each of the 23 learning styles of the questionnaire in order to find the dominant learning styles for the participants of our sample.

The main descriptive and inferential statistical methods used for the data analyses included Pearson correlations and multiple regression analyses. Following Hatch and Lazaraton (1991), Pearson correlation aims to establish the strength of relationships among continuous variables. In this study, we set out to investigate the relationship between vocabulary knowledge and vocabulary learning strategy use. Additionally, it was of interest to us to also explore possible relationships between vocabulary learning strategy use, degree of self-esteem, and learning style. Multiple regression (MR), on the other hand, aims to investigate the linear relationships between three or more variables by providing estimates of both the magnitude and statistical significance of relationships between variables (Gall, Borg, and Gall 1996). Most importantly, MR helps us to identify the predictor variables that together predominantly account for a criterion variable. In our study, stepwise multiple regression analyses were used to explore the effect of the five self-regulation capacity sub-components on different VLS separately and scores for sets of strategies grouped together. Finally, one-way within subjects ANOVA was used for the analysis of VLS use irrespective of the three exploratory variables of our study as it happened when analyzing the mean frequency ratings for the three different types of dictionary to detect significant differences,

while independent t-tests were used when exploring significant gender differences with respect to VLS use both individually and in categories.

RESULTS OF THE STUDY

Having summarized our research questions and described both data collection and analysis procedures, we now report and discuss the results obtained in our exploratory study. The rest of this chapter is organized into five main sections corresponding to the specific research questions posited at the beginning of our study. Section 3.9. is generally concerned with descriptive statistics with respect to the self-reported frequency use of vocabulary learning strategies both separately and in categories for all subjects together. Section 3.10. focuses on the relationship between self-regulation capacity and gender, and, subsequently, presents the results regarding the relationship between self-regulation and VLS, again both separately and in categories, i.e., the correlational analysis. Sections 3.11. and 3.12. also provide the results of correlational analyses for the relationships between self-esteem and learning style and use of vocabulary learning strategies in an ESP context, respectively. Multiple regression analyses are also used to examine the contribution of self-regulation, self-esteem, learning styles, and gender on the frequency of use of vocabulary learning strategies by ESP university learners.

3.9. Vocabulary learning strategies: Frequencies

3.9.1. The most and least frequently used vocabulary learning strategies

In this section, we present a description of our ESP learners' self-reported overall frequency of use of the seventy-five Vocabulary Learning Strategies (VLS) included in the study questionnaire, making use of V & V bar (Vougiouklis and Vougiouklis 2005). Next, VLS frequency of use is discussed in relation to each VLS category and an account is also provided of some relevant differences in strategy use within each VLS category in order to report the most and least frequently used individual strategies.

RQ1A: *What are the most and least frequently used VLS for ESP learners?*

In general, ESP learners appear to have a moderate to low rate of self-reported use of vocabulary learning strategies (overall mean = 3.50), a

little bit above the middle of the 1-6 scale. Twenty-five strategies had a mean score above 4, indicating that learners use these strategies more or less frequently. The rest of the strategies obtained a mean score below 4, but only 5 strategies were reported to hardly ever be used by the ESP learners with mean frequency ratings below 2 (see Appendix F for overall VLS use in frequency order). This relatively low use of VLS could largely be attributed to learners' lack of training in vocabulary learning strategies as well as to an expressed unwillingness on their part to take an active interest in foreign language learning while attending primary and secondary school.

Table 3.1. below shows the ten most frequently VLS used by all ESP learners in our study, regardless of the degree of self-regulation, gender, year of study, and vocabulary knowledge. The results indicate that learners make extensive use of lexical guessing strategies as they (Strategies 6, 1, and 7) rank among the top five strategies. Other most frequently used strategies are concerned with keeping notes about vocabulary items (Strategies 36 and 29), dictionary use (Strategies 14, 15, 17, and 19), and memorization of new words (Strategy 57). None of the strategies from the Social, Association, and Consolidation categories appear in the most frequently reported VLS.

According to these results, ESP learners seem to heavily rely on lexical guessing strategies for learning technical vocabulary in their ESP course as three of them rank among the top five strategies. The use of four dictionary-related strategies also appears to be the second-best choice for ESP learners in vocabulary learning, exhibiting a clear preference towards using online dictionaries to check the meaning of unknown technical words. Clearly, this pattern of results contradicts findings in Marin's (2005), Nakamura's (2000,) Lessard-Clouston's (2008), and Akbari and Tahririan's (2009) studies where learners were found to make extensive use of bilingual dictionaries primarily in print form. Greek ESP learners also tend to favour, considerably, the use of certain note-taking strategies as they reported often writing down the Greek translation of a new word and organized their vocabulary notes per class session. Such a finding confirms results found in Marin's (2005) and Al-Qahtani's (2005) respective studies where writing down of L1 translation of a word was also frequently used. Repetition of new words with their translation in Greek confirms previous results by Akbari and Tahririan (2009) and Alqatani (2005) as one of the most-frequent used strategies.

Table 3.1. The 10 Most-Frequently Used VL strategies among ESP Learners

Rank	Type of VLS	No. & Name of VLS	N	Mean	Std. Deviation
1.	**Lexical Guessing (LG)**	**6.** I use the words in the sentence and/or paragraph to guess the meaning of an unknown word.	**297**	5.4916	1.27903
2.	**Note-Keeping (NK)**	**36.** I write down the Greek translation of a technical word.	**297**	5.2458	1.60558
3.	**Dictionary Use (DU)**	**14.** I use an online dictionary to check the meaning of a word.	**297**	5.1852	1.69739
4.	**Lexical Guessing (LG**	**1.** I check if the new word looks like a Greek word.	**297**	5.1111	1.67789
5.	**Lexical Guessing (LG**	**7.** I rely on the text to understand the meaning of a word.	**297**	4.8990	1.75431
6.	**Note-Keeping (NK)**	**29.** I keep notes of the new vocabulary in every class session.	**297**	4.8754	1.78620
7.	**Memorization (M)**	**57.**I repeat new words along with their Greek translations	**297**	4.8148	1.91968
8.	**Dictionary Use (DU)**	**15.** Use dictionary to check meaning (s).	**297**	4.7879	1.87231
9.	**Dictionary Use (DU)**	**17.** Use dictionary to check spelling.	**297**	4.7643	1.85587
10.	**Dictionary Use (DU)**	**19.** Use dictionary to check how new words are used in sentences.	**297**	4.7003	1.93678

Table 3.2. The 10 Least-Frequently Used VL strategies among ESP Learners

Rank	Type of VLS	No. & Name of VLS	N	Mean	Std. Deviation
1	**Consolidation (C)**	**72.** Write summaries using the new words.	**297**	1.6667	1.52014
2.	**Note-Keeping (NK)**	**34.** Keep notes in small cards to learn new words	**297**	1.8114	1.68202
3.	**Note-Keeping (NK)**	**47.** Classify new words based on their grammatical category when keeping notes	**297**	1.8586	1.69863
4.	**Note-Keeping (NK)**	**49.** Keep notes of the new words alphabetically	**297**	1.8788	1.71799
5.	**Consolidation (C)**	**73.** Search for more scientific texts to expand my vocabulary knowledge	**297**	1.9764	1.78851
6.	**Note-Keeping (NK)**	**48.** Classify new words based on topics when keeping notes	**297**	2.2189	1.92492
7.	**Note-Keeping (NK)**	**41.** Keep notes of the pronunciation of new words	**297**	2.3030	1.90015
8.	**Note-Keeping (NK)**	**42.** Keep notes of the grammatical category of new words	**297**	2.3266	1.93590
9.	**Note-Keeping (NK)**	**35.** Keep vocabulary notes on an electronic device	**297**	2.4074	2.04651
10.	**Consolidation (C)**	**71.** Test myself or have others test my vocabulary knowledge	**297**	2.4646	2.05981

Regarding the ten least-used strategies, table 3.2. above shows that several of these strategies are concerned with note-taking (seven out of ten). Following the pattern of these results, our learners do not usually choose an electronic device to keep their vocabulary notes, and they hardly ever use small cards to do so. Electronic devices as a means of note-keeping of new words were also among the least frequent strategies found by Marin (2005) and Stoffer (1995). In terms of organization of vocabulary notes, the findings show that vocabulary note-keeping based

either on the grammatical category of a new word or alphabetically is among the most infrequently used strategies among learners. The same tendency can be observed for other vocabulary organization strategies such as note-keeping that is based on lesson topics on word pronunciation and grammatical category. Similarly, Nakamura (2000) also reports that listing vocabulary items alphabetically, by grammatical category and keeping notes on vocabulary cards as the least frequently used strategies in her study.

The other two least-used vocabulary strategies that appear in the table belong to the consolidation VLS category. The strategy of writing summaries using the new words as a means of further word knowledge consolidation is the least frequently used vocabulary strategy out of the total 75 VLSs included in our questionnaire. This comes as no surprise as our ESP learners often express an inability and unwillingness to try the language in communicative writing or oral task in class and contend themselves with the completion of closed-ended grammar and vocabulary tasks of their set textbook. As expected, strategy 71 is also infrequently-used as a consolidation strategy due to its association with formal exam procedures.

3.9.2. Frequency of VLS by Category

RQ2A: *What are the most and least frequently used VLS categories for ESP learners?*

Analysis of the frequency of using VLS in categories appears to be slightly different from the analysis of separate strategies discussed above. In summary, the mean frequency rating of the VLS categories ranges from 2.56 to 4.22, which indicates that most of them were rated slightly above the middle of the scale used in the questionnaire. Table 3.3 shows that guessing strategies (mean = 4.22) were reported to be the most frequently used VLS category among all learners, followed by dictionary use strategies (mean = 4.14), in line with Marin's (2005) results. Interestingly, repetition and social-discovery strategies showed almost the same mean frequency rating with a similar pattern regarding note-taking and association strategies.

Table 3.3. Frequency of Strategy Use in Categories

VLS Category	Sig. Differences among Categories	N	Mean	Std. Deviation
1.Lexical Guessing Strategies	1 > 3,4,5,6,7 2 > 3, 4, 5, 6, 7	297 297	4.2277 4.1423	.90485 1.22041
2.Dictionary Use Strategies	3>7 4 > 5,7	297 297	3.6192 3.4785	1.10003 1.48189
3.Repetition Strategies	5 > 6,7, 6 > 7	297 297	3.2449 3.2165	1.00664 1.23284
4.Social-Discovery Strategies	7< 1,2,3,4,5,6	297	2.5616	1.29532
5.Note-taking Strategies				
6. Association Strategies				
7. Consolidation Strategies				

One way within-subjects ANOVA was also performed with the Bonferroni adjustment for multiple comparisons to explore further significant differences among the seven VLS categories F (6, 1776) = 114.812, p<0.001). In sum, the specific ESP learners employed guessing and dictionary use strategies to the same extent, and both categories were used significantly more often than any other VLS category. Further, consolidation strategies (the least-frequently used strategy) significantly differed from the rest of the VLS strategies, with the largest significant difference observed between the guessing and consolidation strategies (p<0.001). Note-taking strategies differed significantly from social-discovery, association, and consolidation strategies (p<0.001), and no significant differences arose between repetition and social-discovery, note-taking and association strategies as their means ranged from 3.2 to 3.6.

The overall mean frequency rating of VLS by categories provides a rather crude description of VLS used by all participants in our study. It therefore seems sensible to explore the frequency with which ESP learners use separate VLS that belong to each of the categories described above, i.e., to focus on frequency differences in strategy use within categories. The analysis that follows will provide evidence to support our initial questions and hypotheses. Thus, for each VLS category, we identify the

most- and least-used used VLS and concentrate on the most important differences in terms of frequency of use among VLS in each category.

RQ3A: *Is there a relationship between VLS frequency use by ESP learners and gender?*

The Independent t-tests (table 3.4. below) revealed a significant difference between males (mean = 3.20) and females (mean = 3.27) in the use of note-taking strategies as a category (t = -0.580, df = 295, p = 0.001), with females using them more often than males. Significant gender differences were also found in using twenty-four individual vocabulary strategies: 1 lexical guessing strategy (strategy #6 "use the context of the sentence to guess the meaning of the word"), 3 dictionary-use strategies (strategies# 14 "use an internet dictionary", 17 "check the spelling of a word in a dictionary" and 19 "check the sentences-examples of the word in a dictionary", two social discovery strategies (strategies #23 "ask my teacher for a translation of the word" and 29 "ask my teacher for the pronunciation of spelling of the word", 11 note-taking strategies (strategies# 33 "keep vocabulary notes in a notebook I use for other courses", 35 "keep vocabulary notes in an electronic device", 36 "note down the Greek translation of the new word"), 39 "note down double meanings of new words", 42 "note down the grammatical category of new words", 46 "keep vocabulary notes in organized sections of my notebook", 47 "classify new technical words by their grammatical category", 48 "classify new technical words by topic", 49 "note down new technical vocabulary alphabetically", 50 "note down new technical words wherever I meet them" and 51 "use different ways to highlight new key technical words", 3 repetition strategies (strategies #54 "write words many times", 57 "I repeat new words with their Greek translations" and 60 "I repeat the spelling of new words many times", 1 association strategy (strategy#65 "use the Keyword method" and 3 consolidation strategies (strategies #71 "I quiz myself", 72 "write small paragraphs using the new words" and 73 "read more scientific texts to enrich my vocabulary").

Strategies #33, 35, 42, 47, 48, 49, 72 and 73 were used more often by male than female ESP learners who, in their turn, tended to use strategies # 6, 14, 17, 19, 23, 29, 36, 39, 46, 50, 51, 54, 57, 60, 65 and 71 more frequently than males. Overall, no gender differences were found with respect to the overall VLS use (t = -1.522, df = 295, p = .196). In contrast to findings by Al-Qahtani (2005), Marin (2005) and Alyami (2011), VLS use by gender was found to affect the use of twice as much more

individual vocabulary learning than before, with females outperforming males in a wide variety of VLSs.

Table 3.4. Independent T-test Results for Gender Differences for 24 Vocabulary Learning Strategies

	Mean Male	Mean Female	t	df	p
LG Strategy#6	5.35	5.61	-1.716	295	0.001
DU Strategy#14	5.00	5.34	-1.713	295	0.001
DU Strategy#17	4.55	4.95	-1.887	295	0.001
DU Strategy#19	4.42	4.94	-2.362	295	0.003
SD Strategy#23	4.15	4.50	-1.482	295	0.01
SD Strategy#29	4.62	5.09	-2.265	295	0.005
NT Strategy#33	3.16	2.24	3.682	295	0.001
NT Strategy#35	2.85	2.01	3.589	295	0.001
NT Strategy#36	5.08	5.38	1.627	295	0.009
NT Strategy#39	3.73	4.50	3.118	295	0.001
NT Strategy#42	2.45	2.21	1.098	295	0.01
NT Strategy#46	3.93	4.47	-2.135	295	0.01
NT Strategy#47	2.20	1.54	3.398	295	0.001
NT Strategy#48	2.45	2.01	1.964	295	0.01
NT Strategy#49	2.11	1.66	2.246	295	0.001
NT Strategy#50	3.43	4.39	-3.852	295	0.002
NT Strategy#51	3.85	4.92	-4.374	295	0.001
R Strategy#54	4.25	4.75	-2.054	295	0.01
R Strategy#57	4.59	5.01	-1.890	295	0.001
R Strategy#60	2.97	3.15	-0.657	295	0.01
A Strategy#65	2.34	2.92	-2.297	295	0.001
C Strategy#71	2.08	2.80	-3.035	295	0.001
C Strategy#72	1.81	1.53	1.584	295	0.005
C Strategy#73	2.14	1.82	1.518	295	0.001

RQ4A: *Is there a relationship between VLS frequency use by ESP learners and their English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?*

Pearson's product-moment correlation coefficient was used to investigate the effect of vocabulary knowledge on individual vocabulary learning strategies and in categories. With respect to the effect of vocabulary knowledge on VLS use, results revealed a positive correlation between vocabulary knowledge and use of dictionary strategies as a category ($r=0.130$, $p<0.05$) as well as two negative (strategy #9 "skipping the new

word when I cannot guess its meaning" and strategy#33 "keep notes of the new vocabulary in a notebook I use in other courses") and four positive correlations (strategy #12 "looking up a new word in a bilingual dictionary", #18 "checking the grammatical category of the new word in a dictionary", #19 "checking the sentences-examples of the new word in a dictionary" and #51 "I say new words aloud to memories them"), with 6 out of the total 75 vocabulary learning strategies included in our questionnaire presented in Table 3.5. below. No significant correlation was found between vocabulary knowledge and overall use of VLS (r=0.079, p=0.174) among ESP learners in our sample. These results echo Al-Qhatani's (2005) and Alyami's (2011) findings where, in both cases, higher vocabulary proficiency was found to correlate with the use of deeper processing VLS, such as guessing the meaning from context, using a monolingual dictionary, and associations strategies.

Table 3.5. Pearson Correlation Results for Learners' VLS use and Vocabulary Knowledge

	Strategy #9	Strategy #12	Strategy #18	Strategy #19	Strategy #33	Strategy #51
Vocabulary Knowledge	-0.132*	0.165**	0.115*	0.122*	-0.123*	0.150**

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

3.9.3. Frequency of use within VLS categories

CATEGORY 1: Lexical Guessing Strategies (Mean = 4.22, SD = .9048)

RQ1B: *What type of lexical guessing strategies are most and least frequently used by ESP learners?*

Table 3.6. below indicates the eleven lexical guessing strategies of this category arranged in ranking order (mean frequency ratings range from 5.4 to 3.3., which place guessing as the most used VLS category). Most of these VLS obtained a rating above 4 (sometimes true of me), and none of them appeared listed within the 10 least frequently used VLS. Overall, a significant difference was observed among lexical guessing strategies ($F_{(10, 2960)} = 41.092$, $p < 0.001$).

Table 3.6. Summary of the Use of Lexical Guessing Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**6.** I use the words in the sentence and/or paragraph to guess the meaning of an unknown word.	**297**	5.4916	1.27903
2.	**1.** I check if the new word looks like a Greek word.	**297**	5.1111	1.67789
3.	**7.** I rely on the text to understand the meaning of a word.	**297**	4.8990	1.75431
4.	**8.** Go on reading and try to guess at the meaning of the new word another time	**297**	4.6061	1.97528
5.	**3.** Try to identify the grammatical category of a new word	**297**	4.2155	2.17029
6.	**2.** Analyze the structure of the word	**297**	4.0202	2.19018
7.	**9.** Skip the new word	**297**	3.9899	2.23680
8.	**5.** Look at pictures in the text to help me guess the meaning of new words	**297**	3.6835	2.22869
9.	**10.** Identify easily the technical vocabulary in texts	**297**	3.5993	2.02294
10.	**4.** Guess the meaning of new words from their pronunciation	**297**	3.4916	2.30615
11.	**11.** Identify semi-technical words	**297**	3.3973	2.18650

Guessing from context either in the sentence and/or in the paragraph where the unknown word occurs in technical English texts emerged as the most frequently used guessing strategy that significantly differed from guessing meaning by the topic of the text (< 0.001). In fact, this VLS was ranked first in the ten of the most-used VLS by all ESP learners, sixth in the ten most frequently used strategies reported by Marin (2005) and second in the summary of 'word-attack strategies' reported by Nakamura (2000) in EFL contexts. By contrast, identifying common words with

technical meaning was the least frequently used strategy confirming Katsarou's (2011) findings that illustrate a complete lack of identification skills in advanced Greek EFL learners in a lexical guessing task of unknown English idioms in reading texts. This identification strategy was originally included in our questionnaire, as identification of whether or not a word (e.g., bank) has a special meaning relevant to the ESP learners' academic subject is considered the first step for lexical guessing. Additionally, Guessing meaning by the word's sound was also found to be one of the least frequently used strategies confirming Marin's (2005) results.

CATEGORY 2: Dictionary Use Strategies (Mean = 4.14, SD = 1.220)

RQ 2B: *What is the most frequently used type of dictionary used by ESP learners?*

Hypothesis 2: Bilingual dictionaries are more frequently used by all learners than monolingual dictionaries.
Hypothesis 3: Electronic dictionaries and internet-based dictionaries are the least frequently used vocabulary reference works.

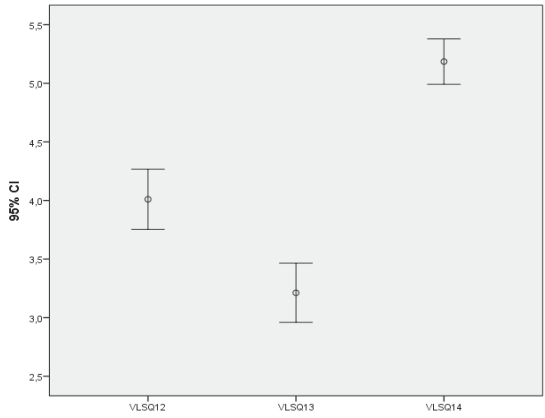
Our focus in this VLS category is on two parameters of dictionary use, i.e., (i) to find out whether there are differences in the use of bilingual, monolingual and online dictionaries and (ii) to identify how frequently ESP learners look up specific types of word information in the dictionary when they resort to it. Table 3.7. below presents the frequency mean rating for each of the eight individual strategies included in this category.

Some relevant differences in dictionary preferences can readily be observed and further corroborated via one-way within-subjects ANOVA, which showed significant differences in the type of dictionaries used by our ESP learners ($F_{(2,592)} = 91.762$, $p < 0.001$). The results showed that bilingual dictionaries are used significantly more than monolingual dictionaries ($p < 0.001$), a finding that is consistent with what Schmitt(1997) found among Japanese learners of English and with Marin (2005) study of VLS use by EFL Mexican undergraduate university students as well as with Tomaszczyk (1979). Nevertheless, the use of an online dictionary is significantly much more used than either types of dictionary (bilingual or monolingual) in print form contradicting Marin's (2005) findings. Figure 3.1. illustrates the differences in dictionary use among ESP learners regardless of the year of study, vocabulary knowledge, gender and learning, style, degree of self-esteem, and self-regulating capacity.

