

e-Vocabulary Learning Strategies of ESL Learners: An Exploratory Study

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BY

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A. Publications

- a. Kotturi Krishna Swamy (2020) "Online Semantic Mapping Strategies for Augmenting Retention of Lexical Fields: Applying Theory into Online Practices"
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Abstract

Over the past three decades, extensive research has been conducted on vocabulary learning strategies (VLS), finding its base on language learning strategies (LLS). Through such research, the nuances of complex vocabulary learning processes were identified as VLS. However, there were hardly any studies conducted in a contemporary Information and Communication Technology (ICT) enhanced classroom environment, which has been proliferating in academia across the countries in recent times. As the medium of vocabulary learning is one of the key factors influencing learners' strategy choices, the current study was conducted to understand the VLS employed by the learners in an electronically driven online learning medium, referring to them as e-Vocabulary learning strategies (e-VLS).

The interdisciplinary study was an attempt to integrate some of the contemporary ICT-facilitated online learning tools into the established field of SLA and study what learning strategies they would facilitate. To add further, it emphasized raising learners' awareness of the use of open-source online learning tools and understanding how their integration into ESL learning would influence the choices of e-VLS among Indian ESL learners. The data collection tools used to collect data for the exploratory study included a questionnaire, reflective journals, researcher's field notes and semi-structured interviews. The questionnaire used in the study consisted of 42 vocabulary learning strategy items adapted from Nohert Schmitt's taxonomy (1997). A thorough review of the literature on LLS and VLS was carried out, and adapted Schmitt's inventory as it was more appropriate for the current study. The participants in the study were 36 postgraduate students enrolled on the MSIT program offered at the International Institute of Information Technology Hyderabad (IIITH), a deemed-to-be University in India. All the students enrolled on the course had regular access to individual laptops, uninterrupted broadband connection and smartphones used for daily learning activities. The participants were heterogeneous in their language proficiency levels and

geography as they predominantly hail from different parts of the Telugu states (Telangana and Andhra Pradesh) and other Indian states. They were from two genders and of the age group 21-25 years.

The two primary objectives of the current study were to explore the e-VLS used by learners and their frequency while using online learning tools. The third objective was to investigate the differences in strategy choices among high and low-proficiency learners. The final objective of the study was to understand the learners' perceptions of learning vocabulary in the online medium and using online learning tools. Four research questions were formulated for the four objectives of the study respectively.

The learners were familiarized with the 42 VLS adapted at the beginning of the study. They were given a list of the strategies for their reference, encouraging them to employ their chosen strategies while learning vocabulary using online tools. Then the participants were oriented on three online tools, 'Yourdictionary', 'Visuwords' and 'Quizlet', with the potential to facilitate different e-VLS and help in better vocabulary learning. Once they got familiar with the strategies and the online tools, they were given the vocabulary tasks designed which could necessitate using different e-VLS of learners' choice while doing them. Every time they did a task, they were made to reflect on the e-VLS they used while doing the tasks and share their experiences of learning using the online medium for the seven tasks which they did one each week.

The study employed both quantitative and qualitative analysis to analyse the data. Descriptive analysis of the data elicited from the pre- and post-intervention questionnaires gave an understanding of the e-VLS used to answer the first three research questions. Thematic analysis of the qualitative data helped in answering the fourth research question.

The results of the e-VLS drawn from the quantitative analysis were triangulated with the qualitative data.

The study generated significant findings on e-VLS used by the learners and learners' perceptions. They include that the learners used a variety of strategies with a significant rise in the number of e-VLS they used compared to the number of VLS they had used earlier. The most used e-VLS were high in number and with higher frequencies compared to the most used strategies found in the field earlier. While the high and low-proficiency learners differed in their most used e-VLS, they resembled in their least used e-VLS. The learners perceived to have learnt peripheral as well as deeper word knowledge ranging from phonological and orthographical forms, word meanings to morphological properties, syntactic properties, word use with appropriate collocations, homonymy and polysemy. They also perceived the online tools as platforms motivating to draw word knowledge in a gradation, flexibly over a day and to learn also beyond classroom.

The findings extend the understanding of VLS in the field to a new vocabulary learning medium, the underexplored online learning medium. They imply that the teachers may encourage the learners to integrate ICT-enhanced online tools with vocabulary learning, in and out of the classroom. They also suggest that the learners could turn autonomous by exercising a variety of e-VLS of their choice, exploring the immense potential of online learning tools.

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To my late father

and

all the language learners facing the digital divide

TABLE OF CONTENTS

Abstract.....	iv
Acknowledgements.....	vii
Table of Contents.....	xi
List of Tables	xx
List of Charts.....	xxi
List of Figures.....	xxi
Chapter 1 Introduction.....	1
1.1 Background to the study.....	1
1.2 Positioning the study.....	4
1.3 Necessity for integration of ICT tools with vocabulary learning.....	5
1.4 Purpose and scope of the study.....	7
1.5 Justification for the study.....	8
1.6 Research Questions.....	10
1.7 Significance and Contribution of the study.....	11
1.8 Chapter scheme of the study.....	12
Chapter 2 Review of Literature.....	13
2.1 Overview of the chapter.....	13
2.2 Language learning strategies.....	13
2.3 Taxonomies of Second language learning strategies.....	16
2.3.1 Rubin's (1981) taxonomy.....	16
2.3.2 LLS Taxonomy of O'Malley and Chamot (1990)	17
2.3.3 Oxford's (1990) taxonomy.....	17

2.3.3.1	Direct Strategies.....	18
2.3.3.2	Indirect strategies.....	19
2.4	Significance of Vocabulary learning and the processes involved in it.....	22
2.4.1	Significance of Vocabulary learning in SLA domain.....	22
2.4.2	Dimensions of Vocabulary knowledge.....	23
2.4.2.1	Breadth of vocabulary knowledge.....	23
2.4.2.2	Depth of vocabulary knowledge.....	24
2.4.2.2.1	Qian's (1999) framework.....	25
2.4.3	Need for an extensive vocabulary learning.....	26
2.5	Literature on Vocabulary Learning Strategies.....	27
2.5.1	Ahmed's (1989) Study on VLS.....	28
2.5.2	Stoffer's (1995) studies on VLS.....	30
2.5.3	Study of Gu and Johnson (1996) on VLS.....	31
2.5.4	Norbert Schmitt's (1997) taxonomy of VLS.....	32
2.5.5	Literature on ICT enhanced vocabulary learning.....	35
2.6	Theoretical foundations of the study.....	36
2.6.1	VLS inventory of Norbert Schmitt (1997) adapted for the study.....	36
2.6.1.1.	VLS for the Discovery of a New Word's knowledge.....	38
2.6.1.2.	VLS for consolidation of a familiar word's knowledge.....	40
2.6.2	Cognitive and Socio cognitive perspectives.....	46

2.6.3	Perspectives of Connectionism.....	47
2.6.4	Three memory models relevant to the use of VLS	49
2.6.4.1	Depth of Processing Theory.....	49
2.6.4.2	Ebbinghaus's (1913) forgetting curve model.....	50
2.6.4.3	Scott Thornbury's (2002) vocabulary learning model.....	50
2.7	Summary of the chapter.....	51
Chapter 3	Methodology.....	52
3.0	Overview of the chapter.....	52
3.1	Participants.....	52
3.2	Research tools.....	54
3.2.1	Questionnaire.....	54
3.2.2	Learners' guided reflective journal.....	55
3.2.3	Researcher's field notes.....	55
3.2.4	Semi-structured participants' interviews.....	56
3.3	Research design.....	56
3.4	Online learning tools used in the study.....	57
3.4.1	Yourdictionary.....	58
3.4.2	Visuwords.....	60
3.4.3	Quizlet.....	62
3.5	Procedure followed for the study.....	64
3.6	Data sources for analysis.....	71
3.7	Summary of the chapter.....	72

Chapter 4	Results.....	73
4.1	Research question 1.....	73
4.2	Research Question 2.....	85
4.2.1.	The most frequently used e-VLS.....	86
4.2.2	The less frequently used e-VLS.....	88
4.2.3	The least frequently used e-VLS.....	88
4.2.4	Analysis of the number of strategies used under each category.....	89
4.3	Research question 3.....	92
4.3.1	Analysis 1.....	94
4.3.2	Analysis 2.....	95
4.3.3	Analysis 3.....	97
4.3.4	Analysis 4.....	97
4.4	Research question 4.....	98
4.4.1	Thematic analysis software tool used.....	99
4.4.2	Section I: Themes of perceptions on Vocabulary learning.....	102
4.4.2.1	Themes of perceptions on what was learnt in the words	102
4.4.2.1.1	Theme 1: Learnt Word forms and Word classes.....	102
4.4.2.1.1.1	Learnt Orthographical and Phonological forms.....	102
4.4.2.1.1.2	Word classes (Parts of speech)	105

4.4.2.1.2	Theme 2: Learnt Meaning, Synonyms and Antonyms.....	108
4.4.2.1.2.1	Learnt meaning directly from the tools.....	108
4.4.2.1.2.2	Learnt meaning by guessing/paraphrasing.....	109
4.4.2.1.2.3	Learnt Synonyms and Antonyms.....	110
4.4.2.1.3	Theme 3: Learnt word families and collocations.....	111
4.4.2.1.3.1	Learnt Word families.....	111
4.4.2.1.3.2	Learnt collocations.....	112
4.4.2.1.4	Theme 4: Learnt Homonymy and Polysemy.....	115
4.4.2.1.4.1	Learnt unrelated meanings for a common word (Homonymy).....	115
4.4.2.1.4.2	Learnt multiple meanings for a common word (Polysemy).....	116
4.4.2.2	Themes of perceptions on how they learnt the words.....	118
4.4.2.2.1	Theme 5: Learnt by making deeper cognitive decisions.....	120
4.4.2.2.2	Theme 6: Learnt by network building.....	122
4.4.2.2.2.1	Built associations among familiar and unfamiliar words.....	122
4.4.2.2.2.2	Strengthened partially familiar and ambiguous words in mental lexicon.....	123