Table 3.7. Summary of the Use of Dictionary Use Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**14.** I use an online dictionary to check the meaning of a word.	**297**	5.1852	1.69739
2.	**15.**Use dictionary to check meaning (s).	**297**	4.7879	1.87231
3.	**17.**Use dictionary to check spelling.	**297**	4.7643	1.85587
4.	**19.** Use dictionary to check how new words are used in sentences.	**297**	4.7003	1.93678
5.	**12.** Look up the new word in a bilingual dictionary	**297**	4.0101	2.24735
6.	**16.** Check the pronunciation of a new word in a dictionary	**297**	3.2559	2.17988
7.	**18.** Check the grammar of new words in a dictionary	**297**	3.2222	2.15084
8.	**13.** Look up new words in a monolingual dictionary	**297**	3.2121	2.20996

Figure 3.1. Use of Dictionaries among all ESP Learners

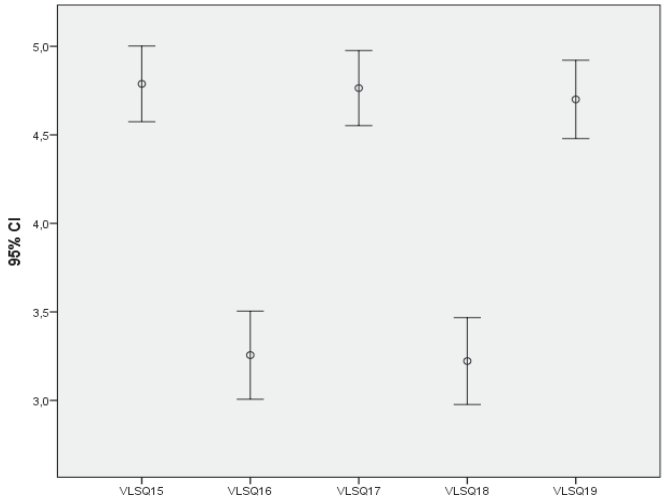


These findings suggest that ESP learners of Agricultural and Forestry Sciences rely heavily on bilingual dictionaries (mean = 4.01) and considerably less on monolingual dictionaries (mean = 3.21) to look up the meaning of unknown technical words in their courses. The finding reveals the low level of language proficiency of these ESP learners upon entrance of the English course at the beginning of their academic studies, which is often followed by a high degree of demotivation to actively participate and enhance their progress in the course. On the other hand, electronic dictionaries were found to be more frequently used than either paper forms of dictionaries (monolingual or bilingual), indicating Greek ESP learners' ease and convenience to use internet-based dictionaries and applications. This finding is also characteristic of Asian learners as reported in Bower and McMillan's (2007) and Collins' (2016) studies, where the use of electronic and internet-based dictionary applications is highly adopted for reasons of speed and ease of use among EFL students at Japanese universities.

RQ3B: *What is the order of frequency with which different kinds of information are looked up in the dictionary?*

In addition to the frequency with which they use different types of dictionaries, the type of information most frequently looked up by ESP learners was also of interest to us. The results of our study indicate that, in order of frequency, learners use dictionaries to check (1) meaning, (2) spelling, (3) pronunciation, (4) examples for proper use of the word and (5) grammar of the word. This finding is more or less consistent with Nakamura (2000) and Marin (2005). Through the one-way within-subjects ANOVA, a significant difference was found in the frequency with which these kinds of information are looked up ($F_{(4,\ 1184)}$ =82.982, $p < 0.001$). Significant differences were detected between (1) and (2), (4) ($p < 0.001$), (2) and (3), (5) ($p < 0.001$), (3) and (4) ($p < 0.001$) and (4) and (5) ($p < 0.001$). It seems that apart from checking a word's meaning, ESP learners tend to use dictionaries to check the spelling of unknown words and learn how to use words properly much more frequently than to look up their pronunciation and grammar (see Figure 3.2. below). Using dictionaries for word meaning, spelling and proper use were also among the first 10 most frequently used strategies for all ESP learners in our study.

Figure 3.2. Types of Word Information Looked up in Dictionaries



CATEGORY 3: Repetition Strategies (Mean = 3.61, SD = 1.100)

RQ 4B: *What type of repetition is most and least frequently used?*

Here we are concerned with two aspects of repetition strategies: (a) modes of repetition and (b) the information handled repeatedly. In terms of (a), Table 3.8. below indicates that learners (1) write down the words many times, (2) silently repeated the words to themselves and (3) say the new words aloud in order to memories them.

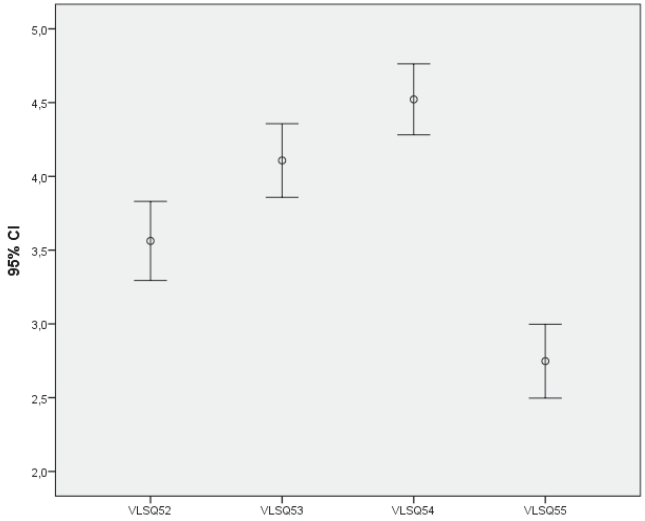
Table 3.8. Summary of the Use of Repetition Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**57.**I repeat new words along with their Greek translations	**297**	4.8148	1.91968
2.	**54.**Memorize words by writing them many times (mode)	**297**	4.5219	2.10863
3.	**53.**Repeat new words silently to myself (mode)	**297**	4.1077	2.18607
4.	**56.**Repeat the new words alone	**297**	3.9966	2.17401
5.	**52.**Repeat new words aloud (mode)	**297**	3.5623	2.34744
6.	**60.** Repeat the spelling of new words many times	**297**	3.0707	2.22054
7.	**59.** Repeat the new words along with their definitions in English	**297**	2.9798	2.20095
8.	**58.** Repeat new words in sentences-examples several times	**297**	2.7710	2.13911
9.	**55.** Listen to the pronunciation of a new word in an online dictionary (mode)	**297**	2.7475	2.19494

One-way within-subjects ANOVA yielded a significant difference among these modes of repetition ($F_{(3,\ 888)} = 39.856$, $p < 0.001$). Using Bonferroni adjustment (Figure 3.3 below), the mean frequency for writing down the words many times was significantly different from saying the new words aloud ($p<0.001$), allowing us to state that strategy 54 is the most frequent mode of repetition for our ESP learners and strategy 55 the least frequently used. Strategy 53, repeating words to myself silently is used at the same relatively high frequency along with strategies 52, repeating new words aloud, and 54, writing new words many times, as there was no significant difference between them (p = n.s.) with an average mean frequency of 4.03. The result contradicts Marin's (2005) and Nakamura's (2000), where the most frequent modes of repetition for word memorization were repeating the word silently and listening to tape-recorded words – a strategy we did not include in our questionnaire as tapes are rarely ever used for educational purposes any more, let alone as an aid to record and learn new vocabulary in a foreign language. On the other hand, it appears that it agrees more or less with results yielded by Ahmed (1988), Schmitt (1997) and Jimenez-Catalan (2003) since verbal

and written repetition emerged as frequently used vocabulary learning strategies.

Figure 3.3. Modes of Repetition by all ESP Learners

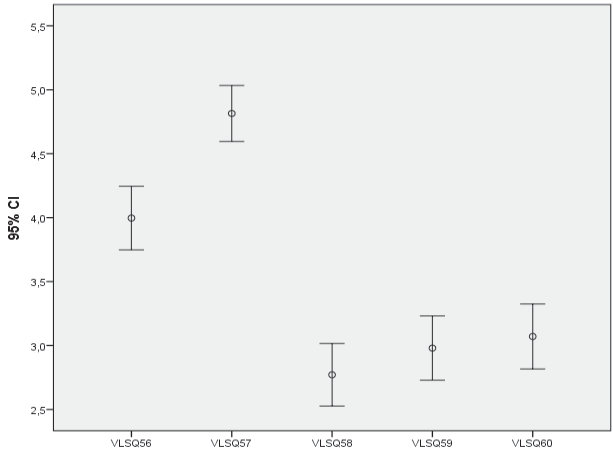


RQ 5B: *What information about new words is most and least handled repeatedly?*

Regarding research question 5B, it was discovered that learners mostly prefer to repeat new words with their L2 translation in Greek (Strategy 57). On the other hand, repeating new words in sentence-examples several times (Strategy 58) appears to be the least frequently used repetition strategy of this type. As can be seen from Figure 3.4. below, strategy 58, with the strategy of repetition of the spelling of the new word (Strategy 59) and repetition of new words along with their English definitions (Strategy 60), are less used by all ESP learners as their similar low mean frequencies show. This finding suggests that ESP learners commonly prefer to memories new technical words along with their L2 translation in Greek alone more than the rest of the repetition strategies considered in our study, considering them the best possible way to learn new technical words in English related to their academic field of study. Our result runs counter to Marin's (2005) and Nakamura's (2000) findings, less explicitly, where a similar trend was observed with EFL university learners reporting

repeating new words in example-sentences with their L1 translation and with their L2 definition with similar frequency.

Figure 3.4. Frequency with which learners repeat information about new words



Again, using Bonferroni adjustment for multiple comparisons, we can confirm that repetition of new words with their L2 translation differed significantly from all other strategies ($F_{(4,1185)} = 59.648$, $p<0.001$). Strategy 56 is relatively frequently used by learners with a mean frequency of approx.4, and a significant difference from all other strategies, while strategies 58, 59 and 60 are all used at a consistently low rate by all learners (p = n.s.). This result indicates that ESP learners do not prefer to focus and repeat the spelling, the usage of the new word in sentences, and L2 definitions as these features presumably do not help them memories and learn new words in technical English.

CATEGORY 4: Social-Discovery Strategies (Mean = 3.47, SD = 1.481)

Four research questions were formulated concerning the use of social-discovery strategies by ESP learners, i.e., (i) the type of person most and least asked, (ii) differences in asking the teachers for L1 translation and English definition, (iii) differences in asking peers for L1 translation and English definition and, (iv) the order of frequency with which learners request different kinds of information. Table 3.9. below summarizes the relevant information about the 9 relevant social-discovery strategies.

Table 3.9. Summary of the Use of Social-Discovery Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**23.**Ask my teacher for the Greek translation of a new word	**297**	4.3434	2.04920
2.	**24.** Ask my teacher for the definition of a new word in English	**297**	4.0505	2.21195
3.	**25.** Ask my teacher for a sentence-example to understand how the new word is used	**297**	3.6195	2.24963
4.	**26.** Ask my teacher for the pronunciation/spelling of the new word	**297**	3.5993	2.16648
5.	**20.** Ask my fellow students for the Greek translation of technical vocabulary	**297**	3.4411	2.24904
6.	**27.** Ask my teacher how I can use a new technical word in speaking/writing	**297**	3.3131	2.20555
7.	**28.** Ask my teacher for the grammar of a new word	**297**	3.2929	2.22358
8.	**21.** Ask me fellow students for an English definition of the new word	**297**	2.8418	2.14000
9.	**22.** Ask my fellow students for the spelling/pronunciation of the new word	**297**	2.8047	2.20156

RQ6B: *Who is the most and least frequently asked person for information about new words?*

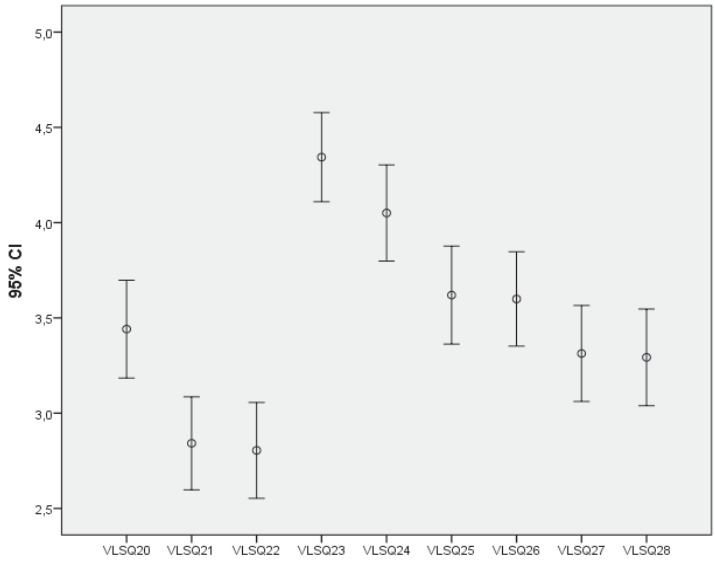
The teacher seems to be the most frequently asked person followed by classmates. In order to statistically compare the two types of people being asked, we averaged the different strategies into two variables with frequency mean ratings for each person type, 3.70 for teachers and 3.02 for fellow students, and compared them via one-way within-subjects ANOVA, yielding a significant difference ($F_{(1, 296)} = 27.635$, $p < 0.001$). This finding is consistent with Marin (2005) but not Ahmed (1988), Schmitt (1997), and Nakamura (2000), where learners appear to ask other

learners more often than teachers. Marin (2005) attributes this difference in research findings to cultural differences as Japanese learners consider interrupting teachers during the lesson as disrespectful.

RQ7B: *What is the most frequent kind of information they ask for and from whom?*

Now we focus on the frequency with which learners ask teachers and learners for word information as well as the most frequent kind of information they ask when they resort to either their teacher's or their classmates' for help. Figure 3.5. shows the different mean frequency ratings for all strategies in this category.

Figure 3.5. Frequency with which learners ask teachers and classmates



One-way within-subjects ANOVA indicated that there were significant differences among the self-reported uses of these VLS $F_{(8, 2368)} = 25.823$, $p < 0.001$). Using the Bonferroni adjustment for multiple comparisons, it was found that learners turned significantly more often to their teacher than their classmates ($p<0.001$), and when this happened, it was primarily to provide them with the Greek translation of the new technical word they did not know. This finding is also in line with one of Marin's (2005) key

findings for this category. This result is not surprising since ESP learners seem to rely on and trust their teacher more than their classmates to receive the correct information about the words they do not know. In addition, the English definition of the unknown technical word was found to be the second type of information most frequently asked from their teacher ($p<0.001$) rather than from their classmates. The results partially contradict findings from other relevant studies as Marin's (2005), whose findings yielded no significant differences between when asking the teacher for L1 translation and L2 definition as well as between asking learners and teachers for L1 translation – a result which is also consistent with Nakamura (2000).

RQ8B: *What is the order of frequency with which different kinds of information about new words are requested?*

Regarding the order of frequency of other information requested irrespective of the person who is asked to provide help, the results show (1) Greek translation, mean = 3.892; (2) a sentence-example for the new word, mean = 3.620; (3) definition of the new word in English, mean = 3,446; (4) asking for the proper use of the new word, mean = 3.313; (5) asking for the grammar of the word, mean = 3.293, and (6) pronunciation/spelling, mean = 3.202. The significant differences observed among different types of word information requested by the ESP learners were confirmed by one-way within-subjects ANOVA ($F_{(5,1480)} = 10.559$, $p<0.001$), and specific differences were found after performing the Bonferroni multiple comparisons adjustment. Learners seemed to be much more interested in knowing the Greek translation of the unknown English word more than any other kind of information ($p<0.001$). They are also interested in sentence-examples of the new word much more than knowing its pronunciation and spelling ($p<.005$), which is one of the last things they would ask a teacher or classmate to know as spelling and pronunciation are frequently looked up in the dictionary after word meaning (see above). This finding contrasts with Marin's (2005), where it was found that EFL learners were primarily interested in word use, the written form (spelling) and pronunciation, L1 definitions, and L2 translations provided by the teacher in this order with ratings above the midpoint of his 6-point VLS-Q scale.

CATEGORY 5: Note-taking Strategies (Mean = 3.24, SD = 1.006)

As a category, note-taking strategies were found to be one of the least frequently used VLS strategies, ranking 5th place out of the total of 7 VLS strategy groups included in this study. Nevertheless, as it will become apparent, specific individual note-taking strategies were, in fact, widely used by learners of our sample and prominently figured at the top places of the 10 most frequently used. Table 3.10. below presents 22 note-taking strategies arranged in ranking order, in fact, the largest VLS category in our questionnaire addresses three aspects of note-taking (1) the place where vocabulary notes are kept, (ii) the different kinds of vocabulary information ESP learners takedown and, finally (3) how they organize their vocabulary notes. For ease of reference, a description of every strategy in this category is given in brackets. For example, the most often used strategy in this category is writing down L1 translation (information type), and the least frequently used strategy is classifying words by their grammatical category (organization). In this light, out of the total 21 note-taking strategies, 10 strategies refer to the type of vocabulary information noted, 6 strategies refer to the way learners organize the vocabulary they usually write down in their classes and 6 strategies are about the place ESP learners prefer taking down vocabulary notes.

Table 3.10. Summary of the Use of Note Taking Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**36.** I write down the Greek translation of a technical word. (information type)	**297**	5.2458	1.60558
2.	**29.**I keep notes of the new vocabulary in every class session. (organization)	**297**	4.8754	1.78620
3.	**31.**Keep vocabulary notes in a specific textbook just for this purpose (place)	**297**	4.6465	2.03340
4.	**51.**Use different ways to highlight important new words (organization)	**297**	4.4242	2.17366
5.	**46.**Keep vocabulary notes based on units or class sessions (organization)	**297**	4.2222	2.19746
6.	**39.**Keep notes of multiple meanings of new words (information type)	**297**	4.1448	2.16606
7.	**30.**Keep vocabulary notes on the margins of my book (place)	**297**	4.0943	2.18669
8.	**50.**Keep notes of the new words in every text I meet them (place)	**297**	3.9428	2.19184

9.	**37.**Keep notes of the new words along with their definitions in English (information type)	**297**	3.7946	2.22127
10.	**32.** Keep notes of new technical words in a specific section in my notebook (place)	**297**	3.2963	2.30300
11.	**38.** Keep notes of antonyms/synonyms of new words. (information type)	**297**	2.9394	2.20174
12.	**45.** Keep notes of where I have met the new word (place)	**297**	2.8721	2.22481
13.	**43.**Keep notes of the syntax of new words (information type)	**297**	3.3603	2.24545
14.	**44.**Keep notes of how new words can be used correctly (information type)	**297**	2.6532	2.04781
15.	**40.** Keep notes of new words in sentences-examples (information type)	**297**	2.6364	2.07684
16.	**35.** Keep vocabulary notes on an electronic device (place)	**297**	2.4074	2.04651
17.	**42.** Keep notes of the grammatical category of new words (information type)	**297**	2.3266	1.93590
18.	**41.** Keep notes of the pronunciation of new words (information type)	**297**	2.3030	1.90015
19.	**48.** Classify new words based on topics when keeping notes (organization)	**297**	2.2189	1.92492
20.	**49.** Keep notes of the new words alphabetically (organization)	**297**	1.8788	1.71799
21.	**47.** Classify new words based on their grammatical category when keeping notes (organization)	**297**	1.8586	1.69863

RQ9B: *What is the most and least frequent place for keeping a note of new words?*

A simple look at table 3.10. above reveals that the commonest place where ESP learners prefer to take notes of their new vocabulary is in a notebook specifically used for this purpose (strategy 31) only, while the least frequent place is keeping vocabulary notes on an electronic device (strategy 35). This finding partially contradicts Marin's (2005) and Nakamura's (2000) results as their EFL learners were found to take vocabulary notes in their textbooks. Mean scores for the six note-taking strategies for place were analyzed and found a significant difference ($F_{(5,1480)} = 54.764$, $p<0.001$).On performing the Bonferroni adjustment, we found (i) a significant difference between strategies 31 and 30 ($p<0.004$), (ii) no significant difference between keeping notes of new words (strategy 32) in a specific section of a notebook and keeping vocabulary notes

where learners meta new vocabulary (strategy 45), as the mean frequency of use for these two strategies is around 3 on our 6-point continuous scale indicating their moderate use of both strategies by our ESP learners and (iii) a significant difference between strategies 32 and 50 with ESP learners preferring to keep vocabulary notes next to the text where they meet them rather than in a specific section of a general-use notebook. ($p<0.002$). The results are partially consistent with Marin's (2005), Nakamura's (2000) and Jimenez Catalan's (2003) findings, where keeping a vocabulary notebook and writing down new vocabulary on a separate section of the English notebook have also been used by EFL learners. Unfortunately, Schmitt (1997) did not include using vocabulary notebooks in his survey, though he did so in his taxonomy.

RQ10B: *What is the order of frequency with which different kinds of information about new words are written down?*

As to the order of frequency with which different kinds of information about new words are kept, the results revealed that ESP learners take notes of (1) L1 translation, (2) multiple meanings of new words, (3) L2 definitions, (4) antonyms/synonyms of new words, (5) syntax of the new words, (6) contextual/situational use, (7) sentence-examples, (8) grammatical category and (9) pronunciation (see Table 3.10 above). Again, we found a significant difference among these 9 VLS ($F_{(8, 2368)} = 94.040$, $p<0.001$). Using Bonferroni adjustment for multiple comparisons, we found no significant differences (1) between keeping notes of L2 definitions (strategy 37), keeping notes of antonyms/synonyms (strategy 38), and keeping notes of the syntax of new words (strategy 43) (p =n.s.), indicating that they are moderately used by the learners (average mean = 3.36). (2) among keeping notes of the grammatical category of the new word (strategy 41), its pronunciation (strategy 42), contextual/situation use of the word (strategy 44), and keeping notes of example-sentences (strategy 40), showing that they are the least frequent recorded word information (average mean = 2.47). Thus, it is confirmed that the kinds of information most frequently written down are 1 followed by 2 and 3 that are used more or less at the same rate as there was found no significant difference between them (p= n.s.). Nakamura (2000) also found that writing down new words plus L1 translation was the most frequent type of information recorded by his Japanese learners and more often used than writing down information in L2, while in Marin's results (2005), L2 translation and L2 definition are both the most frequently recorded word information by his EFL Mexican learners, corroborating with our results

here. Generally, learners app appeared to be concerned far more about word meaning, taking notes of L1 translation, L2 definitions and other meanings of the new word than its form, use and grammar.

RQ 11B: *What is the most and least frequent way of organizing notes about new words?*

In terms of ways of organizing notes and in ranking order, we found that learners (1) keep vocabulary notes after every class session, (2) highlight new words, (3) keep vocabulary notes based on the book units and (4) take notes of new words alphabetically. As expected, a significant difference was observed within these modes of organizing vocabulary notes ($F_{(3, 888)} = 173.207$, $p < 0.001$). Clearly, taking notes after every class session is prominently the most frequently used manner of organizing words for our ESP learners, while alphabetical word organization is the least frequent way they use. On the other hand, highlighting new words and organizing new vocabulary per textbook unit are equally highly used (average mean = 4.23) as no significant difference arose between these two strategies (p = n.s.). Our results agree only partially with Nakamura's (2000) and Marin's (2005) in that the least frequent note-taking strategy is writing words alphabetically. Their most frequently used strategy in both studies for vocabulary notes organization was highlighting new words as they appear, which in our case comes second in order of frequency of use.

CATEGORY 6: Association Strategies (Mean = 3.21, SD = 1.232)

RQ12B: *What type of association is most frequently used?*
Hypothesis 1:
The Keyword Method is the least-frequently used association strategy.

Our interest here is to find the most frequently used association strategy and, later on, see if the Keyword method is infrequently used by the whole sample. Table 3.11. presents the 10 association strategies included in our questionnaire in the ranking order of mean frequency ratings, ranging from 2.63 to 4.23 and, therefore, an overall significant difference was observed ($F_{(9, 2664)} = 26.586$, $p<0.001$). We find no significant difference between the first two strategies, i.e., strategy 68, memorise the spelling of new words, and strategy 64, associating new words to formally similar words in Greek. These two strategies together were found to be the most frequently used strategies than any other strategy of this category as we found a significant difference between

these two strategies and any other association strategies($p<0.001$). On the other hand, strategy 65, using the Keyword Method was found to be amongst the least frequently used association strategies by ESP learners in our study alongside strategy 61 (association of the spelling of new words with other English words of similar sound or spelling), strategy 62 (association of new words with their synonyms/antonyms), strategy 63 (associating new words in English with similar words in another foreign language) as in Marin (2005) and strategy 70 (thinking of prefixes/suffixes that could be added to the new word) with an average frequency of use of 2.84 since no statistically significant differences were found among these strategies (p = n.s.).

Table 3.11. Summary of the Use of Association Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**68.** Memorize the spelling of new words	**297**	4.2391	2.09248
2.	**64.**I associate new words to similar words in Greek	**297**	4.1010	2.14111
3.	**69.** Associate new technical words with the location where I see them	**297**	3.4343	2.27276
4.	**67.** Associate new words with others in a semantic set	**297**	3.2222	2.19438
5.	**62.**Associate new words with their synonyms/antonyms.	**297**	3.1313	2.17936
6.	**66.**Associate new words with their collocations	**297**	3.1178	2.14577
7.	**70.** Think of prefixes/suffixes can be added to the new word	**297**	2.8485	2.19350
8.	**63.** Associate new words in English with formally (similar) words in another foreign language	**297**	2.7845	2.20274
9.	**65.** I use the Keyword method	**297**	2.6532	2.21427
10.	**61.** Associate the spelling of new words with other words of similar sound or spelling	**297**	2.6330	2.10292

The Keyword Method was also found to be the least frequently-used association strategy by Marin (2005). Our findings about the most often used association strategies are partly in line with Marin's (2005, 211) and Nakamura's (2000, 150), who both report that association of English words to similar L1 words and association of a word with contextual/situationaluse (our strategy 69) were the most frequently used association/memorization strategies in their studies with EFL learners. Similarly, in Ahmed (1988), "pairing a word with some aide memoire" (e.g., cognates) was widely reported, a fact which is consistent with the strategy of associating a new word with a similar L1 word. Schmitt (1997) also reported that Japanese learners of English considered the Keyword Method among the least helpful strategies, reflecting a low frequency of use. Hence, it can be suggested that ESP learners pay much attention to the written form of the new word and use this as the primary strategy to facilitate their memorization. Other association strategies rated around the midpoint of the scale include strategy 66, associating new words with their collocations, strategy 67, associating new words with others in semantic sets, and strategy 69, associating new words with the context where they are encountered.

CATEGORY 7: Consolidation Strategies (Mean = 2.56, SD = 1.295)

RQ 13B: *What type of further-consolidation strategies are most and least frequently used?*

Further-consolidation strategies cover all those actions or activities that learners engage in to consolidate new vocabulary items. Again, our concern here is to find out the most and least popular strategy reported by the whole sample. Table 3.12. shows that this category included five strategies in our adapted questionnaire whose mean frequency ratings range between 1.66 and 3.45. One-way within-subjects ANOVA yielded a significant difference within this category ($F_{(4,\ 1184)} = 60.641$, $p<0.001$). Additionally, the Bonferroni adjustment for multiple comparisons confirmed valid significant differences among the five strategies.

Table 3.12. Summary of the Use of Consolidation Strategies by all ESP Learners

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**74.**Watch English documentaries to enrich my technical vocabulary knowledge	**297**	3.4579	2.32911
2.	**75.** Attend speeches/lectures in English to enrich my technical vocabulary knowledge	**297**	3.2424	2.25003
3.	**71.** Test myself or have others test my vocabulary knowledge	**297**	2.4646	2.05981
4.	**73.** Search for more scientific texts to expand my vocabulary knowledge	**297**	1.9764	1.78851
5.	**72.** Write summaries using the new words.	**297**	1.6667	1.52014

Hence, it was found that watching documentaries related to the topic of their studies to enrich their knowledge of technical vocabulary in English and attending speeches/lectures in English were the most frequently used further-consolidation strategy that differed significantly from the other four ($p<0.001$). On the other hand, searching for more scientific texts to expand their vocabulary knowledge and writing summaries using the new words were the two least frequently used strategies in this group as no significant difference between them was found (p = n.s.). In fact, these two strategies were cited at the bottom of the overall ranking of VLS in terms of frequency of use for our ESP learners in this study. In contrast to earlier studies such as Marin's (2005), who found that his EFL learners tried to incorporate new words into conversations and writing and Ahmed (1988), who found that 50% of his subjects reported using newly-learned words in real situations ("practice" strategy category), our results indicate that this strategy is not particularly preferred by ESP learners who, overall seem to infrequently resort to further consolidation strategies to master the meaning and use of new academic, technical and semi-technical words. The strategy of testing themselves or asking others to test them was also one of the least frequently used further-consolidation strategies(below the midpoint of the scale) possibly because learners associate testing with taking vocabulary tests for assessment in the strictest sense. This finding is

in line with Marin's (2005) result and Stoffer's (1995), who considered this strategy of medium use (mean = 3.25/5). Ahmed (1988), on the other hand, found that 49% of his subjects claimed to quiz themselves.

In summary, our ESP learners in this study seem to use limited use of various L2 vocabulary learning strategies as reflected across six different levels of the scale of the questionnaire. Only 5 strategies obtained mean frequency ratings below, 2 ("never or almost never true of me"), while 25 VLS were rated between 4 and 5 ("sometimes of generally true of me"). 40 out of the total 75 VLS strategies obtained scores above the midpoint of the scale (i.e., 30%). This may suggest that limited use of VLS strategy on the part of ESP learners can be attributed to lack of interest and appropriate level of motivation towards the course of English language for Specific Purposes in the context of the university they attend.

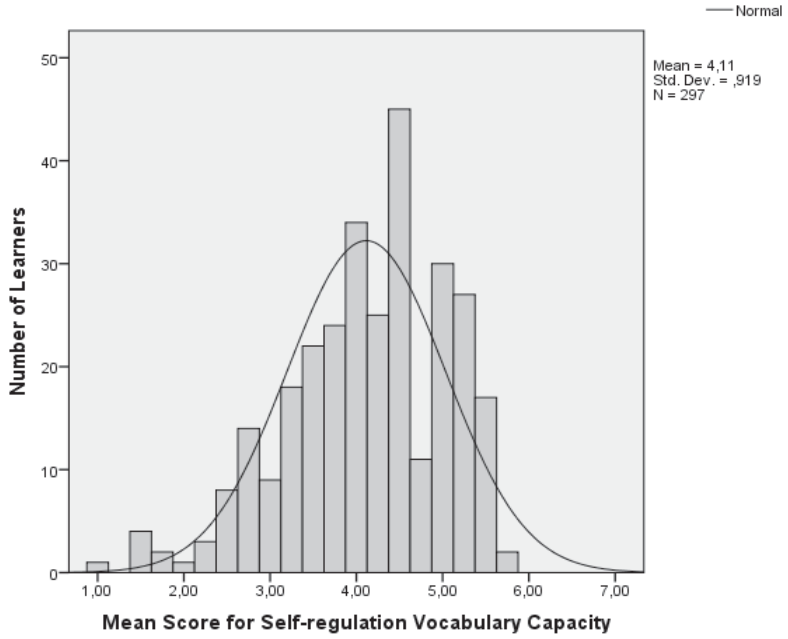
3.10. Self-Regulation, Gender, Vocabulary Knowledge and Use of VLS

3.10.1. Self-regulation and Gender

RQ1C: *Is there a relationship between the self-regulation capacity ESP learners exhibit and gender?*

Figure 3.6. shows self-regulation scores for the total sample of 297 ESP learners. As it can be observed, the distribution of responses provided by subjects to the self-regulation capacity questionnaire appears varied with more answers being heaped in the middle of the scale (SD = 0.919) exhibiting a moderately low self-regulation vocabulary capacity overall. This is also reflected by the moderate average of 4.11 on our seven-point bar that corresponds to the Likert scale used in the original instrument ranging from 1-strongly disagree to 7-strongly agree, revealing that learners in our sample seem to possess an adequate, yet insufficient amount of self-regulatory skills to monitor and control the vocabulary acquisition process of English terminology in their ESP classes.

Figure 3.6. Mean Score of Self-regulation Vocabulary Capacity in the Sample



More importantly, we found no significant differences between males (mean = 4.09) and females (mean = 4.13) with respect to self-regulation vocabulary capacity (t = -0.373, df = 295, p = n.s.). This result agrees with Vujnovic (2017), where self-regulation capacity in vocabulary learning among EFL learners was not significantly different between male and female learners and also with Fatemipour and Najafgholikhan's (2015) results that revealed a significant positive impact of self-regulated strategies on the vocabulary learning of Iranian intermediate EFL learners irrespective of gender. Equally, no gender differences were found with respect to each of the five self-regulation capacity aspects as shown in Table 3.13. below.

Table 3.13. Independent T-test Results for Gender Differences for SRC (voc) Sub-components

	Mean Male	Mean Female	t	df	p
Commitment Control	4.55	4.64	-.638	295	n.s.
Metacognitive Control	4.19	4.17	.175	295	n.s.
Satiation Control	3.23	3.26	.212	295	n.s.
Emotion Control	3.74	3.84	.759	295	n.s.
Environment Control	4.73	4.74	-.054	295	n.s.

3.10.2. Self-regulation and Vocabulary Knowledge

RQ2C: *Is there is a relationship between the self-regulation capacity ESP learners exhibit and their English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?*

The relationship between learners' self-regulation capacity in vocabulary learning and their vocabulary size scores was investigated using the Pearson's product-moment correlation coefficient. The results indicate that there is no significant relationship between the two variables, r=-.008, p=.895. Likewise, results indicated in Table 3.14. below show that there are no significant relationship between individual self-regulation capacity facets and vocabulary size score. This finding is in line with Vujnovic's (2017) and Zarei and Hatami's (2012), which found no significant relationship between self-regulated components and their participants' vocabulary knowledge. This was contrary to previous studies by Mizumoto (2013), Fatemipour and Najafgholikhan (2015), and Araya et al. (2013) that pointed the provision of self-regulatory training to learners and making them aware of it is the foundation for vocabulary learning.

Table 3.14. Pearson Correlation Results for Learners' Vocabulary knowledge and SRC (voc) Sub-components

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Vocabulary Knowledge	0.964	0.195	0.383	0.406	0.545

3.10.3. Self-Regulation and the Use of VLS: Overall and In Categories

Relevant research on self-regulation and vocabulary learning in a foreign language revealed several mixed results with respect to the relationship between self-regulated learning competence and vocabulary knowledge that focus on the importance of the self-regulated learning approach in EFL teaching contexts. Such findings lead us to explore potential relationships of self-regulation capacity with VLS in the form of the research questions as summarized in 3.2. In what follows then, we present the results and discussion concerning the relationship between self-regulation capacity and overall use of VLS (RQ1D); self-regulation capacity and use of VLS in categories (RQ2D to RQ8D); and self-regulation capacity and of individual VLS (RQ9D to RQ15D). For reasons of space and avoiding, we will be focusing on the significant relationships when presenting results for separate VLS.

RQ1D: *Is there a relationship between self-regulation capacity ESP learners exhibit and vocabulary learning strategies overall and in categories?*

To explore the relationship between self-regulation capacity and the overall use of VLS, we correlated ESP learners' self-regulation capacity scores with their mean scores for VLS use over the seventy-five strategies. Pearson r correlations did not yield any significant relationship between overall VLS use and self-regulatory vocabulary capacity (r =-.010, p = .863) or any of its separate facets, i.e., commitment control, metacognitive control, satiation control emotion, and environment control, as shown in Table 3.15. below.

Table 3.15. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Overall VLS Use

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Overall VLS use	0.867	0.765	0.328	0.831	0.579

Similarly, self-regulation vocabulary capacity was not found to correlate with any of the VLS categories in our study, as displayed in what follows. The categories of lexical guessing strategies (r = -0.33, p =.573), dictionary use (r = .005, p=.931), social-discovery (r=-.001, p=990), note-taking (r = -.006, p=.922), repetition (r=-.001, p=.980), association (r=.016, p=779) and consolidation (r=-.080, p=.170) were not significantly correlated with ESP learners' self-reported self-regulation vocabulary capacity skills.

RQ2D: *Is there a relationship between self-regulation capacity ESP learners exhibit and the use of guessing strategies as a category?*

No significant relationship emerged between an individual's self-regulation capacity overall and lexical guessing strategies as a category (r = -0.33, p =.573). There was also no significant relationship between any of the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.16. below.

Table 3.16. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Lexical Guessing Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Lexical Guessing Strategies	0.510	0.636	0.775	0.541	0.922

RQ3D: *Is there a relationship between self-regulation capacity ESP learners exhibit and the use of dictionary use strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and dictionary use strategies as a category (r = 0.05, p =.931). There was also no significant relationship between any of

the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.17. below.

Table 3.17. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Dictionary Use Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Dictionary Use Strategies	0.823	0.269	0.984	0.193	0.612

RQ4D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and the use of social-discovery strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and social-discovery strategies as a category (r = -.001, p =.990). There was also no significant relationship between any of the self-regulatory capacity subcomponents and the category of lexical guessing strategies, as illustrated in table 3.18. below.

Table 3.18. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Social-Discovery Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Social-Discovery Strategies	0.780	0.734	0.480	0.859	0.284

RQ5D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and the use of note-taking strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and note-taking strategies as a category (r = -.006, p =.922). There was also no significant relationship between any of the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.19. below.

Table 3.19. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Note-taking Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Note-taking Strategies	0.589	0.672	0.217	0.770	0.648

RQ6D: *Is there a relationship between self-regulation capacity ESP learners exhibit and the use of repetition strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and repetition strategies as a category (r = -.001, p =.980). There was also no significant relationship between any of the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.20. below.

Table 3.20. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Repetition Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Repetition Strategies	0.721	0.469	0.370	0.818	0.863

RQ7D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and the use of association strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and association strategies as a category (r = .016, p =.779). There was also no significant relationship between any of the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.21. below.

Table 3.21. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Association Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Association Strategies	0.984	0.694	0.711	0.399	0.884

RQ8D: *Is there a relationship between self-regulation capacity ESP learners exhibit and use of consolidation strategies as a category?*

No significant relationship emerged between the individual self-regulation capacity overall and consolidation strategies as a category (r = -.080, p =.170). There was also no significant relationship between any of the self-regulatory capacity facets and the category of lexical guessing strategies, as illustrated in table 3.22. below.

Table 3.22. Pearson Correlation Results for Learners' SRC (voc) Sub-Components and Consolidation Strategies as a Category.

	Commitment Control	Metacognitive Control	Satiation Control	Emotion Control	Environment Control
Consolidation Strategies	0.107	0.104	0.401	0.714	0.543

3.10.4 Self-Regulation Vocabulary Capacity and Use of Individual VLS

A stepwise multiple regression analysis was performed to determine which sub-components of self-regulating capacity in vocabulary learning most strongly correlated with individual VLS use. Overall mean scores of self-regulating capacity in vocabulary learning, commitment control, satiation control, meta-cognitive control, emotion and environment control were specified as predictor variables, with VLS use as the criterion variable. As already seen above, the analysis yielded no significant relationships between overall self-regulating capacity and overall VLS use ($F_{(1)}$ =.011, p=n.s.), and between self-regulating capacity and use of VLS per category for Greek ESP learners ($F_{(7)}$ =.040, p=n.s.), indicating that self-regulating capacity is not a strong determinant of either the overall VLS use or VLS use per category. However, several significant

relationships were found between sub-components of self-regulation capacity and separate VLS use.

RQ9D: *Is there a relationship between the self-regulation ESP learners exhibit and any individual guessing strategy?*

Overall, none of the eleven lexical guessing strategies under examination in this study was found to be significantly related to ESP learners' self-reported self-regulation vocabulary capacity as a construct. However, separate components of self-regulation vocabulary capacity significantly correlated with three lexical guessing strategies differently. More specifically, a significantly strong but negative correlation was found between the guessing strategy #1 of "checking a new work against the Greek for formal similarity" and the sub-component of satiation control ($F_{(1, 295)}$ =8.158, p <0.005) with an R^2 of 0.027. The second lexical strategy #5 "looking at pictures in the text to help in guessing the meaning of new words" was found to significantly and positively correlate with the subcomponent of self-regulation vocabulary capacity of commitment control ($F_{(1,295)}$ =4.854, p <0.028) with an R^2 of 0.016. Finally, lexical guessing strategy #10 "easy identification of the technical vocabulary in texts" was found to correlate significantly but negatively with the subcomponent of commitment control ($F_{(1, 295)}$ =4.109, p <0.044) with an R^2 of 0.014 (see Table 3.23. below).

Table 3.23. Stepwise Multiple Regression Results for Lexical Guessing Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Satiation Control						
LG Strategy #1	0.164	0.027	0.024	0.027	-0.164	0.005	8.158
	Predictor Variable: Commitment Control						
LG Strategy #5	0.127	0.016	0.013	0.016	0.127	0.028	4.854
	Predictor Variable: Commitment Control						
LG Strategy #10	0.117	0.014	0.010	0.014	-0.117	0.044	4.109

RQ10D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual dictionary use strategy?*

Overall, none of the seven dictionary use strategies under examination in this study was found to be significantly related to ESP learners' self-reported self-regulation vocabulary capacity as a construct. According to table 3.24, only one statistically significant but negative correlation was found between the dictionary use strategy #12 of "looking up a new word in a bilingual dictionary", the subcomponent of self-regulation vocabulary capacity of metacognitive control ($F_{(1,295)} = 4.241$, $p < 0.042$) with an R^2 of 0.011. The same strategy was also found to correlate strongly and positively with the subcomponent of Emotion Control ($F_{(1,295)} = 4.241$, $p < 0.015$) with an R^2 of 0.011. Together both sub-components account for 42% of the variation in this dictionary use strategy.

Table 3.24. Stepwise Multiple Regression Results for Dictionary Use Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Metacognitive Control						
DU Strategy #12	0.118	0.14	0.011	0.014	-0.118	0.042	
	Predictor Variable: Emotion Control						
	0.167	0.28	0.021	0.014	0.136	0.015	4.241

RQ11D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual social-discovery strategy?*

None of the nine social-discovery strategies under examination in this study was found to be significantly related to ESP learners' self-reported self-regulation vocabulary capacity as a construct. Only one negative but significant correlation was found between the social-discovery strategy #22 of "asking my fellow students for the spelling/pronunciation of the new word" and the sub-component of self-regulation vocabulary capacity of emotion control ($F_{(1,295)} = 3.924$, $p < 0.049$) with an R^2 of 0.13 (see table 3.25. below).

Table 3.25. Stepwise Multiple Regression Results for Social Discovery Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Emotion Control						
SC Strategy #22	0.115	0.13	0.010	0.013	-0.115	0.049	3.924

RQ12D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual note-taking strategy?*

Out of 22 note-taking strategies investigated in this study, only 4 significantly correlated with self-regulating vocabulary capacity or with one or more of its sub-components. Following table 3.26, a significantly strong and positive correlation was found between the organizational note-taking strategy #29 of "taking down new vocabulary in every class session" and the subcomponent of self-regulating vocabulary capacity of commitment control ($F_{(1,295)}$ = .7.594, p<0.006) with an R^2 of .025. Strategy #30 of "keeping vocabulary notes on the margins of notebooks" was found to be positively correlated with the commitment control subcomponent ($F_{(1, 295)}$ = 4.139, p<0.038) with an R^2 of .014 and with the satiation control subcomponent ($F_{(1, 295)}$ = 4.139, p<0.017) with an R^2 of .0.27 but only in a negative way. Both components account for 41% of the variation in the use of this strategy. The note-taking strategy #36 of "taking down the Greek translation of a new technical word" was equally found to correlate significantly and positively with the environment control component of self-regulating vocabulary capacity ($F_{(1, 295)}$ = 4.013, p< 0.046) with an R^2 of .013. Finally, strategy #47 of "classification of new words based on their grammatical category" was significantly found to be related with meta-cognitive control ($F_{(1, 295)}$ = 10.472, p<0.001) with an R^2 of .034 but in a negative way.

Table 3.26. Stepwise Multiple Regression Results for Note Taking Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Commitment Control						
NT Strategy #29	0.158	0.025	0.022	0.025	0.158	0.006	7.594
	Predictor Variable: Commitment Control						
NT Strategy #30	0.120	0.014	0.011	0.014	0.120	0.038	
	Predictor Variable: Satiation Control						
	0.165	0.027	0.021	0.013	-0.125	0.017	4.139
	Predictor Variable: Environment Control						
NT Strategy #36	0.116	0.013	0.010	0.013	0.116	0.046	4.013
	Predictor Variable: Metacognitive Control						
NT Strategy #47	0.185	0.034	0.031	0.034	-0.185	0.001	10.472

RQ13D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual repetition strategy?*

A multiple stepwise regression analysis was run to predict the use of individual repetition strategies in vocabulary learning from self-regulating subcomponents. Overall, the variance showed that none of the nine repetition vocabulary learning strategies could be predicted by either of SRC (voc) components in a statistically significant way, as table 3.27. below demonstrates.

Table 3.27. Stepwise Multiple Regression Analysis Results for Repetition Strategies

Vocabulary Learning Strategy for Repetition	Multiple Regression Result
VLS#52: Repeating new words aloud. (mode)	$F_{(5,291)}$= .127, p<0.986
VLS#53: Repeating new words silently to myself. (mode)	$F_{(5,291)}$= 1.459, p<0.206
VLS#54: Memorizing words by writing them many times. (mode)	$F_{(5,291)}$ = .776, p<0.568
VLS#55: Listening to the pronunciation of a new word in an online dictionary. (mode)	$F_{(5,291)}$ = 1.793, p<0.114
VLS#56: Repeating new words alone.	$F_{(5,291)}$ = .723, p<0.607
VLS#57: Repeating new words along with their Greek translations.	$F_{(5,291)}$ = .507, p<0.771
VLS#58: Repeating new words in sentences-examples several times.	$F_{(5,291)}$ = .817, p<0.539
VLS#59: Repeating new words along with their definitions in English.	$F_{(5,291)}$ = 1.310, p<0.260
VLS#60: Repeating the spelling of new words many times.	$F_{(5,291)}$ = 2.414, p<0.036

RQ14D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual association strategy?*

Out of the 10 association strategies investigated in this study, only the strategy of "associating new technical words with the location they are found" (strategy #69 was found to negatively but significantly correlate with the sub-component of self-regulating vocabulary capacity control of satiation control ($F_{(1, 295)}$ = 4.139, p<0.046) with an R^2 of .013 (see Table 3.28 below). The same strategy was also found to correlate significantly and in a positive way with the commitment control subcomponent of self-regulation capacity ($F_{(1, 295)}$ = 4.139, p<0.016) with an R^2 of .028. Together the two subcomponents of self-regulation account for 41% of the variation in the use of this strategy.