4.4.2.2.3	Theme 7: Learnt through exposure to ‘Word use’ and by using.....	124
4.4.2.2.3.1	Learnt through exposure to ‘Word use’	125
4.4.2.2.3.2	Learnt word use by using	126
4.4.2.2.4	Theme 8: Learnt through ‘Repetition’ and ‘Retrieval’	127
4.4.2.2.4.1	Learnt by practicing ‘Repetition’ and ‘Reinforcement’	127
4.4.2.2.4.2	Learnt through ‘Retrieval’	128
4.4.2.2.5	Theme 9: Learnt through ‘Spacing’ and ‘Pacing’	129
4.4.2.2.5.1	Learnt through ‘Spacing’	129
4.4.2.2.5.2	Learnt through Pacing	130
4.4.2.2.6	Theme 10: Learnt through ‘Imaging’	131

4.4.3	Section II: Themes of perceptions on the use of online learning tools.....	133
4.4.3.1	Theme 11: Motivating interfaces.....	133
4.4.3.1.1	Eager to learn on tools.....	133
4.4.3.1.2	Helpful visual interfaces.....	136
4.4.3.2	Theme 12: Autonomous learning approach.....	138
4.4.3.2.1	Shift in learning style.....	138

4.4.3.2.2	Differed from the classroom learning.....	139
4.4.3.2.3	Need a mentor than a teacher.....	141
4.4.3.3	Theme 13: Fun filled learning.....	142
4.4.3.3.1	Word games.....	142
4.4.3.3.2	Fun to learn with flashcards.....	143
4.4.3.4	Theme 14: Higher accessibility.....	144
4.4.3.4.1	Plenty of material at one place.....	144
4.4.3.4.2	Accessible In and out of class.....	146
4.4.3.5	Theme 15: Time-efficient.....	147
4.4.3.5.1	Time consuming to begin.....	147
4.4.3.5.2	Time conserving overtime.....	149
4.4.3.5.3	Quick learning.....	150
4.4.3.6	Theme 16: Cost effective.....	152
4.4.3.6.1	Free/Cheaper.....	152
4.4.3.6.2	One-time investment.....	153
Chapter 5:	Discussion and Conclusion.....	155
5.0	Introduction.....	155
5.1	Summary of the Findings.....	155
5.2	Findings for the research question 1.....	156

5.3	Findings for research question 2.....	156
5.4	Interpretation and discussion of the findings for research questions 1 and 2.....	157
5.4.1	Interpretation and discussion of the finding 1.....	158
5.4.2	Interpretation and discussion of the finding 2.....	160
5.4.3	Interpretation and discussion of the finding 3.....	163
5.4.4	Interpretation and discussion of the finding 4.....	166
5.4.5	Interpretation and discussion of the finding 5.....	167
5.4.6	Interpretation and discussion of the finding 6.....	171
5.4.7	Interpretation and discussion of the finding 7.....	172
5.4.8	Interpretation and discussion of the finding 8.....	173
5.5	Findings for the research question 3.....	175
5.6.	Interpretation and Discussion of RQ3 findings.....	176
5.6.1.	Interpretation and discussion of the finding 1.....	176
5.6.2.	Interpretation and discussion of the finding 2.....	178
5.6.3.	Interpretation and discussion of the finding 3.....	180
5.6.4.	Interpretation and discussion of the finding 4.....	182
5.6.4.1	Sub discussion 1.....	182
5.6.4.2	Sub discussion 2.....	183
5.6.4.3	Sub discussion 3.....	183
5.6.4.4	Sub discussion 4.....	184
5.6.4.5	Sub discussion 5.....	184

5.6.4.6	Sub discussion 6.....	185
5.7	Findings of the research question 4.....	186
5.7.1	Interpretation and Discussion of the findings of RQ 4.....	187
5.7.1.1	Interpretation and discussion of the finding 1.....	187
5.7.1.2	Interpretation and discussion of the finding 2.....	193
5.7.1.3	Interpretation and discussion of the finding 3.....	194
5.8	Implications of the Study.....	195
5.8.1	Implications of the study for the teachers.....	195
5.8.2	Implications of the study for the learners.....	198
5.9	Scope for further research.....	200
5.10	Conclusion.....	201
	Bibliography.....	203
	Appendixes.....	216
	Appendix I: Questionnaire used for the study.....	216
	Appendix II: Reflective Journal.....	221
	Appendix III: Samples of researcher's field notes.....	224
	Appendix IV: Questions of semi-structured interview.....	231
	Appendix V: Tasks used for the study.....	234
	Appendix VI: Pre-intervention and Post-intervention questionnaires analysis.....	251
	Appendix VII: Sample excerpts of learner reflections and responses used for qualitative analysis using QDA Miner Lite software tool.....	253
	Details of the Paper Publication.....	263
	Details of the papers presented at conferences.....	276
	Library Plagiarish report.....	279

List of Tables

1) Table 1	Definitions of LLS.....	15
2) Table 2	Rubin's (1981) LLS taxonomy.....	16
3) Table 3	O'Malley and Chamot's (1990) LLS model.....	17
4) Table 4	Direct strategies in Oxford's Taxonomy (1990).....	19
5) Table 5	Indirect strategies in Oxford's Taxonomy (1990).....	21
6) Table 6.	Ahmed's (1989) taxonomy of Macro and Micro strategies.....	29
7) Table 7.	Stoffer's (1995) taxonomy of VLS	31
8) Table 8.	VLS Taxonomy of Gu and Johnson (1996)	32
9) Table 9.	Nobert Schmitt's (1997) taxonomy of VSL.....	33
10) Table 10	Discovery-Determination strategies.....	39
11) Table 11	Discovery-Social strategies.....	40
12) Table 12	Consolidation-Social strategies.....	41
13) Table 13	Consolidation-Memory strategies.....	42
14) Table 14	Consolidation-Cognitive strategies.....	43
15) Table 15	Consolidation-Metacognitive strategies.....	44
16) Table 4.1	Analysis of the Pre and Post intervention responses on e-VLS use.....	75
17) Table 4.2	Vocabulary learning strategies' use before intervention.....	79
18) Table 4.3	Post intervention e-Vocabulary learning strategies use.....	81
19) Table 4.4	Frequencies of the e-VLS used.....	87
20) Table 4.5	Details of the categories of e-VLS with their frequency of use.....	90
21) Table 4.6	Details of the categories of the e-VLS and their frequency.....	91
22) Table 4.7	Use of e-VLS by the "A" and "I" group participants.....	96

List of Charts

- 1) Chart 4.1 Rise in the strategies use after the intervention with online learning tools.....83
- 2) Chart 4.2 Difference in the pre and post intervention use of the strategies.....84

List of Figures

- 1) Figure. 3.1. A web page from “Your dictionary” displaying a sample target word “accumulate”59
- 2) Figure 3.2. The sample lexical network for the word ‘Limpidity’ on the web page of ‘Visuwords’61
- 3) Figure. 3.3. A flashcard built for the word “Stout” on Quizlet.....63
- 4) Figure 4.0 Thematic analysis software tool (QDA Miner Lite)..... 100
- 5) Figure 4.1 Themes of perceptions on what was learnt in the words.....104
- 6) Figure 4.2 Themes of perceptions on how learners learnt the words.....119
- 7) Figure 4.3 Themes of perceptions on the use of online learning tools.....134
- 8) Figure 5.1 Percentage of the participants who used the strategy # 36.....168
- 9) Figure 5.2 Percentage of the participants who used the strategy # 2.....169
- 10) Figure 5.3 Percentage of the participants who used the strategy # 1.....170

Chapter 1 Introduction

1.1 Background to the study

For words being the building units of a language, mastering vocabulary becomes a primary prerequisite to learning any language. The significance of vocabulary could be realized with the fact that something could be conveyed without knowing grammar; in contrast, nothing could be conveyed without knowing vocabulary in verbal communication (Wilkins, 1972). Adding to its significance, though language learning involves learning various aspects such as receptive and productive skills, syntax, semantics, pragmatics and culture-specific ideas of a language, the utmost aspect of language learning turns out to be its vocabulary (Folse, 2004).

The research carried out so far in the language studies domain identified vocabulary as the core component of language proficiency (Nation, 2001; Richards et al., 2002). Specifically in the ESL/EFL field, it is believed that learning a target language is not devoid of learning its vocabulary, and attaining proficiency in a second or foreign language crucially depends on the extensive vocabulary store (Ellis, 1995; Nation, 2001; Schmitt, 2008). It is well reported in the studies conducted to determine the percentage of lexical items required by the learners to understand the spoken or written discourses in ESL/EFL contexts. Earlier research found that 95% familiarity with the lexical items in a written text was sufficient to comprehend it by oneself (Laufer, 1989). In contrast, later research reported that 98% familiarity is required to comprehend a text such as a fictional text (Hu and Nation, 2000). To ensure the required 98% coverage of the lexical items, a reader would need to know 8,000 to 9,000 word families, including root forms of the words, their inflections, derivations etc., to comprehend authentic texts like dailies, autobiographies and literary texts without any

external assistance. Similarly, 6,000 to 7,000 word families are needed for unassisted spoken discourse comprehension by covering 98% of its lexical items (Nation, 2006).

The prerequisites mentioned above imply a demand for a more extensive set of lexical items to be attained by ESL/EFL learners, which is found to be a challenge without explicit vocabulary learning. Various studies in the field, like that of Laufer (2000), reported that the learners' vocabulary sizes were typically smaller than the requirements mentioned above. It has been a challenge prevailing in L2 classrooms that despite learners spending considerable time years together learning vocabulary, there appears to be a massive gap between what they learn and what they are supposed to learn (Coady, 1997). It is unlikely that learners would develop enough vocabulary just by doing language tasks that emphasize linguistic or communicative skills. Instead, as Schmitt (2008) suggests, "a more proactive, principle approach" as that of using Vocabulary learning strategies (henceforth VLS) has to be taken up for promoting explicit vocabulary learning.

VLS are a subset of Language learning strategies (LLS) which are, in turn, a part of general learning strategies (Nation, 2001). It has been five decades since research into language learning strategies began to emerge (from the 1970s). In the earlier decades of its evolution, many researchers beginning from Rubin (1975), Cohen and Aphek (1980), O'Malley et al. (1985) to Oxford (1990), keenly understood the nuances of complex language learning processes. Accordingly, they explored appropriate and innovative ways of learning useful for the learner community, referring to them as language learning strategies. In the progression, while their focus was on identifying and classifying language learning strategies, many researchers also dealt indirectly with vocabulary learning strategies. Exclusive studies on vocabulary learning emerged noticeably much after Meara (1980) identified vocabulary learning and VLS as the neglected areas of the language learning domain as other areas, such as the instruction of grammatical and communicative elements, were under focus.

It has been a practice to facilitate learners with grammatical or communicative skills-oriented tasks and anticipate them to learn vocabulary in parallel. Through tasks emphasizing linguistic or communicative elements, vocabulary may be partially learnt as a by-product. While it is true that vocabulary would be an integral part of such activities and learners would get familiarized with the words, it is unclear to what extent a learner would learn the words. It is because, through such activities, a learner may get familiarized with the words, but learning words is much more than just getting familiarized with them. By familiarizing oneself with a word in such a process, one may gain peripheral word knowledge, such as identifying its form and contextual meaning, whereas learning a word would also include attaining deeper word knowledge, such as its morphological relationships, semantic relationships, other word collocates etc. Therefore, in addition to aspiring vocabulary to be learnt as a by-product of linguistic or communicative tasks, it is also important to make them learn vocabulary explicitly to attain the larger and deeper vocabulary store mentioned earlier as a prerequisite for textual comprehension. More importantly, enabling the learners to use VLS as they help in explicit vocabulary learning is essential.

In the following decades of Meara (1980) identifying the necessity of research on exclusive vocabulary learning and VLS use; many studies were carried out in the area. Most such studies conducted in ESL/EFL classrooms primarily adapted two approaches: to explore different VLS used by the learners and to carry out VLS intervention to understand their relationship with language achievement. The studies of Purpura (1994), Stoffer (1995) and Lawson and Hogben (1996) explored different ways of learning vocabulary used by the learners and contributed to their respective VLS taxonomies. However, the taxonomies were still influenced by the LLS taxonomies which had been well established by then. Importantly, Oxford's taxonomy (1990), one of the most comprehensive taxonomies to date concerning language learning strategies, had a more significant influence.

As Schmitt (1997) views, Oxford's taxonomy in general is suitable for VLS too but unsatisfactory in certain respects. He pointed out that none of the categories in Oxford's taxonomy explicitly depicts the strategies used by the learners to discover a new word's meaning themselves. Some strategies in her taxonomy look fluid to fit into two or more categories adding to the ambiguity between memory and cognitive strategies. Regarding vocabulary learning, an essential distinction between Discovery and Consolidation strategies suggested by Cook and Mayer (1983) and Nation (1990) was missing in the LLS taxonomies. Therefore, there was a lack of a vocabulary-specific taxonomy of strategies for a long time. Schmitt (1997) proposed a more exclusive, precise and comprehensive one to fill the gap. He based it on Oxford's LLS taxonomy and the vocabulary strategies' distinction suggested by Cook and Mayer (1983) and Nation (1990). The distinction between discovery strategies which are useful to draw peripheral word knowledge on encountering a word for the first time, and the consolidation strategies, which are useful to draw deeper word knowledge after partially knowing a word, is important to be included as learning vocabulary is incremental in nature. Schmitt's taxonomy (1997) has been a widely used vocabulary-specific taxonomy in many recent studies that explored different VLS used by ESL/EFL learners and their role in attaining a good vocabulary store and language proficiency. The theoretical framework used in the current study to understand the strategies used by the learners is adapted from the same taxonomy, which will be elaborated in detail in the following literature review chapter.

1.2 Positioning the study

Some prominent findings of the studies carried out exclusively on vocabulary learning and VLS use include that high proficiency learners were found to use higher number of strategies than the low proficiency ones (Gu & Johnson, 1996; Kojic-Sabo & Lightbown,

1999; Fan, 2003; Barcroft, 2009; Gu, 2010). The high proficiency learners were also found to use the strategies more frequently (Ahmed, 1989; Lawson and Hogben, 1996; Kojic-Sabo and Lightbown, 1999). Many recent studies, including those which were based on Schmitt's taxonomy, found a positive relationship use of VLS holds with vocabulary and language proficiency (Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Barcroft, 2009; Teng, 2015; Wang, 2018). They also focused on finding the effective VLS for the respective learners under study. However, most of the understanding drawn on VLS used so far appears to be from the studies conducted in the conventional ESL/EFL classroom environment, where learners limit themselves to relying on the course books and the teachers as primary sources of learning vocabulary. There were hardly any studies conducted in a contemporary Information and Communication Technology (ICT) enhanced classroom environment.

In the current digital era, technology has been proliferating, gaining remote access and reaching unreached learners, raising the scope to narrow the digital divide. In such a world progressing at a high pace, knowing how to use the tools and resources available online is part of becoming a strategic learner –Dalton and Grisham (2011). In recent times, there have been numerous technology-based platforms available as open sources, which could be accessed by the learners as vocabulary learning resources in addition to utilizing the course books and teachers.

1.3 Necessity for integration of ICT tools with vocabulary learning

More recent research suggests the instructors to encourage their learners to integrate contemporary technology in learning vocabulary in and out of the classroom as it was found to share a positive relationship with attaining vocabulary proficiency learners need to attain (Cole & Vanderplank, 2016; Peters, 2018; De Wilde et al., 2020). Contributing to the move,

the current study attempted to integrate certain online learning tools with the language classroom and to understand what different VLS learners may use in such a learning environment. It is an extension to the understanding available on VLS in the field in a new medium, an electronically or technologically driven online medium. Furthermore, the VLS exercised by the learner to learn vocabulary using such a medium are referred to as e-Vocabulary Learning Strategies (e-VLS) adopting the nomenclature from Dalton and Grisham (2011). Therefore, the study carried out here differs from the earlier studies in its approach of reporting e-VLS used by learners who are assisted by a contemporary medium, broadly referred to as an ICT-enhanced learning medium. The medium is neither attributed to CALL nor MALL anymore as the dichotomy has been blurred in recent times, for learning platforms could function on either a computer or mobile phone interchangeably. Moreover, they don't require just a computer or a mobile phone to operate but much more than that, like network connectivity, built-in interactive interface, learner-friendly graphical design etc., making them difficult to categorize either as CALL or MALL.

As mentioned earlier, most of the studies on VLS in the field were carried out in the conventional ESL/EFL learning environment without the assistance of ICT learning tools. Comparatively, the number of studies carried out to understand the VLS used by learners in an ICT-facilitated learning environment is minimal. No studies in the field appeared to resemble the current study, which studied the whole set of VLS (adopting from a taxonomy) in a learning medium facilitated by multiple online learning tools. However, few studies that integrated individual online platforms with vocabulary learning and studied an isolated strategy or a small set of strategies or some aspects of vocabulary learning were relevant. For instance, a study by Gómez, M.I. and King, G. (2014) explored the effectiveness of "NovaMind" software in practicing the mind-mapping strategy for vocabulary learning. Few studies examined the impact of their respective platforms on the use of a small set of VLS

(ex. Lan, Y.-J. (2013), Liu SH-J et al. (2014) and Ou Yang, F. C. et al. (2015)), vocabulary outcomes (Ex. Hsiao, I. Y. T. et al. (2017) and Chen et al. (2018)), vocabulary retention (ex. Gómez, M.I. and King, G. (2014)) and the learners' perceptions on using such platforms (ex. Tugce et al. (2016)). The studies mentioned have attempted to understand the effectiveness of a selected online platform in vocabulary learning or its impact on using an isolated strategy or selected strategies. Therefore, the current study is one of the first attempts to examine the use of a more extensive VLS set (adapted from Schmitt's taxonomy (1997)) in an ICT-enhanced learning medium.

1.4 Purpose and scope of the study

The current study's primary purpose was to explore the e-VLS used by learners when they learn vocabulary using online learning tools. For this, the learners were familiarized with the whole set of VLS (adapted from Schmitt's taxonomy (1997)) established in the field and were sensitized to some of the online learning tools available, which could be freely used to learn vocabulary practicing the VLS of their choice. In addition to exploring the VLS used by the learners in the online learning medium, realizing them as e-VLS, there were also three other objectives for conducting the study. The second objective of the study was to understand the frequency of the e-VLS used by the learners. The study's third objective was to investigate the differences in strategy choices among high and low-proficiency learners. The fourth objective of the study was to understand the learners' perceptions of learning vocabulary online and using online learning tools. The study aspired to generate findings on e-VLS used and the learners' perceptions which could add to the understanding of VLS in the field, inform the learner community on the contemporary vocabulary learning medium and encourage them practice strategies elaborately using the medium.