Table 3.28. Stepwise Multiple Regression Analysis Results for Association Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Satiation Control						
Ass Strategy #69	0.116	0.013	0.010	0.013	-0.116	0.046	
	Predictor Variable: Commitment Control						
	0.166	0.028	0.021	0.014	0.131	0.016	4.139

RQ15D: *Is there a relationship between the self-regulation capacity ESP learners exhibit and any individual consolidation strategy?*

Two more significant but negative correlations were found in the category of consolidation strategies. "Searching for more scientific texts to expand my vocabulary knowledge" was found to negatively correlate with satiation control ($F_{(1, 295)} = 5.520$, $p<0.019$) with an R^2 of .018. On the other hand, "watching English documentaries to enrich my technical vocabulary knowledge" as a consolidation was found to significantly but negatively correlate with the meta-cognitive control sub-component of self-regulating vocabulary capacity concept ($F_{(1, 295)} = 4.376$, $p<0.050$) with an R^2 of .013 as well as with overall self-regulation capacity ($F_{(1, 295)} = 4.376$, $p<0.013$) (see table 3.29 below). Together meta-cognitive control and overall self-regulation capacity account for 42% of the variation in the use of this strategy.

Table 3.29. Stepwise Multiple Regression Analysis Results for Consolidation Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Satiation Control						
Consolidation Strategy #73	0.136	0.018	0.015	0.018	-0.136	0.019	5.520
	Predictor Variable: Metacognitive Control						
Consolidation Strategy #74	0.114	0.013	0.010	0.013	-0.114	0.050	
	Predictor Variable: Self-Regulation Capacity Overall						
	0.170	0.029	0.022	0.016	-0.125	0.013	4.376

Overall, the use of only 12 vocabulary learning strategies from six VLS groups was found to be significantly related to different self-regulating vocabulary capacity sub-components. More specifically, commitment control was found to strongly and positively correlate with lexical guessing strategy #5 ($_{F\,(1,\,295)} = 4.852$, $p< 0.028$) but negatively with strategy #10 ($F_{(1,\,295)} = 4.109$, $p< 0.044$). It was also found to be positively related to using note-taking strategy #29 ($F_{(1,\,295)} = 7.594$, $p< 0.006$). Satiation control was significantly but negatively correlated with one lexical strategy (strategy #1) ($F_{(1,\,295)} = 8.158$, $p< 0.005$) as well as with one consolidation strategy (strategy #73) ($F_{(1,\,295)} = 5.520$, $p< 0.019$). Meta-cognitive control was found to negatively and strongly correlate with the note-taking strategy #47 ($F_{(1,\,295)} = 10.472$, $p< 0.001$), while emotion control was also found to be significantly but negatively related to the use of note-keeping strategy #22. Finally, environment control was found to correlate significantly positively with the note-keeping strategy #36 ($F_{(1,\,295)} = 4.013$, $p< 0.046$).

Interestingly, the use of four strategies was found to be affected by more than one self-regulating sub-components. The dictionary use strategy #12 was found to be significantly and positively correlated with emotion ($F_{(1,\,295)} = 4.241$, $p< 0.015$) and negatively correlated with meta-cognitive control ($F_{(1,\,295)} = 4.241$, $p< 0.042$), together accounting for 42% of variation in the use of the strategy. The note-taking strategy #30 was found to be significantly positively correlated with commitment ($F_{(1,\,295)} = 4.139$, $p< 0.038$) but negatively correlated with satiation control ($F_{(1,\,295)} = 4.139$, $p< 0.017$) that together account for 40% of the variance in the use of this strategy. The association strategy #69 was found to be significantly positively correlated with commitment ($F_{(1,\,295)} = 4.139$, $p< 0.016$) but negatively correlated with satiation control ($F_{(1,\,295)} = 4.139$, $p< 0.016$) that together account for 41% of the variance in the use of this strategy. Finally, the consolidation strategy #74 was found to be negatively related with overall self-regulation capacity ($F_{(1,\,295)} = 4.376$, $p< 0.013$), as well as with meta-cognitive control ($F_{(1,\,295)} = 4.376$, $p< 0.050$), together accounting for 42% of the variation in the use of this strategy.

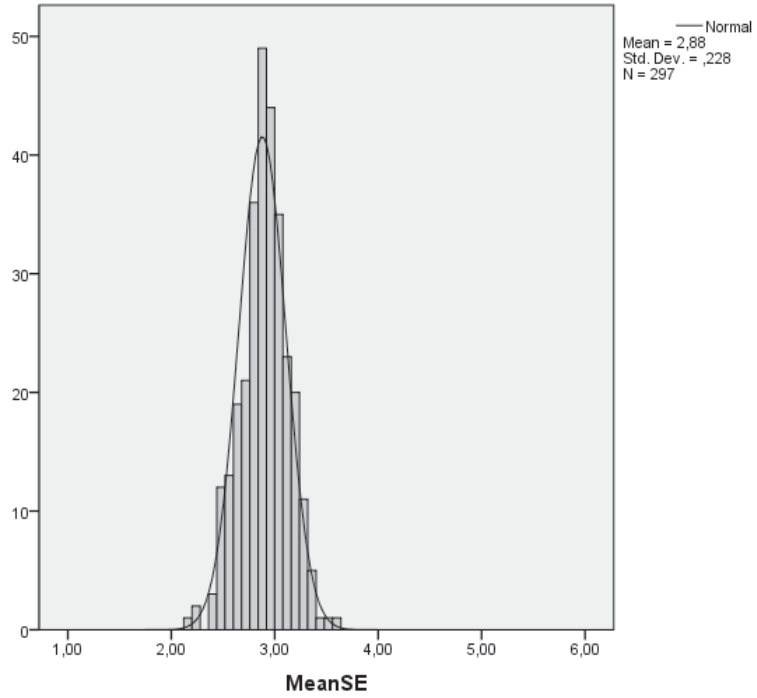
The aforementioned results provide some evidence concerning the role of self-regulation capacity on the frequent use of VLS in an ESP context on a purely exploratory basis. In this sense, ESP learners in our sample display a limited self-regulation capacity that seems to prevent them from making use of a wide of vocabulary learning strategies while learning technical vocabulary in their course. This is evident in the findings above, as only three out of the 16 correlations between VL use and self-regulation derived via MR analysis were found to be significantly positive, pointing

to more frequent use of strategies #5, #29, and #36 due to self-regulation. On the other hand, lack of appropriate self-regulation skills on the part of ESP learners seemed to have negatively impacted the frequency with which learners use vocabulary learning strategies such as #1, #10, ##22, 47, and #73 with potential setbacks in their progress in the ESP vocabulary learning process. Use of strategies #12, #30, #69 and, #74 has either been affected positively or negatively by more than one subcomponents of self-regulation capacity.

3.11. Self-Esteem and the Use of Vocabulary Learning Strategies

Figure 3.7. shows self-esteem scores for the total sample of 297 ESP learners. As can be observed, the distribution of responses provided by subjects to the self-esteem questionnaire appears varied with more answers heaped in the middle of the scale (SD = 0.228) exhibiting a relatively low self-esteem overall. This is also reflected by the low average of 2.88 on our five-point bar corresponding to the Likert scale used in the original instrument ranging from 1-strong agreement to 5-strong disagreement, revealing that ESP learners in our sample do not regard themselves as highly competent language learners, ultimately leading to negative attitudes towards L2 learning process, low frustration tolerance, lack of initiative to take risks when learning the language, and generally a poor self-image that is associated with feelings of learned helplessness, insecurity and anxiety in the language classroom (Arnold 2007). Our finding is also strengthened by unofficial comments made by our ESP learners who, in most of the cases, state that criticism, sarcastic comments, and harsh comparisons by their classmates often discourage them from trying to learn the language at the university.

Figure 3.7. Mean Score of Self-esteem in the Sample



3.11.1. Self-esteem and Gender

RQ1E: *Is there a relationship between ESP learners' level of self-esteem gender?*

More importantly, we found no significant differences between males (mean = 2.85) and females (mean = 2.90 with respect to level of self-esteem (t = -1.666, df = 295, p = 0.07). This result agrees with Adasifard and Beria's (2013) finding of no gender differences in relation to the degree of self-esteem exhibited by L2 language learning strategy users but in contrast to Basco and Han's (2016) finding where the level of self-esteem was found to be different between males and females among university English learners.

3.11.2. Self-esteem and Vocabulary Knowledge

RQ2E: *Is there a relationship between ESP learners' self-esteem and English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?*

The relationship between ESP learners' self-esteem and their vocabulary size scores was investigated using Pearson's product-moment correlation coefficient. The results indicate no significant relationship between the two variables, r=-0.04, p=.428. This finding contradicts the results of previous studies (Soureshjani and Naseri 2011; Alrabai 2017; Tifarlioglu 2014; Liu 2012; Hasemian 2012), where self-esteem was consistently found to correlate significantly with English proficiency level. We speculate that such discrepancy in results can be attributed either to the use of Nation's (2001) outdated Vocabulary Levels Test as a means of vocabulary knowledge measurement or to the nature of the correlational research employed here that relies solely on quantitative data.

3.11.3. Self-esteem and Use of VLS: Overall and In categories

RQ1F: *Is there a relationship between self-esteem and use of vocabulary learning strategies, overall and in categories?*

To explore the relationship between self-esteem and the overall use of VLS, we correlated ESP learners' self-esteem scores with their mean scores for VLS use over the seventy-five separate strategies. Pearson r correlations did not yield any significant relationship between overall VLS use and self-esteem (r=-0.03, p= .509). Similarly, self-esteem was not found to correlate with any VLS categories in our study, as displayed in Table 3.30. below in answer to RQ2F-8F. The categories of lexical guessing strategies (r =0.05, p =.375), dictionary use (r = 0.03, p=.576), social-discovery (r=-0.05, p=.336), note-taking (r = -0.07, p=.225), repetition (r=-0.01, p=.768), association (r=-0.03, p=.536), and consolidation (r=-0.07, p=.222) were not significantly correlated with ESP learners' esteem.

Table 3.30. Pearson Correlation Results for Self-esteem and VLS in Categories

	Lexical Guessing	Dictionary Use	Social-Discovery	Note-taking	Repetition	Association	Consolidation
Self-esteem	0.375	0.576	0.336	0.225	0.768	0.536	0.222

3.11.4. Self-esteem and Use of Individual VLS

RQ2F: *Is there a relationship between self-esteem and any individual vocabulary learning strategies?*

To examine the relationship between self-esteem and the use of individual VLS, we ran Pearson r correlations between learners' self-esteem scores and mean frequency ratings for each of the 75 VLS included in our questionnaire (RQ 9E-15E). The results appear a bit discouraging as only four VLS were found to be significantly related to self-esteem, as shown in Table 3.31. below. If self-esteem appears to account for the use of a small number of VLS, then it can be suggested that other learner factors may determine VLS use or may even combine with self-esteem when predicting VLS use (see 3.9. above). In the meantime, we will proceed to discuss the results of these four significant correlations, all of which fall within the three VLS categories discussed above.

Table 3.31. Pearson Correlation Results forSelf-esteem and Individual VLS

	Strategy #2	Strategy#14	Strategy #45	Strategy #54
Self-Esteem	0.132*	0.126*	-.0193**	-0.116*

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

In view of the results presented above, self-esteem was found to correlate positively with two strategies, i.e., lexical guessing strategy #2 of "analyze the structure of the word to guess its meaning" and a dictionary-use strategy #14 "looking up a new word in an internet dictionary". The finding clearly indicates that ESP learners with high self-esteem tended to favour using these two strategies as they considered them useful to

uncover the meaning of unknown technical words in their readings. On the other hand, low self-esteem correlated negatively with note-taking strategy #45, "noting the location where I have met the new word" and repetition strategy #54, "writing new words many times to memorize them", revealing that using these specific vocabulary strategies was not considered useful by ESP learners with low esteem in the vocabulary learning process and, therefore, not worth using at all. Although our results may be fragmentary and with no other previous study to compare them with, they seem to suggest that the way L2 learners think of themselves as capable and competent participants in the L2 learning process might be affecting their overall strategic behaviour and, subsequently, their effective language learning progress, as already theoretically posited by Oxford (2017).

3.12. Learning Styles and the Use of Vocabulary Learning Strategies

Descriptive statistics (table 3.32 below) revealed that the overall learning style preferences of ESP Greek university students are visual (65.7%), introverted (63.9%), random-intuitive (71.1%), closure-oriented (75.3%), global (63%), synthesizing (71.4%), sharpener (64%), deductive (60.3%), field-independence (65.9%), reflective (71.3%) and metaphoric (62.4%).

In other words, the ESP participants in our study tend to rely on visual means to learn (scale 1 of the LSS – "how I use my physical senses"), prefer independent work or enjoy working with one other person they know well (scale 2 of the LSS – "how I expose myself to learning situations"), they are more future-oriented, speculate possibilities, enjoy abstract thinking and avoid step-by-step instruction (scale 3 of the LSS – "how I handle possibilities"), focus carefully on more learning tasks, strive to meet deadlines, plan ahead for assignments and want explicit directions (scale 4 of the LSS – "how I deal with ambiguity and with deadlines"), they enjoy getting the gist or main idea and are comfortable communicating even if they don't know all the words or concepts (scale 5 of the LSS – "how receive information"), they tend to summarize material well, enjoy guessing meanings and predicting outcomes, and notice similarities quickly (scale 6 of the LSS – "how I further process information"), they tend to notice differences and seek distinctions among items when they memorize (scale 7 of the LSS – "how I commit material to memory"), they like to go from the general to the specific, to apply generalizations to experience, and to start with rules and theories rather than with specific

examples (scale 8 of the LSS – "how I deal with language rules"), they like to separate or abstract material from within a given context, even in the presence of distractions (scale 9 of the LSS – "how I deal with multiple inputs"), they prefer to think things through before action, not trusting gut reactions (scale 10 of the LSS – "how I deal with response time") and, finally, they prefer to conceptualize aspects of the learning material (e.g. the grammar system) in metaphorical terms.

Table 3.32. Means and SDs for the 23 learning styles for all 297 ESP learners

LSS Scales	Learning Style	Mean	Std. Deviation
Scale 1	**Visual**	**3.28 (65.7%)**	.49530
	Auditory	3.03 (60.8%)	.46130
	Tactile/Kinesthetic	2.94 (58.9%)	.56093
Scale 2	Extroverted	3.06 (61.3%)	.60798
	Introverted	**3.19 (63.9%)**	.46387
Scale 3	**Random-Intuitive**	**3.55 (71.1%)**	.57740
	Concrete-Sequential	3.39 (67.9%)	.55309
Scale 4	**Closure-Oriented**	**3.76 (75.3%)**	.77876
	Open	2.58 (51.6%)	.71939
Scale 5	**Global**	**3.15 (63%)**	.61072
	Particular	2.97 (59.5%)	.46884
Scale 6	**Synthesizing**	**3.56 (71.4%)**	.57730
	Analytic	3.06 (61.4%)	.46421
Scale 7	**Sharpener**	**3.19 (64%)**	.67158
	Leveler	2.85 (57.2%)	.61707
Scale 8	**Deductive**	**3.01 (60.3%)**	.63796
	Inductive	2.96 (59.3%)	.52625
Scale 9	**Field-Independence**	**3.29 (65.9%)**	.72838
	Field-dependence	2.97 (59.5%)	.61086
Scale 10	Impulsive	3.34 (66.8%)	.59994
	Reflective	**3.56 (71.3%)**	.77564
Scale 11	**Metaphoric**	**3,12 (62,4%)**	.84557
	Literal	3,01 (60,3%)	.78129

By using Pearson r correlations and multiple regression analyses, we will try to explore the effect of these preferred learning styles as reported by our ESP learners on VLS use both in categories and separately.

3.12.1. Learning Styles and vocabulary learning strategies: Overall and in categories

RQ1G: *Is there is a relationship between ESP learners' learning style and use of vocabulary learning strategies overall?*

To explore the relationship between learning styles and the overall use of VLS, we correlated ESP learners' self-esteem scores with their mean scores for VLS use over the seventy-five separate strategies. Pearson's r correlation yielded a significant and positive relationship between overall VLS use and the synthesizing learning style ($r = 0.038$, $p < 0.05$), suggesting that ESP learners who process L2 learning material synthetically (e.g., summarize material well, enjoy guessing meanings, predicting outcomes and notice similarities quickly) tend to use VLS more frequently than learners displaying other learning styles in this sample, as shown in table 3.33.below.

Table 3.33. Pearson Correlation Results for Learners' Learning Styles and Overall VLS Use.

	Overall VLS Use
Visual	0.279
Extroverted	0.660
Random	0.671
Closure	0.680
Global	0.509
Synthesizing	**0.038***
Sharpener	0.562
Deductive	0.972
Field-independence	
Reflective	0.336
Metaphoric	0.549
	0.725

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

RQ2G: *Is there a relationship between ESP learners' learning styles and the use of guessing strategies as a category?*

No significant relationship emerged between lexical guessing strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.34. below.

Table 3.34. Pearson Correlation Results for Learners' Learning Styles and Lexical Guessing Strategies as a Category.

	Lexical Guessing Strategies
Visual	0.817
Extroverted	0.953
Random	0.869
Closure	0.616
Global	0.650
Synthesizing	0.213
Sharpener	0.101
Deductive	0.438
Field-independence	
Reflective	0.482
Metaphoric	0.752
	0.825

RQ3G: *Is there a relationship between ESP learners' learning styles and the use of dictionary use strategies as a category?*

Dictionary use strategies as a category was found to significantly correlate with the synthesizing learning style ($r = 0.11$, $p<0.05$) exhibited by ESP learners in this study, as illustrated in table 3.35. below.

Table 3.35. Pearson Correlation Results for Learners' Learning Styles and Dictionary Use Strategies as a Category.

	Dictionary-Use Strategies
Visual	0.987
Extroverted	0.267
Random	0.390
Closure	0.457
Global	0.837
Synthesizing	**0.048***
Sharpener	0.334
Deductive	0.438
Field-independence	
Reflective	0.199
Metaphoric	0.759
	0.720

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

RQ4G: *Is there a relationship between ESP learners' learning styles and the use of social-discovery strategies as a category?*

No significant relationship emerged between social-discovery strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.36. below.

Table 3.36. Pearson Correlation Results for Learners' Learning Styles and Social-Discovery Strategies as a Category.

	Social-Discovery Strategies
Visual	0.266
Extroverted	0.091
Random	0.652
Closure	0.402
Global	0.251
Synthesizing	0.188
Sharpener	0.802
Deductive	0.749
Field-independence	
Reflective	0.442
Metaphoric	0.255
	0.742

RQ5G: *Is there a relationship between ESP learners' learning styles and the use of note-taking strategies as a category?*

No significant relationship emerged between social-discovery strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.37. below.

Table 3.37. Pearson Correlation Results for Learners' Learning Styles and Note-taking Strategies as a Category.

	Note-taking Strategies
Visual	0.288
Extroverted	0.145
Random	0.261
Closure	0.466
Global	0.956
Synthesizing	0.215
Sharpener	0.935
Deductive	0.184
Field-independence	
Reflective	0.543
Metaphoric	0.232
	0.797

RQ6G: *Is there a relationship between ESP learners' learning styles and the use of repetition strategies as a category?*

No significant relationship emerged between repetition strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.38. below.

Table 3.38. Pearson Correlation Results for Learners' Learning Styles and Repetition Strategies as a Category.

	Repetition Strategies
Visual	0.064
Extroverted	0.521
Random	0.832
Closure	0.729
Global	0.537
Synthesizing	0.159
Sharpener	0.929
Deductive	0.851
Field-independence	
Reflective	0.518
Metaphoric	0.134
	0.537

RQ7G: *Is there a relationship between ESP learners' learning styles and the use of association strategies as a category?*

No significant relationship emerged between association strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.39. below.

Table 3.39. Pearson Correlation Results for Learners' Learning Styles and Association Strategies as a Category.

	Association Strategies
Visual	0.156
Extroverted	0.932
Random	0.785
Closure	0.937
Global	0.378
Synthesizing	0.113
Sharpener	0.414
Deductive	0.756
Field-independence	
Reflective	0.594
Metaphoric	0.598
	0.691

RQ8G: *Is there a relationship between ESP learners' learning styles and the use of consolidation strategies as a category?*

No significant relationship emerged between consolidation strategies as a category and any of the learning styles exhibited by ESP learners in this study, as illustrated in table 3.40. below.

Table 3.40. Pearson Correlation Results for Learners' Learning Styles and Consolidation Strategies as a Category.

	Consolidation Strategies
Visual	0.981
Extroverted	0.636
Random	0.978
Closure	0.334
Global	0.781
Synthesizing	0.182
Sharpener	0.972
Deductive	0.199
Field-independence	
Reflective	0.848
Metaphoric	0.075
	0.335

3.12.2. Learning Styles and separate vocabulary learning strategies

RQ9G: *Is there a relationship between ESP learners' learning style and any individual guessing strategy?*

Out of the eleven lexical guessing strategies under examination in this study, only four were found to be significantly related to ESP learners' reported learning styles. Following table 3.41. below, a significant but negative correlation was found between the guessing strategy #3 of "trying to identify the grammatical category of the unknown word by focusing on the meaning of the sentence where it is" and random learning style ($F_{(1, 295)}$ =5.231, p <0.023) with an R^2 of .017. The second lexical strategy #4; "trying to guess the meaning of the word from its pronunciation, repeating it silently to myself" was found to correlate with the sharpener learning style in a significantly strong and positive way ($F_{(1,295)}$ =9.749, p <0.002) with an R^2 of .032. Lexical guessing strategy #5; "I guess the meaning of

the word by looking at the pictures accompanying the text" was found to correlate significantly and positively with the synthesizing learning style ($F_{(1,295)}$ =4.790, p <0.021) with an R^2 of .018 but in a negative way with the sharpener learning style ($F_{(1,295)}$ =4.790, p <0.009) with an R^2 of .032. Notably, the effect of these two learning styles accounts for 50% of the variation in using lexical guessing strategy #5. Finally, the lexical strategy #8; "keep on reading and try to guess the meaning of the unknown word another time" was found to correlate significantly and positively with the metaphoric learning style ($F_{(1,295)}$ =4.216, p <0.041) with an R^2 of .014.

Overall, the results indicate that ESP learners with a random learning style, who enjoy abstract thinking and disfavour step-by-step instruction use less lexical guessing strategy #3, while learners with a metaphoric learning style who conceptualize aspects of learning material in metaphoric terms use less lexical guessing strategy #5 and more lexical guessing strategy #8. On the other hand, sharpeners (learners who notice differences and seek distinctions among items while committing them to memory) show a strong preference towards using lexical guessing #4 while synthesizers prefer using lexical guessing #5.

Table 3.41. Stepwise Multiple Regression Results for Lexical Guessing Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Random Learning Style						
LG Strategy #3	0.132	0.017	0.014	0.017	-0.132	0.023	5.231
	Predictor Variable: Sharpener Learning Style						
LG Strategy #4	0.179	0.032	0.029	0.032	0.160	0.002	9.749
LG Strategy #5	Predictor Variable: Synthesizing Learning Style						
	0.134	0.018	0.015	0.018	0.134	0.021	
	Predictor Variable: Sharpener Learning Style						
	0.178	0.032	0.025	0.014	-0.118	0.009	4.790
	Predictor Variable: Metaphoric Learning Style						
LG Strategy #8	0.119	0.014	0.011	0.014	0.119	0.041	4.216

RQ10G: *Is there a relationship between ESP learners' learning style and any individual dictionary use strategy?*

Out of the eight dictionary use strategies under examination in this study, only three were found to be significantly related to ESP learners' reported learning styles. Following table 3.42. below, dictionary strategy #12 "I look up the word in a common or specialized bilingual (English-English) dictionary" and dictionary strategy #13; "I look up the word in a common or specialized monolingual (English-English) dictionary" correlated significantly and positively with the synthesizing learning style ($F_{(1, 295)}$ =4.014, p <0.046) with an R^2 of .013 and with the random learning style ($F_{(1, 295)}$ =3.983, p <0.046) with an R^2 of .013, respectively. These results indicate that synthesizers prefer using a bilingual dictionary to find the meaning of an unknown word, while randomizers use monolingual dictionaries for the same reason. The third dictionary use strategy #14 "I look up the word in a common or specialized bilingual or monolingual dictionary on the internet" was found to correlate significantly but negatively with the reflective learning style ($F_{(1, 295)}$ =4.128, p <0.043) with an R^2 of .014,indicating that ESP learners who think things through before taking action do not favour the use of an internet dictionary to look up new words, which is the easy way to find out the meaning of a new word but possibly they resort to other ways to learn vocabulary before finally turning to a dictionary.

Table 3.42. Stepwise Multiple Regression Results for Dictionary Use Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Synthesizing Learning Style						
DU Strategy #12	0.116	0.013	0.010	0.013	0.116	0.046	4.014
	Predictor Variable: Random Learning Style						
DU Strategy #13	0.115	0.013	0.010	0.013	0.115	0.046	3.983
	Predictor Variable: Reflective Learning Style						
DU Strategy #14	0.117	0.014	0.010	0.026	-0.117	0.043	4.128

RQ11G: *Is there a relationship between ESP learners' learning style and any individual social-discovery strategy?*

Out of the nine social-discovery strategies under examination in this study, five were found to be significantly related to ESP learners' reported learning styles. Following table 3.43. below, social-discovery strategy #20;"I ask my classmates for a Greek translation of the new word" was found to strongly and positively correlate with the global learning style ($F_{(1, 295)}$ =7.559, p <0.006) with an R^2 of .025 and social-discovery strategy #23; "I ask my English teacher for a Greek translation of the new word" was correlated equally strongly and positively with the deductive learning style ($F_{(1, 295)}$ =5.629, p <0.018) with an R^2 of .019. Strategies #21; "I ask my classmates for a definition of the new word in English" and #22; "I ask my classmates for the spelling/pronunciation of the new word in English" were also found to negatively correlate with the deductive style ($F_{(1, 295)}$ =4.971, p <0.017) for strategy #21 and ($F_{(1, 295)}$ =5.067, p <0.025) strategy#22,respectively. The same strategies were also found to strongly and positively correlate with the synthesizing learning style ($F_{(1, 295)}$ =4.971, p <0.008) for strategy #21 and ($F_{(1, 295)}$ =5.600, p <0.004) #22. Together the deductive and synthesizing styles account for 52% of the variation in the use of the social-discovery strategy #21 and for 54% of the variation in the use of the social-discovery strategy #22. Finally, social-discovery strategy; #25 "I ask my English teacher for a sentence-example of the new word" was found to positively correlate with the introverted learning style ($F_{(1, 295)}$ =5.983, p <0.025) but negatively with the closure-oriented learning style ($F_{(1, 295)}$ =5.983, p <0.003) that together account for 56% of the variation in the use of this strategy.

Table 3.43. Stepwise Multiple Regression Results for Social-Discovery Strategies.

Criterion Variable	R	R^2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Global Learning Style						
SD Strategy #20	0.158	0.025	0.022	0.025	0.158	0.006	7.559
	Predictor Variable: Deductive Learning Style						
SD Strategy #21	0.138	0.019	0.016	0.019	-0.138	0.017	
	Predictor Variable: Synthesizing Learning Style						
	0.181	0.033	0.026	0.014	0.119	0.008	4.971
SD Strategy #22	Predictor Variable: Deductive Learning Style						
	0.130	0.017	0.015	0.014	-0.130	0.025	
	Predictor Variable: Synthesizing Learning Style						
	0.192	0.037	0.030	0.020	0.144	0.004	5.600
	Predictor Variable: Deductive Learning Style						
SD Strategy #23	0.137	0.019	0.015	0.019	0.137	0.018	5.629
	Predictor Variable: Introverted Learning Style						
SD Strategy #25	0.130	0.017	0.014	0.017	0.130	0.025	
	Predictor Variable: Closure-Oriented Learning Style						
	0.198	0.039	0.033	0.022	-0.153	0.003	5.983

In conclusion, the results indicate that: (a) ESP learners of a deductive style (i.e., learners who go from the general to the specific) prefer to use more social-discovery strategy #23 but use less of strategies #21 and #22, synthesizers use more social-discovery strategies #21 and #22. In turn, global ESP learners (i.e., learners who focus on the main idea) use strategy #20 more, while introverted ones (i.e., learners who prefer word independently) prefer using strategy #25, ESP learners of a closure-oriented style (i.e., learners who focus carefully on all learning tasks, try to

meet deadlines, plan ahead for their assignments, and want explicit directions) tend to avoid using strategies.

RQ12G: *Is there a relationship between ESP learners' learning style and any individual note-taking strategies as a category?*

Out of the twenty-two note-taking strategies under examination in this study 10 were found to be significantly related to ESP learners' reported learning styles. Following table 3.44. below, strategies #30, 40, 41, 42 and 51 were found to correlate with more than one learning style. More specifically:

- a positive and strong correlation was found between note-taking strategy #30 "I write down information about new technical words in the margins of the textbook or where the word occurs" and the synthesizing learning style ($F_{(1, 295)}$ =4.590, p <0.032) with an R^2 of .015 and the introverted learning style ($F_{(1, 295)}$ =4.590, p <0.004), which alone accounts for 45% of the variation in the use of this strategy. In contrast, the random learning style was found to negatively correlate with the same strategy ($F_{(1, 295)}$ =4.590, p <0.009) with an R^2 of .032. Notably, all three learning styles accounted for 92% of the variation in the use of note-taking strategy #30.
- strategy 40 "I write down example-sentences with the technical word" was found to correlate strongly and positively with the introverted learning style ($F_{(1, 295)}$ =10.086, p <0.001), accounting for 64% of the variation in using the strategy, while it was also found to correlate negatively with the random learning style ($F_{(1, 295)}$ =10.086, p <0.004). Together the two learning styles accounted for 91% of the variation in the use of note-taking strategy #40.
- strategy #41 "I write down the pronunciation of new technical words" strongly correlated with two learning styles, i.e., the global learning style ($F_{(1, 295)}$ =4.341, p <0.029) with R^2 of .016 and the synthesizing learning style ($F_{(1, 295)}$ =4.341, p <0.012) with R^2 of .0.30, and it also negatively correlated with the deductive learning style ($F_{(1, 295)}$ =4.341, p <0.005) with R^2 of .043. All three learning styles accounted for 89% of the variation in the use of note-taking strategy #41.
- strategy #42 "I write down the grammatical category of new technical words" strongly and positively correlated with the sharpener's learning style ($F_{(1, 295)}$ =8.021, p <0.001) with R^2 of

.0.37 but negatively with the random learning style ($F_{(1, 295)}$ =8.021, p <0.001) with R^2 of .0.52. Both learning styles accounted for 89% of the variation in the use of note-taking strategy #42.

- strategy #51 "I use different devices to highlight the words I consider important (e.g., capital letters, coloured pens or markers, asterisks, lines, etc)" was strongly and positively correlated with the synthesizing learning style ($F_{(1, 295)}$ =4.690, p <0.025) with R^2 of .017 and, equally, strongly but negatively with the sharpener learning style ($F_{(1, 295)}$ =4.690, p <0.010) with R^2 of .031. Both learning styles account for 38% of the variation in the use of note-taking strategy #51.
- strategy #31 "I write down information about new technical words on my English notebook", and strategy #50; "I write down the new words in the order I meet them" were found to negatively correlate with the synthesizing learning style ($F_{(1, 295)}$ =4.010, p <0.046) with R^2 of .013 and ($F_{(1, 295)}$ =4.887, p <0.028) with R^2 of .0.17, respectively.
- strategy #37 "I write down new technical words and their definitions in English" was found to negatively correlate with the random learning style ($F_{(1, 295)}$ =7.031, p <0.008) with R^2 of 0.23.
- strategy #32 "I write down information about new technical words in a specific vocabulary section at the end or top of my English notebook" and strategy #45; "I write down the contextual reference for the new word (e.g., page number, unit or lesson)" were found to strongly and positively correlate with the synthesizing learning style ($F_{(1, 295)}$ =7.031, p <0.008) with R^2 of .023 and the visual learning style ($F_{(1, 295)}$ =5.943, p <0.015) with R^2 of .020, respectively.

Table 3.44. Stepwise Multiple Regression Results for Note-taking Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Synthesizing Learning Style						
NT Strategy #30	0.124	0.015	0.012	0.015	0.124	0.032	
	Predictor Variable: Random Learning Style						
	0.178	0.032	0.025	0.016	-0.138	0.009	
	Predictor Variable: Introverted Learning Style						
	0.212	0.045	0.035	0.013	0.118	0.004	4.590
	Predictor Variable: Sharpener Learning Style						
NT Strategy #31	0.116	0.013	0.010	0.013	-0.116	0.046	4.010
	Predictor Variable: Synthesizing Learning Style						
NT Strategy #32	0.153	0.023	0.020	0.023	0.153	0.008	7.031
	Predictor Variable: Random Learning Style						
NT Strategy #37	0.141	0.020	0.016	0.020	-0.141	0.015	5.949
	Predictor Variable: Random Learning Style						
NT Strategy #40	0.164	0.027	0.024	0.027	-0.164	0.004	
	Predictor Variable: Introverted Learning Style						
	0.253	0.064	0.058	0.037	0.196	0.001	10.086
NT Strategy #41	Predictor Variable: Global Learning Style						
	0.127	0.016	0.013	0.016	0.127	0.029	
	Predictor Variable: Synthesizing Learning Style						
	0.173	0.030	0.023	0.014	0.117	0.012	
	Predictor Variable: Deductive Learning Style						
	0.206	0.043	0.033	0.013	-0.116	0.005	4.341

NT Strategy #42	Predictor Variable: Sharpener Learning Style						
	0.192	0.037	0.033	0.037	0.191	0.001	
	Predictor Variable: Random Learning Style						
	0.227	0.052	0.045	0.015	-0.130	0.001	8.021
NT Strategy #45	Predictor Variable: Visual Learning Style						
	0.141	0.020	0.016	0.020	0.141	0.015	5.943
NT Strategy #50	Predictor Variable: Sharpener Learning Style						
	0.128	0.016	0.013	0.016	-0.128	0.028	4.887
NT Strategy #51	Predictor Variable: Synthesizing Learning Style						
	0.131	0.017	0.014	0.0170	0.131	0.025	
	Predictor Variable: Sharpener Learning Style						
	0.176	0.031	0.024	0.014	-0.130	0.010	4.690

RQ13G: *Is there a relationship between ESP learners' learning style and any individual repetition strategy?*

Out of the nine repetition strategies under examination in this study, 5 were found to be significantly related to ESP learners' reported learning styles. Following table 3.45., strategies #55, "I listen to the words on an internet dictionary", #57 "I say the word and its Greek translation" and #58 "I repeat example-sentences of the word several times" were all found to yield significantly strong and positive correlations with the reflective learning style ($F_{(1, 295)}$ =7.322, p <0.007) with R^2 of .024 and the random learning style ($F_{(1, 295)}$ =4.707, p <0.031) with R^2 of .016 for strategy #57 and ($F_{(1, 295)}$ =5.963, p <0.015) with R^2 of .020 for strategy #58. On the other hand, strategies #54; "I write the new word several times" and #60;"I repeat the spelling of the word several times, letter by letter" were negatively correlated with the metaphoric learning style ($F_{(1, 295)}$ =7.078, p <0.008) with R^2 of .023 and with the random learning style ($F_{(1, 295)}$ =4.437, p <0.036) with R^2 of .015, respectively.

Table 3.45. Stepwise Multiple Regression Results for Repetition Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Metaphoric Learning Style						
REP Strategy #54	0.153	0.023	0.020	0.023	-0.153	0.008	7.078
	Predictor Variable: Reflective Learning Style						
REP Strategy #55	0.156	0.024	0.021	0.024	0.156	0.007	7.322
	Predictor Variable: Random Learning Style						
REP Strategy #57	0.125	0.016	0.012	0.016	0.125	0.031	4.707
	Predictor Variable: Random Learning Style						
REP Strategy #58	0.141	0.020	0.016	0.020	0.141	0.015	5.963
	Predictor Variable: Random Learning Style						
REP Strategy #60	0.122	0.015	0.011	0.015	-0.122	0.036	4.437

RQ14G: *Is there a relationship between ESP learners' learning style and any individual association strategy?*

Out of the ten association strategies under examination in this study, four were found to be significantly related to ESP learners' reported learning styles. Following table 3.46. below, strategies #64; "I associate new words with similar words in Greek" and #66; "I relate new words to words with usually go together in speech or written in technical texts" correlated positively and strong with the random ($F_{(1,\ 295)}$ =9.805, p <0.002) with R^2 of .032 and the visual learning style ($F_{(1,\ 295)}$ =5.255, p <0.023) with R^2 of .018, respectively. On the other hand, a negative correlation was found between strategy #69; "I associate new words with the place I see or hear them" and the reflective learning style ($F_{(1,\ 295)}$ =4.549, p <0.015) with R^2 of .012. Strategy #65; "I use the Keyword Method" was found to positively and strongly correlate with the visual

($F_{(1, 295)}$ =8.113, p <0.001) with R^2 of .040) and the global learning style ($F_{(1, 295)}$ =8.113, p <0.001) with R^2 of .052), both accounting for92% of the variation in the use of this strategy.

Table 3.46. Stepwise Multiple Regression Results for Association Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Random Learning Style						
ASSOC Strategy #64	0.179	0.032	0.029	0.032	0.179	0.002	9.805
	Predictor Variable: Visual Learning Style						
	0.199	0.040	0.036	0.040	0.199	0.001	
ASSOC Strategy #65	Predictor Variable: Global Learning Style						
	0.229	0.052	0.046	0.013	0.113	0.001	8.113
	Predictor Variable: Visual Learning Style						
ASSOC Strategy #66	0.132	0.018	0.014	0.018	0.132	0.023	5.255
	Predictor Variable: Reflective Learning Style						
ASSOC Strategy #69	0.123	0.015	0.012	0.015	-0.123	0.034	4.549

RQ15G: *Is there a relationship between ESP learners' learning style and any individual consolidation strategy?*

Finally, of the five consolidation strategies under examination in this study, two of them were found to be significantly related to ESP learners' reported learning styles. Following table 3.47. below, strategy #71; "I quiz myself or have others quiz me on new words" and #73; "I search for scientific articles on my subject of studies in English to practice and expand my technical vocabulary knowledge" were found to positively correlate with the visual ($F_{(1, 295)}$ =4.707, p <0.031) with R^2 of .016 and the reflective learning style ($F_{(1, 295)}$ = 4.090, p <0.044) with R^2 of .014, respectively.

Table 3.47. Stepwise Multiple Regression Results for Consolidation Strategies.

Criterion Variable	R	R2	Adjusted R2	R2 change	Beta	p	F
	Predictor Variable: Visual Learning Style						
CONS Strategy #71	0.125	0.016	0.012	0.016	0.125	0.031	4.707
	Predictor Variable: Reflective Learning Style						
CONS Strategy #73	0.117	0.014	0.010	0.014	0.117	0.044	4.090

3.13. Conclusion

In this chapter, we have attempted to cover in two main sections both the research methodology and design followed in our study as well as its key results that answer in quantitative terms the main research questions and hypotheses posited at the beginning of our research. In this sense, we have provided empirical evidence on the use of VLS across the whole sample regardless of the three predictor variables, self-regulation vocabulary capacity, self-esteem and learning style stated in our study while at the same, we have also considered the contribution of these three variables to the use of VLS in order to explore their role in determining VLS changes in use by Greek ESP learners.

CHAPTER 4

SUMMARY AND CONCLUSIONS

4.1. Introduction

In this chapter, the most relevant research results presented in chapter four are summarized and discussed in relation to the relevant literature review on the overall VLS use, self-regulation capacity, self-esteem and learning styles. It begins with a summary of key findings, which are considered to support our general conclusions, followed by a presentation of the methodological limitations of the study, at the same time, suggesting potential areas for future investigation as a way of improving and extending the present study. Finally, some pedagogical implications are also offered at the end of the chapter that mainly consist of practical implications of the study in terms of instructional practices and methodology employed in the successful implementation and incorporation of VLS training in ESL and ESP settings alike.

4.2. Summary of Main Findings

The scope of the present study has been to investigate VLS use by ESP Greek university students and investigate the extent to which self-regulation capacity, self-esteem and learning styles influence the rate of VLS use. In chapter four, we have provided a thorough account of the results of our investigation in purely quantitative terms that was, subsequently, accompanied by an interpretation and a cross-examination of our results against results yielded by previous VLS and related SLA research as an effort to better comprehend the role of self-regulation, self-esteem and learning style in the L2 vocabulary acquisition process in an ESP context. What follows is a summary of the principal findings of our study following the sequence in which the research questions and hypotheses were presented in 3.3.

1. Overall Vocabulary Learning Strategy Use by ESP Learners

In this regard, seventeen research questions and four hypotheses were posited without considering any of the learner variables (see 3.9. for the description of these results). Most of the significant results were reported via ANOVA with the Bonferroni adjustment test and the rest with t-tests.

- **Research Question 1A**

What are the *most* and *least* frequently used VLS for ESP learners?

Overall, ESP learners appear to have a moderate to low rate of self-reported use of vocabulary learning strategies, partly attributed to ESP learners' lack of training in vocabulary learning strategies and partly to an expressed lack of interest in foreign language learning even while attending primary and secondary school. Using words in the sentence and/or the paragraph to guess the meaning of a new word (Lexical Guessing strategy) was the most often used VLS, followed by writing down the Greek translation of a technical word (Note-Keeping strategy) as well as using an online dictionary to check the meaning of a word (Dictionary Use strategy). Other highly-frequently used strategies among ESP Greek learners of our sample included guessing a new word by checking its similarity to a Greek word and relying on the general meaning of the text. In addition, keeping notes of new vocabulary after every class session, repeating new words English technical words along with their L1 (Greek) translation and use of dictionaries to check the meaning, spelling, and use of new technical English vocabulary in sentence-example also emerged among the most frequently used VLS for this group of learners.

The least frequently used VLS was writing summaries using the new words (Consolidation strategy) followed by a note-keeping strategy, i.e., keeping notes in small cards to learn new words. A similar pattern was observed regarding keeping notes on a computer or any other electronic device. Another five note-keeping strategies were also ranked among the least used VLS strategies in our study, as ESP learners are not accustomed to organize their vocabulary notes either alphabetically or based on the grammatical category of the new words or even by topic, and they do not tend to keep notes of information related to the grammar or pronunciation of new technical words either. Lastly, ESP learners also reported low-frequent use of testing or having others test their vocabulary knowledge as a consolidation strategy, as it is most commonly associated in learners' minds with the stressful situation of an exam procedure.

- **Research Question 2A**

What are the *most* and *least* frequently used VLS *categories* for ESP learners?

Our 75-item VLS-Q comprises seven strategy categories. The most frequently used VLS category was guessing strategies (mean = 4.22). Consolidation strategies, on the other hand, were the least frequently used category (mean = 2.56). Dictionary-use strategies were the second most used category. An interesting frequency pattern was observed among repetition and social-discovery strategies in that they had a similar frequency rating (Means = 3.61 and 3.47) as well as among note-taking and association strategies (Means = 3.24 and 3.21). This means that there were not much significant differences between these categories, except for guessing strategies as compared with note-taking, repetition, social-discovery, association and consolidation strategies and for repetition and association strategies as compared with consolidation strategies ($F_{(6, 1776)} = 114.812$, $p<0.001$)

- **Research Question 3A**

Is there a relationship between VLS frequency use by ESP learners and gender?

Females were found to use note-taking strategies as a category more often than males. Significant gender differences were also found in the use of twenty-four individual vocabulary strategies, with males using specific note-taking strategies (strategies #33, 35, 42, 47, 48 and 49) and one consolidation strategy (strategy #73) more often than females. Females also tended to use more frequently a wide range of vocabulary strategies from all categories, i.e., lexical guessing strategies (strategy #6), dictionary-use strategies (strategies# 14, 17 and 19), social-discovery strategies (strategies #23 and 29), note-taking strategies (strategies# 36, 39, 6, 49, 50 and 51), repetition strategies (strategies #54, 57 and 60), association strategy (strategy#65) and consolidation strategies (strategies #71 and 72). Overall, no gender differences were found with respect to overall VLS use ($t = -1.522$, $df = 295$, $p = .196$).

- **Research Question 4A**

Is there a relationship between VLS frequency use by ESP learners and their English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

Vocabulary knowledge was found to correlate positively with using dictionary strategies as a category in 6 out of 75 vocabulary learning strategies included in our questionnaire, and the results yielded two negative and four positive correlations. In this sense, it appears that ESP learners with low vocabulary knowledge were less likely to prefer skipping guessing the meaning of new words (Lexical Guessing) and keeping vocabulary notes in a notebook they were using for other courses (Note-keeping strategies. On the other hand, strategies #12 ("looking up a new word in a bilingual dictionary"), 18 ("checking the grammatical category of the new word in a dictionary"), 19 ("checking sentence-examples of the new word in a dictionary"), and 51 ("saying aloud new words to memorize them") all correlated positively with vocabulary knowledge indicating a strong preference by ESP learning with high vocabulary proficiency.