The study confines itself to familiarizing learners with the VLS adapted (from Nobert Schmitt's taxonomy (1997)) and studying their use in an online learning environment. The online learning tools included in the study were primarily three. However, with the researcher's consent, the learners were left flexible to use similar tools they came across to serve their learning needs while doing the vocabulary learning tasks. The participants were postgraduates, and they were good at online accessing skills. The study's findings could be applicable to learners with at least basic vocabulary proficiency and digital literacy levels. The learners' familiarity with virtual resources and online learning has been increasing in recent years, and the recent pandemic resultant learning environment inevitably intensified it. Therefore, there is a considerable rise in the number of learners used to online learning. Nevertheless, the findings could also be extended to the learners who lack such prerequisites, with prior orientation sessions filling the gap.

1.5 Justification for the study

The motivation for the current study has emerged from the research lacuna prevailing between the learning environments in which VLS have been extensively explored and the contemporary online medium in which they are underexplored. There is a good understanding of VLS in the ESL/EFL field by the exploration in language classrooms. However, it has been challenging to bring them into learners' practice, particularly into Indian ESL learners' practice. Apart from the learners' lack of awareness of VLS as a reason behind the challenge, there are also other prominent reasons caused by the learning environment. Teaching and learning in most Indian English classrooms commence under challenging circumstances (Ravi Sheorey, 1999). Teachers face learners of unusual and

diverse English proficiencies in their classroom, ranging from very low to high proficiency with all possible levels in the continuum, making it difficult for them to address individual learner needs. The compact curriculum engaging the teachers with heavy workloads makes it further challenging to work with the same efficacy with the learners every time. On the flip side, there is a lack of emphasis on inculcating VLS, which could equip the learners to be autonomous at the curricular level. English is taught as a subject, paraphrasing the vocabulary content and orienting the learners towards the annual summative exam rather than imparting it as a language (Ravi Sheorey, 1999), leading to a surface rather than a deeper approach to vocabulary learning. As a result, learners continue to predominantly rely on teachers, practice very few VLS and develop low vocabulary and language proficiency.

The challenges, which may be prevailing also in other geographical learning environments, such as limited resources at hand for the learners, limited class hours to access English teachers and crowded classrooms with reduced individual attention, minimize the scope for exercising VLS and impede learners' vocabulary and language achievement. In recent years, the academic decision-making bodies in various countries have integrated ICT to address such challenges. While ICT integration with language classrooms has been increasing, the studies on online learning tools which have the potential to widen the scope for practicing VLS mitigating the challenges mentioned above appeared to be scanty. Therefore, the current study is carried out by integrating the online learning tools with vocabulary learning to understand what VLS are practiced by the learners in such a learning medium.

The other sources of motivation were the recent initiatives taken up in the Indian academic sphere towards e-learning and the call for pilot studies to extend the approach further. Under the Digital India campaign, e-learning platforms such as SWAYAM, DIKSHA, e-PG Pathshala etc., have been initiated with motives of wide access, quality and

equity in education. Contextually, National Education Policy 2020 (henceforth NEP 2020) recommends pilot studies to be carried out in government organizations and premier educational institutions in the country (NEP 2020, 2020) to understand the benefits and risks of integrating online platforms. As mentioned in section 1.3, one of the objectives of the current study is to report the learners' perceptions of integrating online learning tools and of learning vocabulary in the online medium. Having drawn from the ground-level data sources- the learners' responses and the researcher's field observations, the findings of the study could provide valuable insights adding to the pilot studies' move.

1.6 Research Questions

After familiarizing the learners with the VLS established in the ESL/EFL field and sensitizing them to the use of online learning tools, learners were expected to practice the strategies, elaborately overcoming the prevailing challenges with the help of the tools. As the studies which understood the strategies in such a learning environment appeared to be limited in the field, the current study attempted to explore the strategies used by the learners in the online learning medium identifying them as e-VLS. It also studied learners' perceptions of learning online and using online tools for vocabulary learning. The study was conducted with four research questions, as mentioned below. They were guided by the study objectives mentioned earlier.

1. What are the e-vocabulary learning strategies used by ESL learners for learning vocabulary using online learning tools?
2. What are the most and the least frequently used e-vocabulary learning strategies while learning with online learning tools?
3. What are the differences between high and low proficiency learners in using

e-vocabulary learning strategies while learning with online learning tools?

4. What are the perceptions of the learners on learning vocabulary online and on the use of online tools?

1.7 Significance and Contribution of the study

As mentioned earlier, the study finds its significance in extending the literature available on VLS, which was predominantly drawn from conventional classroom learning, by studying the whole set of VLS adapted from Schmitt's taxonomy (1997) in the contemporary online medium. It reports the e-VLS used by the learners, which could be considered suggesting to the language learners in the current online learning era.

Secondly, the study aspired to fill the gap between the rich literature on VLS and limited practice. The existing research on strategies has been significant in facilitating a broader understanding of VLS and identifying effective VLS for classroom learning. However, the challenge of bringing them to large-scale learners' practice in order to equip them with the essential vocabulary proficiency has been persisting for different reasons mentioned earlier. With the integration of online tools, many of the constraints were found to be mitigated in the current study. Consequently, most of the learners turned autonomous and practiced e-VLS, elaborately evading the barriers to practicing the strategies in conventional learning. They have used almost all the strategies adapted for the study and carried out vocabulary learning with a deeper rather than a surface-level approach.

Thirdly, the study is significant for reporting the ground-level learner perceptions on integrating ICT tools (limiting it to vocabulary learning). It contributes to NEP-2020 recommendations on conducting pilot studies intended to understand the possibilities and benefits of integrating online learning with language education (NEP-2020, 2020).

1.8 Chapter scheme of the study

The study is reported in five chapters. While the first chapter covered the study's introduction and conveyed the research questions, the overview of the remaining four chapters is as follows.

Chapter 2 of the study presents an account of the review of relevant literature carried out for the study about vocabulary learning, VLS and e-VLS. Then the important terms closely relevant to the study are elaborated. The following section details the online tools used in the study. After that, the theoretical framework chosen for the study is described and connected to the study.

Chapter 3 is about the Methodology followed for the study. It gives the details of the research design chosen, the participants of the study, the research tools used, and the procedures followed for the study.

Chapter 4 is the analysis and results of the study. It describes the details of the quantitative and qualitative analysis used to arrive at the findings for the first three questions. Then the findings are presented for each question. The findings of the quantitative analysis are corroborated with the qualitative reflections and responses of the learners. In the next section, the details of the qualitative analysis carried out for the fourth research question using the thematic analysis technique and a thematic analysis tool are given. Then the findings of the fourth research question are presented. The findings are presented under super themes and the themes that emerged over analysis.

Chapter 5 is the Discussion and Conclusion chapter. It discusses the findings of the study with their interpretation concerning the relevant literature and the observations made. Then the pedagogic implications for the field are drawn. Later the limitations of the study and the scope for further research are mentioned. Finally, the chapter concludes the study with the major significance of the study.

Chapter 2 Review of Literature

2.1 Overview of the chapter

This chapter gives an overview of the literature review carried out for the study. As the studies on VLS stem from the studies carried out on LLS, the chapter first gives an account of the literature available on LLS. The section focuses on different strategies identified, defined and classified into taxonomies. The prominent studies on LLS are emphasized and their taxonomies are reviewed in detail. Then the chapter presents the significance of vocabulary in the SLA domain and the complexity involved in learning vocabulary. In the next section, it gives an account of the prominent VLS studies and their respective taxonomies. Then the chapter depicts the supporting theoretical framework used for the study.

2.2 Language learning strategies

The literature on general LLS is the base for that of VLS in the field as the theory and practice of VLS predominantly stems from it. Research into LLS commenced with the pioneering work of Joan Rubin and Stern in the 1970s, much prior to the studies carried out on VLS. It began as a movement from the perspective of using teaching practices to that of how the learner's actions and thoughts could make a difference to language learning. Gradually it started flipping the notion of aptitude as the most governing factor of one's language proficiency to the significance of individual endeavours. Rubin (1975) and Stern (1975) carried out their work to understand the actions of second language learners (the strategies exercised without their explicit notice) which helped them to succeed in language

learning. Having identified some successful strategies among the learners, Rubin (1975) constructed “The good language learner” model. Identifying, defining and classifying the language learning strategies have been the significant practices in the field. The practice of identifying learners’ characteristics, understanding those characteristics as effective strategies has been propagated further by various researchers over time (Ex.: Naiman & Frohlich, 1978; Stern & Todesco, 1996; O’Mally and Chamot, 1990; Oxford, 1990). The practice of defining was carried out by stating strategies in multiple ways by the researchers in the field of language studies. Some of such prominent definitions are as mentioned in Table 1.

As seen in Table 1, though the definitions of LLS were stated using different terms, they broadly reflect certain commonalities among them: They are identified in the form of individual behaviours or actions, thoughts, tactics or techniques employed consciously or unconsciously by the learners while learning a language. The definitions also look similar in conveying the purpose of using the strategies. They also similarly imply that strategies are used to attain common and broader objectives, learner autonomy and enhanced learning. Strategies are defined with a common notion that they can promote learner autonomy by making learning more self-directed, comparatively easier, enjoyable and faster. Learners enhance their learning by using strategies which raise their level of comprehension, for better retention, to recall what is learnt and to apply it meaningfully.