2. Vocabulary Learning Strategy Use Per Category by ESP Learners

- **Research Question 1B**

What type of *lexical guessing* strategies are most and least frequently used by ESP learners?

All in all, a significant difference was observed among the VLS in this category ($F(10, 2960) = 41.092$, $p < 0.001$). Thus, guessing meaning from the written context available either in the sentence and/or in the paragraph where the unknown word occurs in technical English texts emerged as the most frequently used guessing strategy used by all ESP learners in our sample (mean = 5.49), which significantly differed from guessing meaning by the topic of the text (< 0.001), followed by guessing via checking L1 Greek cognates (mean = 5.11). On the other hand, identifying common words that have a technical meaning was the least frequently used strategy (mean = 3.39) $p< 0.001$ using the Bonferroni adjustment. Greek ESP learners also claimed to use other types of guessing with moderate and similar frequency – analyzing the structure of the word (mean = 4.02), identifying the grammatical category of the new word (mean = 4.21), continue reading and guess the meaning of the new word another time (mean = 4.60), and relying on the text topic to guess the meaning of a new word (mean =4.89) appeared to be rated slightly higher. Only one significant difference emerged between the strategy of identifying the grammatical category of the new word as compared with relying on the

text topic to guess the meaning of a new word that favoured the use of the latter ($p < 0.001$) – using the Bonferroni test.

- **Research Question 2B**

What is the most frequently used type of dictionary used by ESP learners?

Hypothesis 2:

Bilingual dictionaries are more frequently used by all learners than monolingual dictionaries.

Hypothesis 3:

Electronic dictionaries and internet-based dictionaries are the least frequently used vocabulary reference works.

The first hypothesis was statistically confirmed, while the second was not. Significant differences were observed among the four types of dictionaries via one-way within-subjects ANOVA ($F_{(2,592)} = 91.762$, $p<0.001$). The Bonferroni adjustment for multiple comparisons was performed to check for valid significant differences. Learners reported using bilingual dictionaries more frequently than monolingual dictionaries ($p < 0.001$), while internet-based strategies were used much more frequently ($p < 0.001$) than both bilingual and monolingual dictionaries in print form.

- **Research Question 3B**

What is the order of frequency with which different kinds of information are looked up in the dictionary?

The ANOVA results showed a significant difference in the use of these strategies ($F_{(4, 1184)} =82.982$, $p< 0.001$). Thus, in order of frequency, learners claim to use dictionaries to check (1) meaning, (2) spelling, (3) pronunciation, (4) examples for proper use of the word, and (5) grammar of the word. However, no significant differences were found between (1) (3) (5) (p = n.s.); hence we can conclude that learners frequently focus on meaning, spelling and sentences -examples of the usage of new technical words when using dictionaries. Interestingly, these five strategies were rated above 4 on the 1-6 scale.

REPETITION STRATEGIES

- **Research Question 4B**

What type of repetition is most and least frequently used?

ANOVA revealed a significant difference among the four modes of repetition $F_{(3, 888)} = 39.856$, $p< 0.001$). The most frequently used mode of repetition for our ESP learners involved memorizing new words by writing

them many times. Repeating words to myself silently is used at the same relatively high frequency as there was no significant difference between them (p = n.s.) with an average mean frequency of 4.03. Listening to the pronunciation of a new word in an online dictionary emerged as the least used the other three vocabulary learning repetition strategies ($p < 0.001$ using the Bonferroni adjustment).

- **Research Question 5B**

What information about new words is most and least handled repeatedly?

To answer this question, we put five VLS together which described several types of information handled repeatedly. Again an overall significant difference was observed via ANOVA($F_{(4,1185)} = 59.648$, $p<0.001$). More specifically, it was found that learners most prefer to repeat new words with their L2 translation in Greek ($p < 0.001$ using the Bonferroni adjustment). In contrast, repeating new words in sentence-examples several times appears to be the least frequently used repetition strategy of this type ($p < 0.001$ using the Bonferroni adjustment). Repetition of the new word with its spelling in a sentence-example and with their L2 definition were among the least frequently used repetition strategies among ESP learners in our sample. As indicated above (RQ-2A), no significant differences were observed between repetition and association strategies.

SOCIAL-DISCOVERY STRATEGIES

- **Research Question 6B**

What type of person is the most and least frequently asked for information about new words?

Two general types of person were selected for analysis, i.e., asking classmates and asking teachers. A significant difference was found in the frequency with which learners ask these two types of person for information about a word. The results showed that learners tend to ask the teacher for information about words more frequently than other learners ($p < 0.001$) using the Bonferroni test.

- **Research Question 7B**

What is the most frequent kind of information they ask for and from whom?

One-way within-subjects ANOVA revealed a significant difference in the use of these nine vocabulary learning strategies ($F_{(8, 2368)} = 25.823$, $p< 0.001$). First of all, it was found that Greek ESP learners significantly

differed regarding the person they considered most helpful to aid them in understanding the meaning of a new technical word as well as to the kind of information they opted to ask. In this respect, ESP learners tended to significantly ask the help of their teacher more than their classmates ($p<0.001$, using the Bonferroni test) to provide them with the Greek translation of the new technical word and its English definition. Further comparisons revealed that ESP learners tended to equally ask for their teacher's help when asking for either a sentence-example for the usage of a new word, for its pronunciation/spelling as well for teacher explanation with regard to the use of the technical word with similar frequency (p =n.s.). Asking their classmates for information about the spelling/pronunciation of a new word was found to be far the least-frequent strategy used in the category.

- **Research Question 8B**

What is the order of frequency with which different kinds of information about new words are requested?

ANOVA showed an overall significant difference in the kind of information that learners request about new words ($F_{(5,1480)} = 10.559$, $p<0.001$). Descriptively, the results showed that these ESP learners ask for the following in order of frequency: (1) Greek translation, (2) a sentence-example for the new word, (3) definition of the new word in English, (4) the proper use of the new word, (5) the grammar of the word, and (6) pronunciation/spelling. Asking to know the Greek translation of an unknown English word is significantly more preferred than any other kind of word information by ESP learners in our study ($p<0.001$). They are also interested in sentence-examples of the new word much more than knowing its pronunciation and spelling ($p<.005$), which is one of the last things they ask a teacher or classmate although spelling and pronunciation are frequently looked up in the dictionary after word meaning (see above RQ 3B).

NOTE-TAKING STRATEGIES

- **Research Question 9B**

What is the most and least frequent place for keeping a note of new word?

Six mean frequency ratings were subjected to analysis showing an overall significant difference ($F_{(5,1480)} = 54.764$, $p<0.001$). Keeping vocabulary notes in a specific textbook just for this purpose emerged as the most frequent place-related note-taking strategy. By contrast, ESP learners reported keeping vocabulary notes on an electronic device very

infrequently. In fact, this strategy also figured among the ten most frequently used strategies overall. On the other hand, no significant difference was found between keeping notes of new words in a specific section of a notebook (strategy 45) and keeping vocabulary notes where learners meet a new vocabulary (strategy 32), which is used moderately (mean frequency: 3.08) by our ESP learners as well as between keeping vocabulary notes on the margins of the textbook (strategy 30) and keeping vocabulary notes beside every text where I find new words (strategy 50), which is used relatively higher with a mean frequency of use of 4.01.

- **Research Question 10B**

What is the order of frequency with which different kinds of information about new words are written down?

The results showed the following frequency order with which learners write down information about new words ($F_{(8, 2368)} = 94.040$, $p<0.001$): (1) L1 translation, (2) multiple meanings of new words, (3) L2 definitions, (4) antonyms/synonyms of new words, (5) syntax of the new words, (6) contextual/situational use, (7) sentence-examples, (8) grammatical category and (9) pronunciation. No significant differences were observed among (3), (4) and (5) (p = n.s., using the Bonferroni test), suggesting that learners use all these note-taking strategies with similar moderate frequency. Likewise, no significant differences were found among (6), (7) (8), (9), showing that they are the least frequent recorded word information (p = n.s., using the Bonferroni test). Keeping notes of the grammatical category and pronunciation of new words were also rated among the ten least frequently used vocabulary learning strategies overall.

- **Research Question 11B**

What is the most and least frequent way of organizing notes about new words?

In terms of ways of organizing notes, ANOVA showed an overall significant difference ($F_{(3, 888)} = 173.207$, $p< 0.001$). More specifically, learners do not seem to worry much about the way they organize their vocabulary notes as they reported taking notes after every class session as the one most frequently used manner of organizing words, followed by highlighting new words in different ways and organizing new vocabulary per textbook unit, both used at an equally high rate as well. By contrast, the least frequent ways of organizing vocabulary notes include alphabetical order and grammatical category, which makes sense because they demand a higher degree of organization. These two sets of strategies

were selected to answer this research question because no significant differences were detected (p = n.s., using the Bonferroni adjustment).

ASSOCIATION STRATEGIES

- **Research Question 12B**

What type of association is most frequently used?

Hypothesis 1:

The Keyword Method is the least-frequently used association strategy.

ANOVA revealed a significant difference among the four modes of repetition ($F_{(9, 2664)} = 26.586$, $p<0.001$). The most frequently used mode of repetition involved memorizing the spellings of new words and associating new words to formally similar words in Greek, as confirmed by the significant difference found between these two strategies and any other association strategy ($p<0.001$). On the other hand, strategy 65; using the Keyword Method was found to be amongst the least frequently used association strategies by ESP learners in our study, including strategy 61 (associating the spelling of new words with other English words of similar sound or spelling), strategy 62 (associating new words with their synonyms/antonyms), strategy 63 (associating new words in English with similar words in another foreign language), and strategy 70 (thinking of prefixes/suffixes that could be added to the new word), with an average frequency use of 2.84 since no statistically significant differences were found among these strategies (p = n.s.).

CONSOLIDATION STRATEGIES

- **Research Question 13B**

What type of consolidation strategies are most and least frequently used?

Five types of further-consolidation strategies were arranged together for analysis, showing a significant difference ($F_{(4, 1184)} = 60.641$, $p<0.001$). Watching documentaries related to the topic of their studies to enrich their knowledge of technical vocabulary in English and attending speeches/lectures in English ranked first in this category, differing significantly from the other three strategies ($p<0.001$ using Bonferroni adjustment). The most infrequent further-consolidation strategies involve searching for more scientific texts to expand their vocabulary knowledge and writing summaries using the new words as no significant difference between them was found (p = n.s.). These two strategies were also cited at the bottom of the overall ranking of VLS in terms of frequency of use for our ESP learners in this study.

3. Self-Regulation, Gender and Vocabulary Knowledge

- **Research Question 1C**

Is there a relationship between the self-regulation capacity ESP learners exhibit and gender?

The distribution of responses provided by subjects to the self-regulation capacity questionnaire appears varied with more answers heaped in the middle of the scale (SD = 0.919), exhibiting a moderately low self-regulation vocabulary capacity overall. Independent t-test results showed no significant differences between males (mean = 4.09) and females (mean = 4.13) with respect to self-regulation vocabulary capacity (t = -0.373, df = 295, p = n.s.). Equally, no gender differences were found with respect to each of the five self-regulation capacity aspects, i.e., commitment, meta-cognitive, satiation, emotion and environment control.

- **Research Question 2C**

Is there is a relationship between the self-regulation capacity ESP learners exhibit and their English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

The relationship between learners' self-regulation capacity in vocabulary learning and their vocabulary size scores was investigated using Pearson's product-moment correlation coefficient. The results indicate no significant relationship between the two variables, r=-.008, p=.895. The results also indicated no significant relationship between any of the individual self-regulation capacity facets (commitment, meta-cognitive, satiation, emotion and environment control) and vocabulary size score.

4. Self-Regulation and the Use of Vocabulary Learning Strategies

- **Research Question 1D**

Is there is a relationship between the self-regulation capacity ESP learners exhibit and overall use of vocabulary learning strategies?

Results indicated no significant relationship between overall VLS use and self-regulatory vocabulary capacity (r =-.010, p = .863) or any of its separate facets, i.e., commitment control, metacognitive control, satiation control emotion and environment control. This suggests that the extent of self-regulation capacity as reported by our ESP learners did not affect the rate they use various strategies in their effort to learn new technical words in English.

A. Self-Regulation Capacity and use of VLS as categories

- **Research Questions 2D-8D**

It should be recalled that the VLS questionnaire includes seven different VLS categories, whose separate strategies were logically arranged into guessing strategies, dictionary use strategies, social-discovery strategies, note-taking strategies, repetition strategies, association strategies, and further consolidation strategies. For each category, mean scores were computed. The results for RQs 2D-8D showed no significant correlations between self-regulation vocabulary capacity and any of the VLS categories in our study. More specifically, lexical guessing strategies (RQ2D, r = -0.33, p =.573), dictionary use (RQ3D, r = .005, p=.931), social-discovery (RQ4D, r=-.001, p=990), note-taking (RQ5D, r = -.006, p=.922), repetition (RQ6D, r=-.001, p=.980), association (RQ7D, r=.016, p=779) and consolidation (RQ8D, r=-.080, p=.170) were not significantly correlated with ESP learners' self-reported self-regulation vocabulary capacity skills.

B. Self-Regulation Capacity and the use of individual VLS

- **Research Question 9D-15D**

Overall, the use of only 12 vocabulary learning strategies from six VLS groups was found to be significantly related to different self-regulating vocabulary capacity sub-components. With respect to RQ9D, the guessing strategies of "checking a new work against Greek for formal similarity" and "easy identification of the technical vocabulary in texts" were found to significantly but negatively correlated with the sub-components of satiation control and commitment control, respectively, while "looking at pictures in the text to help guessing the meaning of new words" was found to significantly and positively correlate with the subcomponent of self-regulation vocabulary capacity of commitment control. Only one dictionary-use strategy "looking up a new word in a bilingual dictionary" statistically correlates with two subcomponents of self-regulating capacity, i.e., (i) negatively with meta-cognitive control component and (ii) positively with emotion control subcomponent. One negative but significant correlation was also found between the social-discovery strategy of "asking my fellow students for the spelling/pronunciation of the new word" and the sub-component of self-regulation vocabulary capacity of emotion control (RQ11D).

Four note-taking strategies (RQ12D) were found to correlate significantly with different components of self-regulating capacity as displayed by our ESP learners in this study: (i) the strategy of "taking down new vocabulary in every class session" was found to correlate significantly positively with the subcomponent of self-regulating vocabulary capacity of commitment control, (ii) the strategies of "keeping vocabulary notes on the margins of the book" was found to positively correlate with the self-regulating subcomponent of commitment but negatively with satiation control, (iii) the strategy of "taking down the Greek translation of a new technical word" was found to positively correlate with the environment control component of self-regulating capacity and (iii) the strategy of "classification of new words based on their grammatical category" was found to be significantly but negatively correlated with the satiation control self-regulating capacity subcomponent.

None of the nine repetition vocabulary learning strategies could be predicted by either of SRC (voc) components predict variance using separate repetition vocabulary learning in a statistically significant way (RQ13D). With respect to the association strategies (RQ14D), "associating new technical words with the location they are found" was the only strategy in this category that was found to negatively but significantly correlate with the satiation control subcomponent but positively with the commitment control subcomponent. Finally, with respect to the consolidation vocabulary learning strategies category, the strategy of "searching for more scientific texts to expand my vocabulary knowledge" was found to significantly but negatively correlate with the satiation self-regulating capacity subcomponent, while the strategy of "watching English documentaries to enrich my technical vocabulary knowledge" was found to significantly correlate with both overall self-regulating capacity as well as with the meta-cognitive self-regulating capacity subcomponent but negatively.

5. Self-Esteem and the Use of Vocabulary Learning Strategies

- **Research Question 1E**

Is there a relationship between ESP learners' level of self-esteem and gender?

The distribution of responses provided by subjects to the self-esteem questionnaire appears varied with more answers heaped in the middle of the scale (SD = 0.228), exhibiting a relatively low self-esteem overall. We found no significant differences between males (mean = 2.85) and females

(mean = 2.90 with respect to level of self-esteem (t = -1.666, df = 295, p = 0.07).

- **Research Question 2E**

Is there is a relationship between ESP learners' level of self-esteem and English receptive vocabulary proficiency as measured by the Vocabulary Levels Test?

The relationship between ESP learners' self-esteem and their vocabulary size scores was investigated using Pearson's product-moment correlation coefficient. such a discrepancy in results can be attributed either to the use of Nation's (2001) outdated Vocabulary Levels Test for vocabulary knowledge measurement or to the nature of the correlational research employed here that relies solely on quantitative data.

6. Self-esteem and the Use of Vocabulary Learning Strategies

- **Research Question 1F**

Is there is a relationship between self-esteem and vocabulary learning strategies, overall and in categories?

Pearson's r correlations did not yield any significant relationship between overall VLS use and self-esteem (r=-0.03, p= .509). Similarly, self-esteem was not found to correlate at all with any VLS categories in our study, i.e., guessing strategies (r =0.05, p =.375), dictionary use (r = 0.03, p=.576), social-discovery (r=-0.05, p=.336), note-taking (r = -0.07, p=.225), repetition (r=-0.01, p=.768), association (r=-0.03, p=.536) and consolidation (r=-0.07, p=.222) were not significantly correlated with ESP learners' esteem.

- **Research Question 2F**

Is there a relationship between self-esteem and any individual vocabulary learning strategies?

Self-esteem was found to correlate positively with two strategies, i.e., lexical guessing strategy #2;"analyze the structure of the word to guess its meaning" and a dictionary-use strategy #14; "looking up a new word in an internet dictionary", indicating a strong preference of these VLSs by ESP learners with high levels of self-esteem. On the other hand, low self-esteem correlated negatively with note-taking strategy #45; "noting the location where I have met the new word" and repetition strategy #54; "writing new words many times to memorize them", revealing that using

these vocabulary strategies was not considered useful by ESP learners with low esteem in the vocabulary learning process.

7. Learning Style and the Use of Vocabulary Learning Strategies

- **Research Question 1G**

Is there a relationship between ESP learners' learning style and overall use of vocabulary learning strategies?

With respect to the overall learning style preferences of ESP Greek university students, results revealed that they are predominantly visual (65.7%), introverted (63.9%), random-intuitive (71.1%), closure-oriented (75.3%), global (63%), synthesizing (71.4%), sharpener (64%), deductive (60.3%), field-independence (65.9%), reflective (71.3%) and metaphoric (62.4%).

Pearson's r correlation yielded a significant and positive relationship between overall VLS use and the synthesizing learning style ($r = 0.038$, $p < 0.05$), suggesting that ESP learners who process L2 learning material synthetically (e.g., summarize material well, enjoy guessing meanings, predicting outcomes and notice similarities quickly) tend to use VLS frequently more than learners displaying other learning styles in this sample.

A. Learning Style and use of VLS as categories

- **Research Questions 2G-8G**

Dictionary use strategies as a category was found to correlate significantly with the synthesizing learning style ($r = 0.11$, $p<0.05$). In contrast, the categories of lexical guessing strategies dictionary use, social-discovery, note-taking, repetition, association and consolidation were not found to significantly correlate with any learning styles exhibited by our ESP learners in this study.

B. Learning Style and the use of individual VLS

- **Research Questions 9G-15G**

Only four out of the eleven lexical guessing strategies included in our study were found to be significantly related to ESP learners' reported learning styles (RQ9G), i.e., (i) LG strategy #3 "trying to identify the grammatical category of the unknown word by focusing on the meaning of the sentence where it is" was significantly but negatively correlated with

the random learning style, (ii) LG strategy #4; "trying to guess the meaning of the word from its pronunciation, repeating it silently to myself" was found to significantly and positively correlated with the sharpener learning style, (iii) LG strategy #5; "I guess the meaning of the word by looking at the pictures accompanying the text" was found to correlate significantly and positively with the synthesizing learning style and (iv) LG strategy #8; "keep on reading and try to guess the meaning of the unknown word another time" was found to correlate significantly and positively with the metaphoric learning style.

Three dictionary use strategies were found to be significantly related to ESP learners' reported learning styles (RQ10G). Dictionary strategy #12; "I look up the word in a common or specialized bilingual (English-English) dictionary" and dictionary strategy #13; "I look up the word in a common or specialized monolingual (English-English) dictionary" correlated significantly and positively with the synthesizing learning style and with the random learning style respectively. A third dictionary use strategy #14, "I look up the word in a common or specialized bilingual or monolingual dictionary on the internet" was found to correlate significantly but negatively with the reflective learning style.

Out of the nine social-discovery strategies under examination in this study, five were found to be significantly related to the ESP learners' reported learning styles (RQ11G), i.e., (i) SC strategy #20; "I ask my classmates for a Greek translation of the new word" was found to strongly correlate positively with the global learning style, (ii) social-discovery strategy #23; "I ask my English teacher for a Greek translation of the new word" was correlated equally strongly and positively with the deductive learning style, (iii) SC strategies #21; "I ask my classmates for a definition of the new word in English" and #22; "I ask my classmates for the spelling/pronunciation of the new word in English" were both found to correlate negatively with the deductive style and positively with the synthesizing learning style. Together the deductive and synthesizing styles account for 52% of the variation in the use of the social-discovery strategy #21 and 54% of the variation in the use of the social-discovery strategy #22 and (iv) SC strategy #25; "I ask my English teacher for a sentence-example of the new word" was found to positively correlate with the introverted learning style but negatively with the closure-oriented learning style together accounting for 56% of the variation in the use of this strategy.

Ten note-taking strategies were found to be significantly related to ESP learners' reported learning styles (RQ12G): (i) a positively strong correlation was found between NT strategy #30 "I write down information

about new technical words in the margins of the textbook or where the word occurs" and the synthesizing learning style, which accounted for 45% of the variation in the use of this strategy. The same strategy also negatively correlate with the random learning style. All three learning styles accounted for 92% of the variation in strategy #30. (ii) NT strategy #40 "I write down example-sentences with the new technical word" was found to correlate strongly and positively with the introverted learning style but negatively with the random learning style. Together the two learning styles accounted for 91% of the variation in the use of note-taking strategy #40. (iii) NT strategy #41 "I write down the pronunciation of new technical words" was positively correlated with both the global and the synthesizing learning style but negatively with the deductive learning style. All three learning styles accounted for 89% of the variation in the use of note-taking strategy #41. (iv) NT strategy #42 "I write down the grammatical category of new technical words" positively correlated with the sharpener but negatively with the random learning style. Both learning styles accounted for 89% of the variation in the use of note-taking strategy #42. (v) NT strategy #51 "I use different devices to highlight the words I consider important" was positively correlated with the synthesizing learning style and, equally, strongly but negatively with the sharpener learning style. Both learning styles account for 38% of the variation in the use of note-taking strategy #51. (vi) NT strategy #31 "I write down information about new technical words on my English notebook" and strategy #50 "I write down the new words in the order I met them" were both negatively correlated with the synthesizing learning style. (vii) NT strategy #37 "I write down new technical words and their definitions in English" was negatively correlated with the random learning style, and (viii) NT strategy #32 "I write down information about new technical words in a specific vocabulary section at the end or top of my English notebook" and strategy #45 "I write down the contextual reference for the new word (e.g., page number, unit or lesson)" were both positively correlated with the synthesizing learning style and the visual learning style.