Table 1 Definitions of LLS

S. No.	LLS Definition	Researcher
1	"The techniques or devices which a learner may use to acquire knowledge"	Rubin (1975)
2	"Strategies are general, more or less deliberate approaches, while techniques are more specific, observable forms of language learning behavior"	Stern (1975)
3	"Language learning strategies (LLS) are conscious and observable actions that learners acquire and use to develop their language "	O'Malley & Chamot (1990)
4	"Specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations"	Oxford (1990)
5	"Generally, a strategy is a mental or behavioral activity related to some specific stage in the process of language acquisition or language use"	Ellis (1994)
6	"Processes which are consciously selected by learners and which may result in action taken to enhance the learning or use of a second or foreign language, through the storage, retention, recall, and application of information about that language"	Cohen (1998)
7	"Conscious or unconscious techniques or activities that an individual invokes in language learning, use or testing"	Purpura (1999)

2.3 Taxonomies of Second language learning strategies

As mentioned above, the researchers in the field of LLS commonly focused on identifying, defining and then classifying the strategies. Therefore, after identifying and defining the strategies they classified them by organizing the strategies into appropriate categories and proposed different taxonomies. The taxonomies in the field form the major treasure of LLS literature. Among the prominent ones, the taxonomies of Rubin (1981), O'Malley and Chamot (1990), and Oxford (1990) have been most influential in the field of LLS research being more elaborate and comprehensive. They are presented and described in the following sections as they are also closer to the VLS taxonomies that emerged later.

2.3.1 Rubin's (1981) taxonomy

Rubin's taxonomy brings in a dichotomy by categorizing the second language learning strategies into direct and indirect strategies. The processes that are directly involved in learning were placed under direct strategies and the processes that created opportunities for further practice and production were placed under indirect strategies. Rubin categorized six strategies under the direct strategies and two under the indirect strategies. The details are as represented in table 2.

Table 2 Rubin's (1981) LLS taxonomy

Category	Direct strategies	Indirect strategies
Subcategories	Clarification/ verification Monitoring Memorization Guessing/ inductive reasoning Deductive reasoning practice	Creating practicing opportunities Using production techniques

2.3.2 LLS Taxonomy of O'Malley and Chamot (1990)

O'Mally and Chamot disregard the idea of a dichotomy in classifying the strategies, as they see a need to further elaborate the strategies. They proposed their taxonomy distinguishing the strategies under three broad categories, Cognitive, Metacognitive and Social/Affective strategies as presented in table 3. There were multiple subcategories under each category as seen in the table.

Table 3 O'Malley and Chamot's (1990) LLS model (Adapted from Han, 2014)

Category	Cognitive strategies	Metacognitive strategies	Social/Affective strategies
Subcategories	Grouping Organizing Repetition Inferencing Summarizing Deduction Imagery Elaboration and Information transfer	Advance organizers Selective attention Self-management Planning Self-monitoring and Self-evaluation	Cooperation, Questioning for clarification Self-talk

2.3.3 Oxford's (1990) taxonomy

Oxford's (1990) classification is more concrete and comprehensive compared to the classifications done by Rubin (1981) and O'Mally Chamot (1990). Oxford retains Rubin's dichotomy of direct and indirect strategies and develops it further by making the definitions

of the two categories more concrete and by adding six subcategories under the dichotomy, three under each main category. According to her, the direct strategies are the strategies which involve directly in the language learning process, and the indirect strategies are the ones which do not. Instead, indirect strategies assist the learners indirectly in language learning with additional practice. Under Direct strategies, she added Memory, Cognitive, and Compensation strategies as the subcategories, majorly basing them on the cognitive approach to language learning. Under the indirect strategies, Metacognitive, Affective and Social strategies are included as the subcategories basing them on socio-cognitive and psycholinguistic approaches. Further details of the strategies under each subcategory are presented in table 4.

2.3.3.1 Direct Strategies

Among the direct strategies in the taxonomy, Oxford (1990) defines Memory strategies as the ones used by the learners to associate new knowledge to the old knowledge. They generally do not help in deep learning. She defines the Cognitive strategies as the ones used to manipulate the information learnt and transform it into long-term memory for better retention. Compensation strategies are a new group of strategies that she adds under the direct strategies seeing their necessity for learners struggling to communicate in the target language. As she views, learners use them to overcome the limitations of inadequate competency in the target language by guessing from the context while reading or listening, paraphrasing, using synonyms, switching to mother tongue, shifting to non-verbal communication etc.

Table 4 Direct strategies in Oxford's Taxonomy (1990)

Category	Memory Strategies	Cognitive Strategies	Compensation Strategies
Subcategories	A. Creating mental linkages: 1. Grouping 2. Associating or elaborating 3. Placing new words into a context B. Applying images and sounds: 1. Using imagery 2. Semantic Mapping 3. Using keywords 4. Representing sounds in memory C. Reviewing well: 1. Structured reviewing D. Employing action: 1. Using physical response or sensation 2. Using mechanical techniques	A. Practicing: 1. Repeating 2. Formally practicing with sounds and writing systems 3. Recognizing and using formulas and patterns 4. Recombining 5. Practicing naturalistically B. Receiving and sending messages: 1. Getting the idea quickly 2. Using resources for receiving and sending messages C. Analysing and reasoning: 1. Reasoning deductively 2. Analysing expressions 3. Analysing contrastively (Across languages) 4. Translating 5. Transferring D. Creating structure for input and output: 1. Taking notes 2. Summarizing 3. Highlighting	A. Guessing intelligently: 1. Using linguistic clues 2. Using other clues B. Overcoming limitation in speaking and writing: 1. Switching to the mother tongue 2. Getting help 3. Using mime or gesture 4. Avoiding communication partially or totally 5. Selecting the topic 6. Adjusting or approximating the message 7. Coining words 8. Using a circumlocution or synonym

2.3.3.2 Indirect strategies

As mentioned earlier, three sub categories under indirect strategies were metacognitive strategies, affective strategies and the social strategies. Metacognitive strategies are higher order strategies that comprise reviewing one's own learning, making decisions about planning, monitoring one's own learning and evaluating learning time to time. Affective strategies help in managing one's own learning related emotions, motivation levels and attitudes. Social strategies are used to interact with the co-learners, teachers or any other social individuals to learn language or clarify what they learn. There are different strategies included under each sub category as presented in table 5. With exploratory factor analysis done in later studies, Oxford's taxonomy was found to be more reliable and the most comprehensive taxonomy to date. Consequently, it emerged as the most widely used taxonomy with reference to LLS research.

Though Oxford's taxonomy was elaborate, it was more confined to LLS as described above. However, it gained a greater understanding well before research carried out on VLS and finds VLS research as a subset of it. In other words, it laid a foundation for the theory and practice of VLS. A good number of LLS studies in the process of identifying, defining, and classifying the strategies which help in language learning, interplayed indirectly with many VLS. They specifically focused on some of the VLS considering them to contribute to language proficiency. In addition to such studies, for a long time, there was a need to carry out exclusive studies to identify and classify VLS as they enhance vocabulary proficiency first and thereby language proficiency. Such exclusive studies on VLS emerged almost two decades after Meara (1980) identified vocabulary learning and VLS as the neglected areas of the language learning domain. The significance of vocabulary learning in attaining language

Table 5 Indirect strategies in Oxford's Taxonomy (1990)

Category	Metacognitive Strategies	Affective Strategies	Social Strategies
Subcategories	A. Centering your learning: 1. Overview and linking with already known materials 2. Paying attention 3. Delaying speech production to focus on listening B. Arranging and planning your learning: 1. Finding out about language learning 2. Organizing 3. Setting goals and objectives 4. Identifying the purpose of a language task (Purposeful listening, reading, speaking, or writing) 5. Planning for a language task 6. Seeking practice Opportunities C. Evaluating your learning: 1. Self-monitoring 2. Self-evaluating	A. Lowering your anxiety: 1. Using progressive relaxation, deep breathing, or meditation 2. Using music 3. Using laughter B. Encouraging yourself: 1. Making positive statements 2. Taking risks wisely 3. Rewarding yourself C. Taking your emotional temperature: 1. Listening to your body 2. Using a checklist 3. Writing a language learning diary 4. Discussing your feelings with someone else	A. Asking questions: 1. Asking for clarification or verification 2. Asking for correction B. Cooperating with others: 1. Cooperating with others 2. Cooperating with proficient users of the new language C. Empathizing with others: 1. Developing cultural understanding 2. Becoming aware of others' thoughts and feelings

proficiency and the complex processes involved in vocabulary learning have attracted the researchers' attention. Consequently, research on vocabulary learning and VLS emerged as a recognized field, moving away from LLS research. The move facilitated a more profound understanding of processes involved in vocabulary learning and the necessity of studying VLS exclusively.

2.4 Significance of Vocabulary learning and the processes involved in it

Before reviewing literature on VLS, a review of the significance of vocabulary learning in SLA, dimensions of vocabulary knowledge and processes involved in learning vocabulary is carried out in the following sections.

2.4.1 Significance of Vocabulary learning in SLA domain

Vocabulary learning, a neglected domain of SLA earlier, received focus as it helps attain successful language learning. Bringing vocabulary learning to the forefront might be a result of the views that learning a target language is not devoid of learning its vocabulary and attaining mastery in a second language crucially depends on the extensive vocabulary store (Ellis, 1994; Nation, 2001; Schmitt, 2008). The four skills of language, reading, listening, speaking and writing were theoretically well established much earlier in the SLA domain and the significance of vocabulary was traced later. However, research on Vocabulary learning received its momentum integrating all the four skills in a short time. Until then, despite adopting various methods in L2 classrooms with a strong theoretical base, there were challenges the learners faced in attaining language proficiency.

This may be because of the fact that vocabulary is a core component of language proficiency and provides much of the basis for how well learners read, listen, speak and write (Richards et al., 2002) but it lacked the emphasis in the

methods adopted for L2 proficiency over a long time. The disregarded role of vocabulary in L2 proficiency would have also added to the notion of ineffectiveness of different methods adopted in the field of SLA. Along with it, the mistreatment in exploring vocabulary learning would have consequently led to a shift from one method to another in the evolution of methods ultimately leading to the era of post method (Kumaravadivelu, 2006; Brown, 2000).

2.4.2 Dimensions of Vocabulary knowledge

The studies carried out on vocabulary learning have identified two dimensions of vocabulary knowledge, breadth of vocabulary knowledge (Ex. Read, 2000) and depth of vocabulary knowledge (Ex. Nation, 2001). While breadth of vocabulary knowledge is defined as the number of words a learner may know at a given proficiency level, the depth of vocabulary knowledge is understood by how well a learner knows the familiar words (Nation, 2001). They both constitute vocabulary proficiency.

2.4.2.1 Breadth of vocabulary knowledge

As Nation (2001) views, vocabulary knowledge is understood by the quantity of vocabulary a learner is familiar with at a given proficiency level. In other words, as Qian (2002) specifies, it is the number of words for which a learner at least knows the peripheral word knowledge such as meaning. The breadth of vocabulary knowledge is necessary for language proficiency as it is crucial in comprehension of a spoken or written discourse. The studies that were conducted to explore the percentage of lexical items learners require to understand a spoken or written discourse in ESL/EFL

contexts reported on the significance of the vocabulary store. Earlier studies reported that 95% coverage (familiarity with the lexical items) was sufficient to comprehend a written text by oneself (Laufer, 1989). However, later research found that 98% coverage is needed to comprehend a text like fictional text (Hu and Nation, 2000). To ensure the required 98% coverage without any one's assistance, a reader is expected to know 8,000 to 9,000 word-families, which include the root words, inflections, derivations etc., to comprehend any authentic text as that of newspapers, autobiographies and novels. Similarly, to ensure the required 98% coverage in a spoken discourse, 6,000 to 7,000 word-families are supposed to be known for unassisted comprehension of the discourse (Nation, 2006).

Language proficiency attained by vocabulary breadth is usually measured by tests that include word synonyms, word meanings, matching exercises and L1 translations. Nation's (1983, 1990) test on vocabulary levels is a prominently used one to measure breadth of vocabulary knowledge. Its testing range varies from words of high frequency (2000-word level) to that of low frequency (10,000-word level). Different researchers in the field used the test in their studies and found a positive correlation between Vocabulary size and language proficiency (Ex. Laufer, 1992; Qian, 1999, 2002).

2.4.2.2 Depth of vocabulary knowledge

Depth of vocabulary knowledge implies how well or to what extent a learner knows a word (Nation, 2001). The extent to which one has to master a word to use it appropriately is well described by Nation (2001). He argues, knowing a word is not just knowing its form such as word parts, orthographic and phonological forms but

also knowing its meaning realized as reference, concept and word associations, and using the word with its right grammatical functions and collocations by being cautious of the constraints on word use. Based on Nation's (1990) views on depth of vocabulary knowledge, Qian (1999) built an elaborate and comprehensive framework specifying six aspects (Wang, 2018) which constitute depth of word knowledge as follows.

2.4.2.2.1 Qian's (1999) framework on depth of word knowledge

- 1. Pronunciation and spelling:** Knowing different forms of the word and how to pronounce and spell them.
- 2. Morphological properties:** Knowing the root word and its inflections, possible derivations, word formation devices and different parts of speech.
- 3. Syntactic properties:** Knowing appropriate positions of the word, syntagmatic relationships of the words, including collocations at a sentence level.
- 4. Meaning:** Not just knowing the denotative meaning but also the possible connotations of the word, its synonyms and antonyms, homonymy, polysemy and the paradigmatic relationships of the word at a textual level.
- 5. Register or Discourse features:** Knowing stylistic, regional and social discourse features of vocabulary, identifying the field, tenor and mode in reference to application of vocabulary in discourse.
- 6. Frequency of the word:** Knowing if a word is frequently used or rarely used in field specific texts.

Therefore, learning a lexical item is not just familiarizing with its primary knowledge such as form (pronunciation and spelling) and meaning but also entailing learning its morphological features, stylistic application, register, syntactic

relationships such as collocations and semantic relationships such as synonyms, antonyms and homonyms. In other words, to attain vocabulary proficiency a learner needs to know both syntagmatic and paradigmatic relationships words share in a discourse (Qian, 1999).

2.4.3 Need for an extensive vocabulary learning

As mentioned above, the breadth and depth of vocabulary knowledge imply that an extensive set of lexical items and deeper understanding of these items needs to be attained by ESL/EFL learners for vocabulary proficiency. However, attaining a larger set of words along with deeper understanding was found to be a challenge without explicit vocabulary learning. Studies such as the one carried out by Laufer (2000), reported that vocabulary sizes of the learners were typically lesser than what were required for better comprehension of written and spoken discourses. In L2 classrooms, it has been a challenge that despite learners spending considerable time, years together learning vocabulary, there appeared a massive gap between what they learnt and what they were supposed to learn (Coady, 1997). Even today, vocabulary learning is a major challenge as it is a complex cognitive process that seems to be linear at the beginning (Cook, 2001) but turns out to be a complex one while learning due to the breadth and depth of vocabulary knowledge mentioned. It is unlikely that learners could develop the required vocabulary proficiency just by doing language tasks that emphasize more on linguistic or communicative skills. As Schmitt (2008) suggested, “a more proactive, principle approach” such as using VLS has to be taken up for promoting explicit vocabulary learning. One way of implementing this approach could be by incorporating VLS while doing the vocabulary focused

activities. By using VLS, learners could not only acquire a larger vocabulary store but could even develop deeper vocabulary knowledge establishing the syntagmatic and paradigmatic relationships among words (Schmitt, 2008). While it may require a long time and great effort, learning vocabulary, with focus on all its dimensions, is essential to attain the required proficiency. In the contemporary technology driven world, practicing VLS by using the online vocabulary learning tools, learners may significantly reduce the time and effort required otherwise for vocabulary building.

2.5 Literature on Vocabulary Learning Strategies

Given the multiple dimensions of vocabulary knowledge and complex processes, it is believed that it is better to teach VLS to the learners to enable them deal with the word knowledge rather than teaching them words (Nation, 1990). It is believed that VLS would help learners in the processes of knowing, processing, storing, retrieving and applying word knowledge. Complying with the view, VLS have increasingly drawn researchers' attention as an additional approach to vocabulary learning with a shift in focus from teaching-centeredness to learning-centeredness and learner autonomy (Carter, 1998). Most of the studies on LLS commonly reported that strategies used for vocabulary learning are the most used strategies than the ones used for learning any other language element such as reading comprehension, listening comprehension, communication, oral presentations etc. Chamot (1987). Studies on LLS also stressed on memory and cognitive strategies which are closely associated with vocabulary learning. Such studies imply that strategies that were good for vocabulary learning and retention were perceived to benefit language learning as well. More detailed understanding on strategies for vocabulary learning was drawn when research on VLS emerged as a separate field from the field of LLS research. Research on VLS is

relatively a new area of research in SLA which attracted the attention of the researchers in the 1990s with an increased appreciation for vocabulary learning (Liu, 2013).

Similar to the LLS research, studies on VLS also focused on identifying, naming and classifying strategies. They majorly employed techniques of using questionnaires, interviews and classroom observations to explore VLS and classify them into taxonomies. Among several studies on VLS, synthesis of major studies of Ahmed (1989), Stoffer (1995), Gu and Johnson (1996) and Schmitt (1997) which are relevant to the current study are provided in the following sections.

2.5.1 Ahmed's (1989) Study on VLS

Ahmed's (1989) study was one of the first attempts to identify VLS used by 300 Sudanese English language learners. He categorized the strategies into Macro and Micro strategies. While macro-strategies refer to more general approaches to learning vocabulary, micro-strategies refer to specific and detailed behavioural strategies. He identified 38 micro strategies classifying them into 6 macro-strategies based on the good language learner model. The details of the strategies are as presented in table 6.

While the earlier studies on LLS focused more on strategies used by high proficiency learners, Ahmed focused on both high and low proficiency learners in his study referring them as successful and unsuccessful learners. He discovered the differences between the two learner groups in using VLS. He found that high proficiency learners used multiple strategies, had clarity on what to learn about new words, knew the importance of contextual word learning, were aware of the semantic relationships among the old and new words, and made best use of the monolingual and bilingual dictionaries. In contrast, the low proficiency learners employed few

strategies, showed little interest in contextual word learning, and were unaware of the semantic relationships between the old and new words.

Table 6. Ahmed's (1989) taxonomy of Macro and Micro strategies

Macro-strategies	Information sources	Dictionary use	Memorization	Practice	Preferred source of information	Note-taking
Micro-strategies	Asking classmates	Monolingual dictionary	Write and repeat aloud	New word in real situation	Asking somebody	take notes at all
	Guessing	Bilingual dictionary	Repeat aloud	New word in imaginary situation	Group work	Notes in margin
	Asking teacher	Look up meaning	Write, repeat and L2 synonym		Dictionary	Vocabulary book
	Overlooking	Look up derivation	Write, repeat and L1 equivalent	Ask for test		Ordering new words in sequence
	Asking for L2 paraphrases	Look up word class		Ask others to verify knowledge		Organizing words by meaning
	Asking for L1 equivalent	Look for example of use		Use written source to verify knowledge		Spelling info
	Asking for example of use			Self-test		L1 equivalent
	Group work					L2 synonym
	Dictionary					Word derivations
						Grammatical info

2.5.2 Stoffer's (1995) studies on VLS

Stoffer carried out a series of studies to understand different VLS used by the learners and their frequency of use. One among them was a large-scale study conducted on 707 students from University of Alabama. She developed an inventory of 53 items, Vocabulary Learning Strategies Inventory (VOLSI) by herself for her studies. She used authentic learner data and employed statistical procedures to confine the strategy categories. Using the exploratory factor analysis, she proposed a taxonomy of nine different categories as presented in table 7. Some of the strategies in the taxonomy such as using computer programs and using flashcards were closely related to the current study. The study found that the most used strategy category was “Strategies used to create mental linkages” and the least used category was “Strategies involving creative activities”. It also found that the high proficiency learners used the strategies more frequently than the low proficiency learners.