Five repetition strategies were found to be significantly related to ESP learners' reported learning styles (RQ14G). ASSOC strategies #55 "I listen to the words on an internet dictionary", #57; "I say the word and its Greek translation" and #58 "I repeat example-sentences of the word several times" were all found to yield significantly strong and positive correlations with the reflective learning style and the random learning style. ASSOC strategies #54 "I write the new word several times" and #60 "I repeat the spelling of the word several times, letter by letter" were

negatively correlated with the metaphoric learning style and the random learning style. Finally, two consolidation strategies were found to be significantly related to ESP learners' reported learning styles (RQ15G), i.e., CONS strategy #71 "I quiz myself or have others quiz me on new words" and #73 "I search for scientific articles on my subject of studies in English to practice and expand my technical vocabulary knowledge «and positively correlated with the visual and the reflective learning style.

4.3. Pedagogical Implications of the Study

Our study demonstrated an overall low use of vocabulary learning strategies by our ESP learners accompanied by low levels of reported self-regulation capacity and self-esteem indicating learners' inability to cope effectively with the vocabulary learning task as they do not possess the vocabulary strategy repertoire to successfully learn, consolidate and use new technical vocabulary closely related to the subject of their academic studies. Consequently, upon realization of their weak strategic behaviour in the ESP vocabulary learning process that is coupled with prior negative learning experiences within the EFL classroom in secondary and primary Greek education, our learners exhibit a low self-esteem, distress and a sense of unwillingness to expend the effort required in the English language learning process in tertiary education. Given the above, the direct pedagogical implications of our study for the ESP/EFL Greek learning classroom seem to point to the following four key areas of instructional intervention to remedy the situation:

- the integration of vocabulary learning strategy and self-regulation training programs conducted in a deeper way is viewed as a hope-based venture aiming toward greater learner autonomy and, eventually, enhancing language learning experiences (Oxford 2017, 37). Greek ESP learners need to be encouraged to develop a greater range of vocabulary learning strategies to be able to cope with their lexical difficulties and enrich their technical vocabulary knowledge along with the ability to think about the processes underlying their learning, and to see that, ultimately, they are responsible for their own vocabulary learning (Nunan 1995; Chamot 2017). A shift in the predominantly inexorably competitive and largely exam-oriented philosophy that traditionally permeates L2 language education in Greece towards learner-centeredness via the adoption of effective teaching practices to turn them into competent strategizers and

effective L2 autonomous learners is imperative (Zumbrunn et al. 2011).

- the introduction of SRL strategy instruction into the L2 classroom practices and formal education curricula to assist learners in autonomously regulating their studies while also equipping them with the necessary skills to sustain lifelong learning after completing their formal education (Boekaerts 1997). Becoming self-regulated can promote critical language learning strategies inside and outside the classroom, particularly for students with limited language learning experience. Relevant research suggests that language learning strategies are teachable and provide practical tasks for classroom instruction (e.g., Oxford 2011, Zimmerman 2000) as well as valuable examples of the positive influence of teacher training programs in fostering SRL implementation. Perry et al. (2002), for instance, demonstrated that when teachers are trained and assisted to promote SRL in their classes, they can (1) deploy frameworks enabling learner progression; (2) provide opportunities for student learning choices; (3) assist learners with instrumental and continuous support; and (4) utilize ongoing and encouraging evaluation. Equally, Ley and Young (2001) suggested four main principles for embedding SRL support in instruction to facilitate regulation in less expert learners, like learners in our study, where language teachers would have to guide learners to prepare and structure an effective learning environment, organize instruction and activities to facilitate cognitive and meta-cognitive processes, use instructional goals and feedback to present student monitoring opportunities, provide learners with continuous evaluation information and occasions to self-evaluate.
- the adoption of a Social-Emotional approach that promotes L2 learners' social and emotional intelligence increases their self-esteem and self-regulated learning aiming at training students in pursuing their own educational goals and surmounting obstacles (Habrat 2018). Supportive EFL/ESP instructors should strive for the establishment of warm and ingenuous relationships with their students, enabling them to overcome inhibitions that usually accompany a fragile sense of self-worth and safeguard learners' wellbeing throughout the L2 learning process (Oxford 2016). They should enable students to overcome inhibitions that usually accompany a fragile sense of self-worth. Following Habrat (2018, 135), a Foreign Language Self-Esteem approach should translate into providing sufficient, positive feedback and restraining from

humiliating remarks, motivating and complimenting students and using humour "for" rather than "against" them. If the teacher upholds mutual respect in the class community without allowing an incessant flow of empty praising but assesses the student fairly, indicating areas for improvement and offering guidance towards it, generally focusing more on learning than performance (Crocker et al 1999)., the individual learners will feel secure and unthreatened by criticism or ridicule. Students soon notice the difference between genuine feedback and empty praise, so comments that express individualized, thoughtful appreciation are far more worthy of notice. In sum, teacher dispositions and school climate play a tremendous role in the development of the positive sense of self (Helm 2007; Scott 1999).

- To incorporate an individualized learning approach in the implementation of L2 vocabulary strategy training programs. The findings of this study revealed few strong relationships between learning styles and the use of individual vocabulary strategies, pointing to some direct implications for the L2 classroom along the following lines: (a) teachers should use the appropriate instruments to identify their students' learning styles and vocabulary learning strategies and use the findings to adopt the most appropriate teaching style to adequately cater for their L2 learners' language needs (Oxford 2001; Cohen & Dornyei 2002). Obviously, if teachers become sensitive to their students' learning styles and balance their instruction by using a wide variety of tasks in the classroom, they will have treated the students equally. (b) Teachers should be equipped with several strategies to encourage their students to stretch their learning styles by helping them go 'beyond the stylistic comfort zone' (Oxford 2001, 361) to incorporate other beneficial learning styles in the L2 vocabulary learning process. If, for instance, one VL strategy does not work, they should be able to suggest an alternative or design activities that will require learners use a variety of strategies, and after the completion of the task, they should hold a discussion session with students talking about the strategies they used, whether these strategies proved useful or not. In this way, L2 learners will be given the opportunity to make self-evaluations, decide which is better for them or learn an alternative way of doing a particular task.

Findings of our study demonstrated an overall low use of vocabulary learning strategies by our ESP learners accompanied by low levels of

reported self-regulation capacity and self-esteem indicating learners' inability to cope effectively with the vocabulary learning task they are faced with as they do not possess the vocabulary strategy repertoire they need in order to successfully learn, consolidate and use new technical vocabulary closely related to the subject of their academic studies. Consequently, upon realization of their weak strategic behavior in the ESP vocabulary learning process that is coupled with prior negative learning experiences within the EFL classroom in secondary and primary Greek education, our learners exhibit a low self-esteem, distress and a sense of unwillingness to expend the effort required in the English language learning process in tertiary education. Given the above, the direct pedagogical implications of our study for the ESP/EFL Greek learning classroom seem to point to the following four key areas of instructional intervention to remedy the situation:

- the integration of vocabulary learning strategy and self-regulation training programs conducted in a deeper way and viewed as a hope-based venture aiming toward greater learner autonomy and, eventually enhanced language learning experiences (Oxford 2017, 37). Greek ESP learners need to be encouraged to develop a greater range of vocabulary learning strategies in order to be able to cope with their lexical difficulties and enrich their technical vocabulary knowledge along with the ability to think about the processes underlying their own learning, and to see that, ultimately, they are responsible for their own vocabulary learning (Nunan 1995; Chamot 2017). A shift in the predominantly inexorably competitive and largely exam-oriented philosophy that traditionally permeates L2 language education in Greece towards learner-centeredness via the adoption of effective teaching practices to turn them into competent strategizers and effective L2 autonomous learners is imperative (Zumbrunn et al 2011).
- the introduction of SRL strategy instruction into the L2 classroom practices and formal education curricula to assist learners in autonomously regulating their studies while also equipping them with the necessary skills to sustain lifelong learning after completing their formal education (Boekaerts 1997). Becoming self-regulated can promote critical language learning strategies inside and outside the classroom, particularly for students with limited language learning experience. Relevant research suggests that language learning strategies are teachable and provides practical tasks for classroom instruction (e.g. Oxford 2011, Zimmerman 2000) as well

as valuable examples of the positive influence of teacher training programs in fostering SRL implementation. Perry et al (2002), for instance, demonstrated that when teachers are trained and assisted to promote SRL in their classes, they can (1) deploy frameworks enabling learner progression; (2) provide opportunities for student learning choices; (3) assist learners with instrumental and continuous support; and (4) utilize ongoing and encouraging evaluation. Equally, Ley and Young (2001) suggested four main principles for embedding SRL support in instruction to facilitate regulation in less expert learners, like learners in our study, where language teachers would have to guide learners to prepare and structure an effective learning environment, organize instruction and activities to facilitate cognitive and meta-cognitive processes, use instructional goals and feedback to present student monitoring opportunities, provide learners with continuous evaluation information and occasions to self-evaluate.

- the adoption of a Social-Emotional approach that promotes L2 learners' social and emotional intelligence, increases their self-esteem and self-regulated learning aiming at training students in pursuing their own educational goals and surmounting obstacles (Habrat 2018). Supportive EFL/ESP instructors should strive for the establishment of warm and ingenuous relationships with their students enabling them to overcome inhibitions that usually accompany a fragile sense of self-worth and safeguard learners' well being throughout L2 learning process (Oxford 2016). They should enable students to overcome inhibitions that usually accompany a fragile sense of self-worth. Following Habrat (2018, 135), a Foreign Language Self-Esteem approach should translate into providing sufficient, positive feedback and restraining from humiliating remarks, motivating and complimenting students and using humour "for" rather than "against" them. If the teacher manages to teach mutual respect in the class community without restraining themselves to an incessant flow of empty praising but assesses the student fairly, indicating areas for improvement and offering guidance towards it, generally focusing more on learning than performance (Crocker et al 1999)., the individual learners will feel secure and unthreatened by criticism or ridicule. Students soon notice the difference between genuine feedback and empty praise, so comments that express individualized, thoughtful appreciation are far more worthy of notice. All things considered, teacher

dispositions and school climate play a tremendous role in the development of the positive sense of self (Helm 2007; Scott 1999).

- the incorporation of an individualized learning approach in the implementation of L2 vocabulary strategy training programs. The findings of this study revealed few strong relationships between learning styles and the use of individual vocabulary strategies pointing to some direct implications for the L2 classroom along the following lines: (a) teachers should use the appropriate instruments to identify their students' learning styles and vocabulary learning strategies and make use of these findings to adopt the most appropriate teaching style to cater adequately for their L2 learners' language needs (Oxford 2001; Cohen & Dörnyei 2002). Obviously, if teachers become sensitive to their students' learning style and balance their instruction by making use of a wide variety of tasks in the classroom, they will have treated the students equally. (b) Teachers should be equipped with a lot of strategies to encourage their students stretch their learning styles by helping them go 'beyond the stylistic comfort zone' (Oxford 2001, 361) and try to incorporate other beneficial learning styles in the L2 vocabulary learning process. If, for instance, one VL strategy does not work they should be able to suggest another alternative or design activities that will require learners to make use of a variety of strategies and after the completion of the task they should hold a discussion session with students talking about the strategies they make use, whether these strategies proved to be useful or not. In this way, L2 learners will be given the opportunity to make self-evaluations, decide which is better for them, or learn an alternative way of doing a particular task.

4.4. Recommendations for Further Research

Following Seliger and Shohamy (1989, 254), "the nature of this research is cyclical; it is as a recurrent sequence of events … 'the more answers are obtained, the more questions arise". This is true in the sense that we do not always manage to describe a phenomenon with a single study but with a series of them.

Hence, what follows is a set of recommendations for further research, which can be conducted either on the effect of self-regulatory capacity, self-esteem and learning styles on VLS use or on the influence of other situational and learner factors on VLS.

1. The adapted version of the VLS-Q used in the study was grounded on a sample of L2 learners with a specific educational background and all majoring in the Faculty of Agricultural and Forestry Sciences. Future research should be conducted to test the reliability of the VLS-Q with university students of different disciplines as well as with Greek EFL students in primary and secondary education. Once the reliability of the VLS-Q is ensured through potential modifications, it may be used as an indicator of what VLS students claim to use. This could be used to detect the VLS areas in which training may be worth implementing (see 5.4. for teaching implications) in the Greek EFL class.
2. Our study attempted to explore the role of self-regulating capacity in vocabulary learning in quantitative terms via the use of Tseng et al's (2006) SRCvoc scale that integrates the investigation of strategic behaviours in vocabulary learning into the broader context of self-regulated learning. While this scale continues to gain popularity, there remains a significant concern with the use of the SRCvoc as a measure of overall capacity for self-regulated learning (Mizumoto and Takeuchi 2012) whether it actually measures the strategic behaviours characteristic of the performance phase of the self-regulated learning cycle. It thus suggests that future researchers wishing to investigate student capacity for the broader concept of self-regulated learning within the context of foreign language acquisition should include measures of motivational characteristics of self-regulated learners, such as the MSLQ, as well as measures of strategic behaviours characteristic of the other two phases of the self-regulated learning cycle (Cleary 2011). Additional exploratory qualitative research of a longitudinal kind should be conducted in different instructional contexts and with different L2 proficiency levels aiming to determine the changes in wider aspects of self-regulated vocabulary learning of the same L2 learners across their school years. Case studies and online methods such as think-aloud might also prove helpful in this respect.
3. Another recommendation is concerned with the study of self-esteem and its effect in relation to VLS use in L2 learning contexts. Our findings revealed a restricted contribution of our L2 learners' level self-esteem to their self-reported VLS use in this study, paving the way for two areas where future research could possibly extend, i.e., (i) there is a pressing need for the design and validation of a Foreign Language Scale of Self-esteem (FLSE) for data-gathering purposes across a wide variety of different L2 contexts

involving language learners of various educational and cultural background and different language learning needs. Using such quantitative data collected via a reliable instrument would enable researchers to determine students' self-esteem level as L2 learners in relation to effective and successful VLS use in their respective tasks. (ii) Obtaining data by means of multimodal methods might also be a promising undertaking as it is believed that quantitative and qualitative data collection methods and triangulation would help capture different dimensions of L2-related representations of the self and cross-validate the results (Piechurska-Kuciel 2008).

4. Research on learning styles for inclusion into vocabulary learning strategy training modules seems to be equally imperative in the face of the scarcity of relevant empirical research in the area. Vocabulary learning strategy training based on learning styles would prepare instructors for which kinds of strategies should be taught and how to deal with learners of different learning styles. Based on the belief that mixed method research on learning styles can provide teachers with an understanding of students and how they learn, EFL and ESP teachers will need research instruments specifically-tailored to language learning and appropriate to the range of cultural and linguistic backgrounds of the target populations. In order to gain better insights into the learning processes of individuals (Vann and Abraham 1990), researchers need to rely on different elicitation instruments and varied research approaches, as no single instrument or approach can provide a truly complete and accurate picture of a learner's learning style preferences.

In sum, the exploratory nature of the investigation leaves room for further research, whose recommendations have been outlined above. Through the contribution of this research to the field of L2 vocabulary acquisition, we implore future research to consider the self-regulation, self-esteem and learning styles as possible determinants of VLS to elucidate the role of each one of these constructs in relation to VLS use and address their interactive effects in VLS use and effectiveness in the L2 vocabulary acquisition process in ESP and EFL contexts as there is little to offer in this area (see section 2.3.). Process-oriented research will particularly be conducive to this end, focusing on describing the mechanisms underlying self-regulation, self-esteem and learning style, and successful VLS use.

APPENDICES

Appendix A

Vocabulary Learning Strategies Questionnaire in English

SECTION I Dealing with unknown technical vocabulary.

How I guess the meaning of new words.

1. I check if the word looks similar to Greek. (e.g. hydrology, agronomy)
0_____1
2. I analyze the structure of the word or parts of the word. (e.g. hygro+meter)
0_____1
3.I analyze the grammatical category of the word by looking at the sentence. (e.g. noun, verb, adjective)
0_____1
4. I guess the meaning of the word by its sound, e.g. I say it aloud and guess.
0_____1
5. I guess the meaning by looking at the pictures accompanying the text.
0_____1
6. I guess the meaning with the help of the words I know in the sentence or paragraph.
0_____1
7. I guess the meaning by the topic of the text in which the word appears.
0_____1
8. I keep on reading and try to guess later on from the context.
0_____1
9. I skip the word if I do not manage to guess the meaning.
0_____1
10. I can easily identify words that constitute the technical terminology as they are closely related to my subject of studies.
0_____1

11. I can easily identify when a common word has a second specialized meaning that is related to the subject of my studies. (e.g. **down** = καλύπτρα σπόρου, **bank** = όχθη ποταμού).
0_____1

How I use dictionaries and other sources.

12. I look up the word in a common or specialized bilingual (English-Greek) dictionary.
0_____1
13. I look up the word in a common or specialized monolingual (English-English) dictionary.
0_____1
14. I look up the word in a common or specialized bilingual or monolingual dictionary on the internet.
0_____1
15. I look up the word in the dictionary and check its meaning(s).
0_____1
16. I look up the word in the dictionary and check its pronunciation.
0_____1
17. I look up the word in the dictionary and check its spelling.
0_____1
18. I look up the word in the dictionary and check its grammatical category.
0_____1
19. I look up the word in the dictionary and check example-sentences.
0_____1

Who I ask and what information I request

20. I ask my classmates for a Greek translation of the new word.
0_____1
21. I ask my classmates for a definition of the new word in English.
0_____1
22. I ask my classmates for the spelling or pronunciation of the new word.
0_____1

23. I ask my English teacher for a Greek translation of the new word.
0_____1
24. I ask my English teacher for a definition of the new word in English
0_____1

25. I ask my English teacher for a example-sentence of the new word
0_____1
26. I ask my English teacher for the spelling or pronunciation of the new word
0_____1
27. I ask my English teacher for the word's use (i.e. how and when it can be used appropriately).
0_____1
28. I ask my English teacher for the grammar of the word (e.g. species – only in plural).
0_____1

SECTION II Taking Vocabulary Notes.

Places where I keep vocabulary notes (and any information about them)

29. I write down information about new technical words next to each unit in my textbook.
0_____1
30. I write down information about new technical words in the margins of the textbook or where the word occurs.
0_____1
31. I write down information about new technical words on my English notebook (i.e. the one I use for my English course.
0_____1
32. I write down information about new technical words in a specific vocabulary section at the end or top of my English notebook.
0_____1
33. I write down information about new technical words on a notebook I use for other courses too.
0_____1
34. I write down information about new technical words on small pieces of paper (post-it), which I stick somewhere at home.
0_____1
35. I keep vocabulary notes in a computer, laptop, ipad or other electronic devices.
0_____1

Kind of information I record about new words

36. I write down new words and their Greek translation.
0_____1
37. I write down new words and their definitions in English.
0_____1
38. I write down new words antonyms or synonyms beside new technical words.
0_____1
39. I write down the multiple meanings of new technical words. (π.χ.dormancy, furnish, pad, blight).
0_____1
40. I write down example sentences using the new technical word.
0_____1
41. I write down the pronunciation of new technical words
0_____1
42. I write down the grammatical category of new technical words.
0_____1
43. I write down the grammatical behavior/pattern of new words. (π.χ. provide for, participate in)
0_____1
44. I write down information about the appropriate context or situation in which the word can be used.
0_____1
45. I write down the contextual reference for the new word (e.g. page number, unit or lesson).
0_____1

How I organize my notes about new words

46. I organize new words by unit or lesson of the textbook.
0_____1
47. I classify new words into their grammatical category (e.g. verbs in one section, nouns in another).
0_____1
48. I classify new words by meaning groups, (e.g. words related to flower morphology, farm machinery)
0_____1
49. I organize new words by alphabetical order or sections (i.e. words beginning with A in one section, with B, etc).
0_____1

50. I write down new words in the order I meet them.
0_____1
51. I use different devices to highlight the words I consider important (e.g. capital letters, coloured pens or markers, asterisks, lines, etc)
0_____1

SECTION III Memorising/Retaining Vocabulary

Things I do to help myself retain new words

A. Ways I do repetition
52. I say the word aloud several times.
0_____1
53. I repeat the word silently in my mind.
0_____1
54. I write the word several times.
0_____1
55. I listen to the words on an internet dictionary.
0_____1
B. Information that I handle repeatedly
56. I just repeat the English words alone.
0_____1
57. I say the word and its Greek translation.
0_____1
58. I repeat example sentences several times.
0_____1

59. I repeat the word and its English definition.
0_____1
60. I repeat the spelling of the word several times, letter by letter.
0_____1

Things I do to help myself retain new words

61. I relate new words to other English words with similar sounds or spelling (π.χ.employ-deploy)
0_____1
62. I relate the new words to antonyms (e.g. maximize ≠ minimize) or synonyms (π.χ. provide-supply) in English.
0_____1

63. I associate new words with similar words in another foreign language I have studied.
0_____1
64. I associate new words with similar words in Greek.
0_____1
65. I use the Keyword Method. (e.g. if I want to memorise the word 'trigger,' I think of a word in Greek that sounds similar like 'τρύγος'(=grape harvesting) then I create an image of a gun that I found in a vineyard.
0_____1
66. I relate new words to words which usually go together in speech or writing in technical texts. (e.g. shed leaves)
0_____1
67. I associate new words with semantically related words or group of words (e.g. vocabulary on flower morphology)
0_____1
68. I visualize the written form (spelling) or the meaning of new words.
0_____1
69. I associate new words with the place I see or hear them (e.g. books, articles, lectures)
0_____1
70. I think of the prefixes and/or suffixes that can be attached to the new word. (e.g.**uni**locular, **inter**cellular, metabol**ic**)
0_____1

What I do to practice/consolidate new words

71. I quiz myself or have other quiz me on new words (e.g. playing memory games)
0_____1
72. I write small paragraphs (e.g. summaries) where I use the new technical words I have learnt.
0_____1
73. I search for scientific articles on the subject of my studies in English (either at the university library or on the internet) to practice and expand the new technical words I have learnt.
0_____1
74. I watch English documentaries with subtitles in English on the subject of my studies to enrich my knowledge of technical terminology.
0_____1

75. I listen to lectures and speeches in English on the internet to expand my knowledge of the technical terminology I learn.
0_____1

Appendix B

Self-Esteem Questionnaire in English (Hasan, 2001)

- **1.** My ability to learn the foreign language (FL) is high.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **2.** I express myself freely in the foreign language.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **3.** I have a problem with some grammatical rules when writing in the foreign language.
rongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **4.** I participate effectively in the foreign language (FL) discussion.
Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **5.** I can speak the foreign language (FL) very well.
Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **6.** My understanding of what others say in the foreign language (FL) is limited.
Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **7.** I speak the foreign language (FL) with a heavy foreign accent.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **8.** I have some foreign language (FL) reading habits.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **9.** I can write very well in the foreign language.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **10.** I feel good about myself when speaking in the foreign language (FL) classroom.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree
- **11.** I feel happy when I am with my foreign language (FL) classmates.
  Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **12.** I can read very well in the foreign language.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **13.** I don't feel at ease when I talk to my foreign language (FL) instructors.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **14.** I find difficulty talking in the foreign language (FL) in front of my classmates.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **15.** My classmate are better foreign language (FL) learners than me.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **16.** My foreign language (FL) instructors have high expectations of me.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **17.** My foreign language (FL) classmates do not like me.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **18.** I can understand the foreign language (FL) very well.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **19.** I am always attentive to my foreign language (FL) instructors.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **20.** I attend the foreign language (FL) class sessions on time.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **21.** I volunteer myself for any foreign language (FL) classroom activities.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **22.** I miss many foreign language (FL) class sessions.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **23.** I avoid any discussions in the foreign language.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **24.** I read for pleasure in the foreign language.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

- **25.** I reluctantly participate in the foreign language (FL) classroom activities.