Ahmed (1989) and Stoffer (1995) primarily focused on identifying the strategies rather than classifying them. Ahmed's categorization of macro and micro-strategies was rather generic as there were no references to established categories in the field of SLA such as cognitive, metacognitive and socio-affective strategies. Stoffer's (1995) taxonomy had reference to memory strategies but explicit references to other categories were not seen. Having drawn a substantial understanding on VLS through their studies, researchers in the subsequent years have focused more on systematically classifying the strategies into different categorizations.

Table 7. Stoffer's (1995) taxonomy of VLS (adapted from Han, 2014):

VLS Category	Example strategy
Strategies involving authentic language use	Reading newspapers and magazines
Strategies involving creative activities	Use computer programs to practice words Record words on tape and listen
Strategies used for self-motivation	Relaxing when afraid of using a word Quiz oneself or let others quiz the learner
Strategies used to create mental linkages	Linking word to similar sounding L1 word Use associations like synonyms/opposites
Memory strategies	Using flashcards Repeating a new word aloud several times
Visual/auditory strategies	Arranging words on page to form patterns Listen to the pronunciation from others
Strategies involving physical action	Using pantomime and gestures to practice Physically acting out new words
Strategies used to overcome anxiety	Noticing when tensed or nervous Trying to relax when afraid of using word
Strategies used to organize words	Grouping words by grammatical classes Grouping new words by topic

2.5.3 Study of Gu and Johnson (1996) on VLS

Gu and Johnson (1996) conducted another large-scale study in Mainland China. They investigated Chinese learners' use of English vocabulary learning strategies at Beijing Normal University by administering a Vocabulary Learning Questionnaire (VLQ Version 3) developed for the purpose. They classified VLS into two major categories, Meta-cognitive strategies and Cognitive strategies. Further details of the subcategories in the taxonomy are presented in table 8 and the following section.

Table 8. VLS Taxonomy of Gu and Johnson (1996)

Major categories of VLS	Metacognitive Strategies	Cognitive Strategies
Subcategories of VLS	Selective attention Self-initiation	Guessing strategies Dictionary strategies Note-taking strategies Memory strategies for rehearsal Memory strategies for encoding Activation strategies

There were 91 VLS categorized under 8 subcategories in the taxonomy as seen in table 8. The researchers based the strategies and their categorization on the learners' beliefs on vocabulary learning and the use of strategies. It is worth noting that the participants in this study did not use much rote memorization, and they reported using more meaning-oriented strategies such as contextual guessing, dictionary use and note taking, than rote memorization strategies. The findings of the study contradict the popular beliefs that Asian students persist in using rote memorization and repetitive strategies (O'Malley et al. 1990).

2.5.4 Norbert Schmitt's (1997) taxonomy of VLS

Norbert Schmitt (1997) conducted another prominent study on VLS used by Japanese English learners and proposed a taxonomy. He based his taxonomy on Oxford's (1990) categorization of LLS. However, he combined the two-fold direct and indirect strategies present in Oxford's model and incorporated another dichotomy of Discovery and Consolidation strategies suggested by Cook and Mayer (1983) and Nation (1990). They suggested the necessity of the dichotomy between discovery

strategies, which are useful in drawing primary and peripheral word knowledge of a new word and the consolidation strategies, which are useful in drawing additional and deeper word knowledge of a familiar word and to retain it in memory. Pointing that such essential distinction in vocabulary learning was missing in Oxford's (1990) taxonomy of LLS, he incorporated the dichotomy in his VLS taxonomy as presented in table 9. The table also shows the subcategories with their respective example strategies.

Table 9. Nobert Schmitt's (1997) taxonomy of VSL

Major Category	Subcategories	Example VLS
Discovery strategies	Determination strategies	Analyse part of speech Bilingual dictionary use
	Social strategies	Ask teacher for synonym Ask classmates for meaning
Consolidation strategies	Social strategies	Study and practice meaning in a group Interacting with native speakers
	Memory strategies	Grouping words together to study Saying new word aloud when studying
	Cognitive strategies	Verbal repetition Taking notes
	Metacognitive strategies	Testing oneself with word tests Continue to study word over time

As seen in table 9, the two-dimensional taxonomy had six subcategories (with social strategies mentioned twice). The social strategies were included by differentiating the ones used for discovering the word knowledge from the ones used for consolidating the word knowledge. Excluding the duplicacy, there were five different types of subcategories in Schmitt's taxonomy. He adapted four of Oxford's six strategy types, social, memory,

cognitive and metacognitive strategies and placed them as four subcategories under the two dimensions, discovery and consolidation strategies.

While social strategies were viewed as the strategies learners use to interact with others to improve their language, the memory strategies were defined as the ones which help in relating the new information to the existing word knowledge. The third type of strategies in the taxonomy, cognitive strategies, were viewed as the strategies of information manipulation and transformation to long term memory (Oxford, 1990). The fourth type of strategies, metacognitive strategies, were defined as the strategies useful in drawing a broader overview on learning. They help in planning, reviewing and evaluating one's own learning and making decisions accordingly.

Schmitt also pointed out that none of the strategy types of the Oxford's (1990) taxonomy explicitly indicate the strategies used by a learner to discover a new word's meaning by oneself without the assistance of others. Filling this gap, he added a novel category of 'Determination strategies' in the taxonomy in addition to the four strategy types adapted.

From his study, Schmitt found the most frequently used discovery strategies to be the use of bilingual dictionaries, guessing meaning from context and seeking help from peers. Whereas the most used consolidation strategies were verbal repetition, written repetition and studying the word spelling. The least used strategies were using physical action, L1 cognates, and the use of semantic mapping strategy. Further details such as the strategies under each subcategory and the rationale for adapting the taxonomy for the current study are mentioned in the theoretical foundation section.

2.5.5 Literature on ICT enhanced vocabulary learning

In the literature review carried out, there appeared no studies in the field resembling the current study which have studied the whole set of VLS (adopting them from a taxonomy) in an ICT enhanced learning medium. However, there were few relevant studies, presented in the section below, which examined the integration of individual online platforms with vocabulary learning and their impact on the use of selected VLS, vocabulary output, vocabulary retention and the learners' perceptions on using such platforms.

A study conducted by Lan, Y.-J. (2013) on Taiwanese learners evaluated the effects of a co-sharing learning system, "Mywordtools", on the use of some of the VLS and on learning the words provided on it. It was found that the learners who accessed the platform utilized the e-resources available on it, actively exercised twelve VLS suggested and outperformed the ones who did not use the platform. In another study conducted by Ou Yang, F. C. et al. (2015), they explored the effectiveness of another e-learning platform, MyEVA and found that it resulted in a better vocabulary learning and retention among the learners.

Hsu, C.-K. et al. (2013) in a study found that video captions used as a supplement to the input led to better vocabulary acquisition among the learners. Gómez, M.I. and King, G. (2014) studied the use of mind mapping strategy for vocabulary learning on a mind mapping software, NovaMind software. It was found that learners memorized the vocabulary better and retained it longer as the pictorial diagrams formed through mind mapping were easier to design using the software and

the diagrams formed were similar to the associations brain makes among the words and images.

Tugce et al. (2016) encouraged the learners to use Quizlet, an online tool for vocabulary learning which is also used in the current study, and studied their perceptions on using the tool. It was found that the learners perceived the tool to be more effective in the beginning phase of vocabulary learning than the revision phase. Hsiao, I. Y. T. et al. (2017) in another study on learning vocabulary in authentic contexts found that learning vocabulary in the authentic contexts simulated by augmented reality programs shared a positive relationship with the use of VLS and vocabulary outcomes. Webb (2015) and Lee (2019) through their empirical studies found that use of technology facilitated activities in and out of the classroom share a positive relationship with breadth and depth of vocabulary knowledge.

2.6 Theoretical foundations of the study

Following four are the theoretical foundations for the current study:

- 2.6.1 VLS inventory of Norbert Schmitt (1997) adapted for the study
- 2.6.2 Cognitive and Socio cognitive perspectives
- 2.6.3 Perspectives of Connectionism
- 2.6.4 Three memory models relevant to the use of VLS

2.6.1 VLS inventory of Norbert Schmitt (1997) adapted for the study

Though Oxford's (1990) taxonomy, as reviewed earlier, was much more elaborate and extensively used in the SLA domain, it was more confined to generic language learning

strategies. Nonetheless, out of all the established LLS taxonomies, Norbert Schmitt (2001) viewed Oxford's (1990) taxonomy as the best to capture and organize a wide variety of vocabulary learning strategies identified. The research on LLS integrally includes the research on VLS as a subset of it. However, an exclusive model and inventory of VLS was a lacuna for a long time, which was filled significantly by Schmitt's contribution.