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

Appendix C

The Learning Style Analysis Survey in English (Cohen et al, 2001)

The Learning Style Survey is designed to access your general approach to learning. It does not predict your behavior in every instance, but it is a clear indication of your overall style preferences. For each item, circle the response that represents your approach. Complete all items. There are 11 major activities representing 12 different aspects of your learning style. When you read the statements, try to think about what you usually do when learning. It typically takes about 30 minutes to complete the survey. Do not spend too much time on any item – indicate your immediate feeling and move on to the next item.

For each item, circle your response: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always

Part1: How I Use My Physical Senses

1. I remember something better if I write it down.	0 1 2 3 4
2. I take detailed notes during lectures.	0 1 2 3 4
3. When I listen, I visualize pictures, numbers, or words in my head.	0 1 2 3 4
4. I prefer to learn with TV or video rather than other media.	0 1 2 3 4
5. I use color-coding to help me as I learn or work.	0 1 2 3 4
6. I need written directions for tasks.	0 1 2 3 4
7. I have to look at people to understand what they say.	0 1 2 3 4
8. I understand lectures better when professors write on the board.	0 1 2 3 4
9. Charts, diagrams, and maps help me understand what someone says.	0 1 2 3 4
10. I remember peoples' faces but not their names.	0 1 2 3 4
A – Total _____	

11. I remember things better if I discuss them with someone.	0 1 2 3 4
12. I prefer to learn by listening to a lecture rather than reading.	0 1 2 3 4
13. I need oral directions for a task.	0 1 2 3 4
14. Background sound helps me think.	0 1 2 3 4
15.I like to listen to music when I study or work.	0 1 2 3 4
16. I can understand what people say even when I cannot see them.	0 1 2 3 4
17. I remember peoples' names but not their faces.	0 1 2 3 4
18. I easily remember jokes that I hear.	0 1 2 3 4
19. I can identify people by their voices (e.g. on the phone).	0 1 2 3 4
20. When I turn on the TV, I listen to the sound more than I watch the screen.	0 1 2 3 4

B – Total _____

21. I prefer to start doing things rather than checking the directions first.	0 1 2 3 4
22. I need frequent breaks when I work or study.	0 1 2 3 4
23. I need to eat something when I read or study.	0 1 2 3 4
24. If I have a choice between sitting and standing, I'd rather stand.	0 1 2 3 4
25. I get nervous when I sit still too long.	0 1 2 3 4
26. I think better when I move around (e.g. pacing or tapping my feet).	0 1 2 3 4
27. I play with or bite on my pens during lectures.	0 1 2 3 4
28. Manipulating objects helps me to remember what someone says.	0 1 2 3 4
29. I move my hands when I speak.	0 1 2 3 4
30. I draw lots of pictures (doodles) in my notebook during lectures.	0 1 2 3 4

C – Total _____

Part2: How I Use Expose Myself To Learning Situations

1. I learn better when I work or study with others than by myself.	0 1 2 3 4
2. I meet new people easily by jumping into the conversation.	0 1 2 3 4
3.I learn better in the classroom than with a private tutor.	0 1 2 3 4
4. It is easy for me to approach strangers.	0 1 2 3 4
5.Interacting with lots of people gives me energy.	0 1 2 3 4
6. I experience things first and then try to understand them.	0 1 2 3 4

A – Total _____

7. I am energized by the inner world (what I'm thinking inside).	0 1 2 3 4
8. I prefer individual or one-on-one games and activities.	0 1 2 3 4
9. I have a few interests, and I concentrate deeply on them.	0 1 2 3 4
10. After working in a large group, I am exhausted.	0 1 2 3 4
11. When I am in a large group, I tend to keep silent and listen.	0 1 2 3 4
12. I want to understand something well before I try it.	0 1 2 3 4

B – Total _____

Part 3: HOW I HANDLE POSSIBILITIES

1. I have a creative imagination.	0 1 2 3 4
2. I try to find options and possibilities for why something happens.	0 1 2 3 4
3. I plan carefully for future events.	0 1 2 3 4
4. I like to discover things myself rather than have everything explained to me.	0 1 2 3 4
5. I add many original ideas during class discussions.	0 1 2 3 4
6. I am open-minded to new suggestions from my peers.	0 1 2 3 4

A – Total _____

7. I focus on a situation as it is rather than thinking about how it could be.	0 1 2 3 4
8. I read instruction manuals (e.g., for computers or VCRs) before using the device.	0 1 2 3 4
9. I trust concrete facts instead of new, untested ideas.	0 1 2 3 4
10. I prefer things presented in a step-by-step way.	0 1 2 3 4
11. I dislike it if my classmate changes the plan for our project.	0 1 2 3 4
12. I follow directions carefully.	0 1 2 3 4

B – Total _____

Part 4: How I Deal With Ambiguity and With Deadlines

1. I like to plan language study sections carefully and do lessons on time or early.	0 1 2 3 4
2. My notes, handouts, and other school materials are carefully organized.	0 1 2 3 4
3. I like to be certain about what things mean in a target language.	0 1 2 3 4
4. I like to know how rules are applied and why.	0 1 2 3 4

A – Total _____

5. I let deadlines slide if I'm involved in other things.	0 1 2 3 4
6. I let things pile up on my desk to be organized eventually.	0 1 2 3 4
7. I don't worry about comprehending everything.	0 1 2 3 4
8. I don't feel the need to come to rapid conclusions about a topic.	0 1 2 3 4

B – Total _____

Part 5: How I Receive Information

1. I prefer short and simple answers rather than long explanations.	0 1 2 3 4
2. I ignore details that do not seem relevant.	0 1 2 3 4
3. It is easy for me to see the overall plan or big picture.	0 1 2 3 4
4. I get the main idea, and that's enough for me.	0 1 2 3 4
5. When I tell an old story, I tend to forget lots of specific details.	0 1 2 3 4

A – Total _____

6. I need very specific examples in order to understand fully.	0 1 2 3 4
7. I pay attention to specific facts or information.	0 1 2 3 4
8. I'm good at catching new phrases or words when I hear them.	0 1 2 3 4
9. I enjoy activities where I fill in the blank with missing words I hear.	0 1 2 3 4
10. When I try to tell a joke, I remember details but forget the punch line.	0 1 2 3 4

B – Total _____

Part 6: How I Further Process Information

1. I can summarize information easily.	0 1 2 3 4
2. I can quickly paraphrase what other people say.	0 1 2 3 4
3. When I create an outline, I consider the key points first.	0 1 2 3 4
4. I enjoy activities where I have to pull ideas together.	0 1 2 3 4
5. By looking at the whole situation, I can easily understand someone.	0 1 2 3 4

A – Total _____

6. I have a hard time understanding when I don't know every word.	0 1 2 3 4
7. When I tell a story or explain something, it takes a long time.	0 1 2 3 4
8. I like to focus on grammar rules.	0 1 2 3 4
9. I'm good at solving complicated mysteries and puzzles.	0 1 2 3 4
10. I'm good at noticing even the smallest details involved in a task.	0 1 2 3 4

B – Total _____

Part 7: HOW I COMMIT MATERIAL TO MEMORY

1. I try to pay attention to all the features of new material as I learn.	0 1 2 3 4
2. When I memorize different bits of language material, I can retrieve these bits – as if I had stored them in separate slots in my brain.	0 1 2 3 4
3. As I learn new material in the target language, I make fine distinctions among speech sounds, grammatical forms, and words and phrases.	0 1 2 3 4

A – Total _____

4. When learning new information, I may clump together data by eliminating or reducing differences and focusing on similarities.	0 1 2 3 4
5. I ignore distinctions that would make what I say more accurate in the given context.	0 1 2 3 4
6. Similar memories become blurred in my mind; I merge new learning experiences with previous ones.	0 1 2 3 4

B – Total _____

Part 8: HOW I DEAL WITH LANGUAGE RULES

1.I like to go from general patterns to the specific examples in learning a target language.	0 1 2 3 4
2. I like to start with rules and theories rather than specific examples.	0 1 2 3 4
3.I like to begin with generalizations and then find experiences that relate to those generalizations.	0 1 2 3 4

A – Total _____

4. I like to learn rules of language indirectly by being exposed to examples of grammatical structures and other language features.	0 1 2 3 4
5. I don't really care if I hear a rule stated since I don't remember rules very well anyway.	0 1 2 3 4
6. I figure out rules based on the way I see language forms behaving over time.	0 1 2 3 4

B – Total _____

Part 9: How I Deal With Multiple Inputs

1. I can separate out the relevant and important information in a given context even when distracting information is present.	0 1 2 3 4
2. When I produce an oral or written message in the target language, I make sure that all the grammatical structures are in agreement with each other	0 1 2 3 4
3. I not only attend to grammar but check for appropriate levels of formality and politeness.	0 1 2 3 4

A – Total _____

4. When speaking or writing, I feel that focusing on grammar is less important that paying attention to the content of the message.	0 1 2 3 4
5. It is a challenge for me to both focus on communication in speech or writing while at the same time paying attention to grammatical agreement (e.g., person, number, tense, or gender).	0 1 2 3 4
6. When I am using lengthy sentences in a target language, I get distracted and neglect aspects of grammar and style.	0 1 2 3 4

B – Total _____

Part 10: How I Deal With Response Time

1. I react quickly in language situations.	0 1 2 3 4
2. I go with my instincts in the target language.	0 1 2 3 4
3. I jump in, see what happens, and make corrections if needed.	0 1 2 3 4

A – Total _____

4. I need to think things through before speaking or writing.	0 1 2 3 4
5. I like to look before I leap when determining what to say or write in a target language.	0 1 2 3 4
6. I attempt to find supporting material in my mind before I set about producing language.	0 1 2 3 4

B – Total _____

Part 11: HOW LITERALLY I TAKE REALITY

1. I find that building metaphors in my mind helps me deal with language (e.g. viewing the language like a machine with component parts that can be disassembled)	0 1 2 3 4
2. I learn things through metaphors and associations with other things. I find that stories and examples help me learn.	0 1 2 3 4

A – Total _____

4. I take learning language literally and don't deal in metaphors.	0 1 2 3 4
5. I take things at face value, so I like language material that says what it means directly.	0 1 2 3 4

B – Total _____

Appendix D

Self-Regulating Capacity in Vocabulary Learning Questionnaire (SRCvoc) in English (Tseng et al, 2006)

- **1.** Once the novelty of learning vocabulary is gone, I easily become impatient with it.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **2.** When I feel stressed about vocabulary learning, I know how to reduce this stress.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **3.** When I am studying vocabulary and the learning environment becomes unsuitable, I try to sort out the problem.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **4.** When learning vocabulary, I have my special techniques to achieve my learning goals.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **5.** When learning vocabulary, I have my special techniques to keep my concentration focused.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **6.** I feel satisfied with the methods I use to reduce the stress of vocabulary learning.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **7.** When learning vocabulary, I believe I can achieve my goals more quickly than expected.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **8.** During the process of learning vocabulary, I feel satisfied with the ways I eliminate boredom.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **9.** When learning vocabulary, I think my methods of controlling my concentration are effective.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **10.** When learning vocabulary, I persist until I reach the goals that I make for myself.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **11.** When it comes to learning vocabulary, I have my special techniques to prevent procrastination.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **12.** When I feel stressed about vocabulary learning, I simply want to give up.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **13.** I believe I can overcome all the difficulties related to achieving my vocabulary learning goals.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **14.** When learning vocabulary, I know how to arrange the environment to make learning more efficient.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **15.** When I feel stressed about my vocabulary learning, I cope with this problem immediately.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **16.** When it comes to vocabulary learning, I think my methods of controlling procrastination are effective.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **17.** When learning vocabulary, I am aware that the learning environment matters.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **18.** During the process of learning vocabulary, I am confident that I can overcome any sense of boredom.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **19.** When feeling bored with learning vocabulary, I know how to regulate my mood in order to invigorate the learning process.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

- **20.** When I study vocabulary, I look for a good learning environment.

Strongly Agree Agree Partly Agree Slightly Disagree Disagree Strongly Disagree

Appendix E

Nation's Vocabulary Levels Test

Vocabulary Levels Test
Academic Version

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning. Here is an example.

1. business
2. clock
3. horse
4. pencil
5. shoe
6. wall

_____part of a house
_____animal with four legs
_____something used for writing

You answer it in the following way.

1.business

1. clock
2. horse
3. pencil
4. shoe
5. wall

_**6**____part of a house
_**3**____animal with four legs
_**4**____something used for writing

1.area	_____written
2.contract	agreement.
3.definition	_____way of doing
4.evidence	something.
5.method	_____reason for
6.role	believing something is or is not true.

1.construction	____safety.
2.feature	___ noticeable part of
3. impact	something.
4. institute	_____organization
5. region	which has a special
6. security	purpose.

1.debate	_____plan.
2.exposure	_____choice.
3.integration	_____joining
4.option	something into a whole.
5.scheme	
6.stability	

1.access	_____male or female.
2.gender	_____study of the
3.implementation	mind.
4.license	_____entrance or way
5.orientation	in.
6.psychology	

1.accumulation	_____collecting
2.edition	things overtime.
3.guarantee	_____promise to
4.media	repair a broken product.
5.motivation	_____feeling a strong
6.phenomenon	reason or need to do something.

1.adult	_____end.
2.exploitation	_____
3.infrastructure	_____machine
4.schedule	used to move people or
5.termination	goods.
6.vehicle	_____list of things to do at certain times.

1.alter	_____change.
2.coincide	_____say something
3.deny	is not true.
4.devote	_____describe clearly
5.release	and exactly.
6.specify	

1.convert	_____keep out.
2.design	_____stay alive.
3.exclude	_____change from
4.facilitate	one thing into another.
5.indicate	
6.survive	

1.bond	_____make smaller.
2.channel	_____guess the
3.estimate	number or size of
4.identify	something.
5.mediate	_____recognizing and
6.minimize	naming a person or thing.

1.explicit	_____last.
2.final	_____stiff.
3.negative	_____meaning
4.professional	‘no’ or ‘not’.
5.rigid	
6.sole	

1.analogous	_____happening
2.objective	after.
3.potential	_____most important.
4.predominant	_____not influenced
5.reluctant	by personal opinions.
6. subsequent	

1.abstract	____next to.
2.adjacent	____added to.
3.controversial	____concerning the
4.global	whole world.
5.neutral	
6.supplementary	

Appendix F

Overall Use of VLS in order of Frequency

Rank	No. & Name of VLS	N	Mean	Std. Deviation
1.	**6.** I use the words in the sentence and/or paragraph to guess the meaning of an unknown word.	**297**	5.4916	1.27903
2.	**36.** I write down the Greek translation of a technical word.	**297**	5.2458	1.60558
3.	**14.** I use an online dictionary to check the meaning of a word.	**297**	5.1852	1.69739
4.	**1.** I check if the new word looks like a Greek word.	**297**	5.1111	1.67789
5.	**7.** I rely on the text to understand the meaning of a word.	**297**	4.8990	1.75431
6.	**29.**I keep notes of the new vocabulary in every class session.	**297**	4.8754	1.78620
7.	**57.**I repeat new words along with their Greek translations	**297**	4.8148	1.91968
8.	**15.**Use dictionary to check meaning (s).	**297**	4.7879	1.87231
9.	**17.**Use dictionary to check spelling.	**297**	4.7643	1.85587
10.	**19.**Use dictionary to check how new words are used in sentences.	**297**	4.7003	1.93678
11.	**31.**Keep vocabulary notes in a specific textbook just for this purpose	**297**	4.6465	2.03340
12.	**8.**Go on reading and try to guess at the meaning of the new word another time	**297**	4.6061	1.97528
13.	**54.**Memorize words by writing them many times	**297**	4.5219	2.10863
14.	**51.**Use different ways to highlight important new words	**297**	4.4242	2.17366
15.	**23.**Ask my teacher for the Greek translation of a new word	**297**	4.3434	2.04920
16.	**68.** Memorize the spelling of new words	**297**	4.2391	2.09248

17.	**46.**Keep vocabulary notes based on units or class sessions	**297**	4.2222	2.19746
18.	**3.**Try to identify the grammatical category of a new word	**297**	4.2155	2.17029
19.	**39.**Keep notes of multiple meanings of new words	**297**	4.1448	2.16606
20.	**53.**Repeat new words silently to myself	**297**	4.1077	2.18607
21.	**64.**I associate new words to similar words in Greek	**297**	4.1010	2.14111
22.	**30.**Keep vocabulary notes on the margins of my book	**297**	4.0943	2.18669
23.	**24.**Ask my teacher for the definition of a new word in English	**297**	4.0505	2.21195
24.	**2.**Analyze the structure of the word	**297**	4.0202	2.19018
25.	**12.**Look up the new word in a bilingual dictionary	**297**	4.0101	2.24735
26.	**56.**Repeat the new words alone	**297**	3.9966	2.17401
27.	**9.**Skip the new word	**297**	3.9899	2.23680
28.	**50.**Keep notes of the new words in every text I meet them	**297**	3.9428	2.19184
29.	**37.**Keep notes of the new words along with their definitions in English	**297**	3.7946	2.22127
30.	**5.**Look at pictures in the text to help me guess the meaning of new words	**297**	3.6835	2.22869
31.	**25.**Ask my teacher for a sentence-example to understand how the new word is used	**297**	3.6195	2.24963
32.	**26.** Ask my teacher for the pronunciation/spelling of the new word	**297**	3.5993	2.16648
33.	**10.**Identify easily the technical vocabulary in texts	**297**	3.5993	2.02294
34.	**52.**Repeat new words aloud	**297**	3.5623	2.34744
35.	**4.** Guess the meaning of new words from their pronunciation	**297**	3.4916	2.30615

36.	**74.**Watch English documentaries to enrich my technical vocabulary knowledge	**297**	3.4579	2.32911
37.	**20.**Ask my fellow students for the Greek translation of technical vocabulary	**297**	3.4411	2.24904
38.	**69.** Associate new technical words with the location where I see them	**297**	3.4343	2.27276
39.	**11.** Identify the semi-technical words	**297**	3.3973	2.18650
40.	**43.**Keep notes of the syntax of new words	**297**	3.3603	2.24545
41.	**27.** Ask my teacher how I can use a new technical word in speaking/writing	**297**	3.3131	2.20555
42.	**32.** Keep notes of new technical words in a specific section in my notebook	**297**	3.2963	2.30300
43.	**28.** Ask my teacher for the grammar of a new word	**297**	3.2929	2.22358
44.	**16.**Check the pronunciation of a new word in a dictionary	**297**	3.2559	2.17988
45.	**75.** Attend speeches/lectures in English to enrich my technical vocabulary knowledge	**297**	3.2424	2.25003
46.	**18.**Check the grammar of new words in a dictionary	**297**	3.2222	2.15084
47.	**67.** Associate new words with others in a semantic set	**297**	3.2222	2.19438
48.	**13.**Look up new words in a monolingual dictionary	**297**	3.2121	2.20996
49.	**62.** Associate new words with their synonyms/antonyms.	**297**	3.1313	2.17936
50.	**66.**Associate new words with their collocations	**297**	3.1178	2.14577
51.	**60.** Repeat the spelling of new words many times	**297**	3.0707	2.22054
52.	**59.** Repeat the new words along with their definitions in English	**297**	2.9798	2.20095
53.	**38.** Keep notes of antonyms/synonyms of new words.	**297**	2.9394	2.20174

54.	**45.** Keep notes of where I have met the new word	**297**	2.8721	2.22481
55.	**70.** Think of prefixes/suffixes can be added to the new word	**297**	2.8485	2.19350
56.	**21.** Ask me fellow students for an English definition of the new word	**297**	2.8418	2.14000
57.	**22.**Ask my fellow students for the spelling/pronunciation of the new word	**297**	2.8047	2.20156
58.	**63.** Associate new words in English with similar words in another foreign language	**297**	2.7845	2.20274
59.	**58.** Repeat new words in sentences-examples several times	**297**	2.7710	2.13911
60.	**55.** Listen to the pronunciation of a new word in an online dictionary	**297**	2.7475	2.19494
61.	**33.** Keep vocabulary notes in a notebook I use for other subjects	**297**	2.6801	2.18457
62.	**65.** I use the Keyword method	**297**	2.6532	2.21427
63.	**44.**Keep notes of how new words can be used correctly	**297**	2.6532	2.04781
64.	**61.** Associate the spelling of new words with other words of similar sound or spelling	**297**	2.6330	2.10292
65.	**40.** Keep notes of new words in sentences-examples	**297**	2.6364	2.07684
66.	**71.** Test myself or have others test my vocabulary knowledge	**297**	2.4646	2.05981
67.	**35.** Keep vocabulary notes on an electronic device	**297**	2.4074	2.04651
68.	**42.** Keep notes of the grammatical category of new words	**297**	2.3266	1.93590
69.	**41.** Keep notes of the pronunciation of new words	**297**	2.3030	1.90015
70.	**48.** Classify new words based on topics when keeping notes	**297**	2.2189	1.92492
71.	**73.** Search for more scientific texts to expand my vocabulary knowledge	**297**	1.9764	1.78851
72.	**49.** Keep notes of the new words alphabetically	**297**	1.8788	1.71799

73.	**47.** Classify new words based on their grammatical category when keeping notes	**297**	1.8586	1.69863
74.	**34.** Keep notes in small cards to learn new words	**297**	1.8114	1.68202
75.	**72.** Write summaries using the new words.	**297**	1.6667	1.52014

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