Schmitt (1997) developed an inventory of VLS by incorporating 58 strategies under six subcategories (presented in section 2.4.4). He adapted it from Oxford's (1990) Strategies Inventory for Language Learning (SILL) and used it in his study. His taxonomy was elaborate and comprehensive regarding VLS, as Oxford's (1990) taxonomy did about LLS. It has been the most extensively used inventory by several studies on VLS, including the current study. There are varied reasons for adapting the inventory to the study. As the inventory was elaborate, as mentioned, it was possible to observe specific strategies narrowed down by Schmitt. It included the most apparent VLS practiced by the learners. Then, as the inventory was comprehensive, it was easy for the learners to understand and reflect if they practiced them earlier or during the study. So, it was convenient to take it to an ESL classroom and practicable during the study.

Further, pertaining to the context of the current study, it was suitable for observing each strategy in an ICT-enhanced online learning environment. In other words, it was possible to configure which strategies were facilitated by which learning options were available on the online tools. Then, pertaining to categorizing the strategies under two major categories, Discovery and Consolidation, the dichotomy helped identify the strategies used to draw primary and secondary word knowledge more distinctly while using the online learning tools.

Broadly, the 58 VLS in the inventory were organized under two major categories- Discovery and Consolidation strategies. Specifically, they were under six subcategories, out of which two were under Discovery strategies: Discovery-Determination and Discovery-Social strategies; and four were under Consolidation strategies: Consolidation-Social, Consolidation-Memory, Consolidation-Cognitive and Consolidation-Metacognitive strategies. Among the six subcategories, 'Discovery-Determination strategies' was a new category included by Schmitt as there was no reference to the strategies which help learners discover the meaning of a new word themselves without anyone's assistance in Oxford's taxonomy. Whereas the other subcategories were adapted from her taxonomy. The details of the two major categories, the six subcategories, and the strategies under them are mentioned in the following sections, 2.6.1.1 and 2.6.1.2.

2.6.1.1. VLS for the Discovery of a New Word's knowledge

Schmitt defined the discovery strategies as the strategies used by learners to draw primary word knowledge when they encounter a word for the first time. There were two subcategories under the discovery strategies, determination strategies and social strategies. While the determination strategies were identified as the strategies learners use to discover the meaning of a word themselves without seeking help from others, the social strategies were defined as the strategies learners use to draw primary word knowledge, such as meaning and L1 translation, by interacting with others.

I. Determination strategies

When learners come across a new word in a text, they usually try to discover the meaning of the word using their background knowledge. They may guess it from the context, decode the form using familiar prefixes or suffixes, use cues from any picture provided as a supplement, use reference material such as dictionaries etc.

Some may use flashcards if provided to assist them. All such strategies which assist in drawing the primary word knowledge by oneself without relying on any other's help are referred as determination strategies. The strategies included under this subcategory are presented in table 10.

Table 10 Discovery-Determination strategies

Subcategory	Strategies
Determination Strategies	1) Analyse part of speech 2) Analyse affixes and roots 3) Check for L1 cognate 4) Analyse any available pictures or gestures 5) Guess from textual context 6) Using Bilingual dictionary 7) Using Monolingual dictionary 8) Using Word lists 9) Using Flashcards

II. Social strategies

Another way for learners to discover a new word's meaning could be by exercising social strategies. They include interacting and enquiring about it from those who got better word knowledge. Learners often enquire about it from their teachers or the more successful co-learners. When learners approach them for help, they may ask for an L1 translation, words with similar meaning, a paraphrased meaning, the use of the word in a simple sentence etc. These strategies are categorized under social strategies as they help discover word knowledge through social interactions. The strategies Schmitt placed under this subcategory are presented in table 11. The strategies are numbered in sequence with the strategies under the previous subcategory.

Table 11 Discovery-Social strategies

Subcategory	Strategies
Social strategies	10) Ask teacher for an L1 translation 11) Ask teacher for paraphrase or synonym of new word 12) Ask teacher for a sentence including the new word 13) Ask classmates for meaning 14) Discover new meaning through group work activity

2.6.1.2. VLS for consolidation of a familiar word's knowledge

There were four subcategories under the second major category, Consolidation strategies. It includes the strategies learners use to consolidate the word knowledge of words partially familiar. The details of the four subcategories and the strategies Schmitt placed under them are as follows.

I. Social strategies

Social strategies are the first subcategory of consolidation strategies. Schmitt included social strategies again under this section specifying them as the strategies learners use to reinforce what was learnt and draw secondary word knowledge by interacting with others. As mentioned earlier, they differ from the social strategies placed under the discovery strategies as learners use them to draw primary word knowledge. By including social strategies twice, Schmitt differentiated the social strategies used first for discovering and then for consolidating the word knowledge. The consolidating social strategies include practicing the words learnt in a group

which facilitates active processing, interacting with others to gain accuracy, speaking to high proficiency speakers etc. Three strategies Schmitt included in the inventory are presented in table 12. The strategies are continued to be numbered in sequence with the strategies under the previous subcategory.

Table 12 Consolidation-Social strategies

Subcategory	Strategies
Social strategies	15) Study and practice meaning in a group 16) Teacher checks students' flashcards or word lists for accuracy 17) Interact with native-speakers

II. Memory strategies

The fifth subcategory in Schmitt's inventory was 'Memory strategies' category. The memory strategies were viewed as the mnemonical strategies involving associating new word knowledge to the known word knowledge, grouping, organizing them in a pattern, imagery etc. They are traditionally the most practiced strategies. Mnemonical strategies are based on psychological principles such as developing a retrieval plan right at the time of decoding a text or an image and using it at a later time (Thompson, 1987). They assist learners in learning faster and recalling better. This subcategory had the highest number of strategies included by Schmitt as presented in table 13. The strategies are continued to be numbered in sequence with the strategies under the previous subcategory.

Table 13 Consolidation-Memory strategies

Subcategory	Strategies
Memory strategies	18) Study word with a pictorial representation of its meaning 19) Image word's meaning 20) Connect word to a personal experience 21) Associate the word with its coordinates 22) Connect the word to its synonyms and antonyms 23) Use Semantic maps 24) Use 'scales' for gradable adjectives 25) Peg Method 26) Loci Method 27) Group words together to study them 28) Group words together spatially on a page 29) Use new word in sentences 30) Group words together within a storyline 31) Study the spelling of a word 32) Study the sound of a word 33) Say new word aloud when studying 34) Image word form 35) Underline initial letter of the word 36) Configuration 37) Use Keyword Method 38) Affixes and Roots (remembering) 39) Part of Speech (remembering) 40) Paraphrase the words meaning 41) Use cognates in study 42) Learn the words of an idiom together 43) Use Physical action when learning a word 44) Use semantic feature grids

III. Cognitive strategies

The fifth subcategory in the taxonomy was cognitive strategies. They appear similar to memory strategies, but they differ as they do not involve mental manipulation such as associating and grouping of words which memory strategies do. Instead, they involve the strategies of verbal and written repetition using mechanical actions to learn vocabulary and retain it longer. Learners have become accustomed to these strategies so much that they resist giving them up and shifting to other equally effective or even more effective strategies (O'Malley and Chamot, 1990). As not all

the strategies under this subcategory involve deeper word processing, the depth of processing perspective (Craik et al., 1972; Craik et al., 1975) questions the utility of such strategies in a long-time plan. However, there were studies in the field which found that the learners attained high proficiency using these strategies as well (Schmitt, 1997). For instance, flashcards are a good source for primary word exposure, but some learners also continue to review them over time and perform well. A major advantage of using flashcards, specifically in the contemporary digital era, is that learners can access them from anywhere in their feasible time to learn using cloud-based online tools like Quizlet. The strategies Schmitt included under this subcategory are mentioned in table 14.

Table 14 Consolidation-Cognitive strategies

Subcategory	Strategies
Cognitive strategies	45) Verbal repetition 46) Written Repetition 47) Revise Word Lists 48) Revise Flashcards 49) Take notes in class 50) Use the vocabulary section in your textbook 51) Listen to tape of word lists 52) Put English labels on physical objects 53) Keep a vocabulary notebook

IV. Metacognitive strategies

The last subcategory of the taxonomy is the Metacognitive strategies. They are the meta strategies which are broader and used for effective learning. They comprise self-guided strategies such as planning, learning and evaluating oneself. For both the depth and breadth of vocabulary knowledge of ESL/EFL learners, maximizing their

exposure to English is essential. This could be facilitated by providing subject-specific or generic books in English, newspapers or magazines in mainstream media. An advantage of the current information age is that it could also be facilitated by endless online resources and social media, which are accessible for free. In the current subcategory, Schmitt included English-language media referring to broadcasted media like news on TV, English movies, songs etc. In the current study context, English-language media is also realized as web-based content, online vocabulary resources and interactive tools. The strategies Schmitt included under the subcategory metacognitive strategies are as follows. The strategies under this final subcategory are mentioned in table 15.

Table 15 Consolidation-Metacognitive strategies

Subcategory	Strategies
Metacognitive strategies	54) Use English-language media 55) Testing oneself with word tests 56) Use spaced word practice 57) Skip or pass new word 58) Continue to study word over time

Schmitt's inventory for vocabulary learning was elaborate, being distributed under six subcategories as presented. Out of the 58 strategies in the inventory, Schmitt placed 9 strategies under Discovery-Determination, 5 strategies under Discovery-Social, 3 under Consolidation-Social, 27 under Consolidation-Memory, 9 under Consolidation-cognitive and 5 under Consolidation-Metacognitive subcategories. The numbers show that memory strategies were the highest, being nearly half of the total

number of strategies in the inventory. Further, the number of strategies involving information processing (memory, cognitive, and metacognitive strategies put together) counts as 41. There are also some strategies in the Discovery-Determination subcategory, such as decoding word meaning through parts of speech or affixes, which also involve processing word knowledge. These inferences imply the significance of strategies of mental processing involved in vocabulary learning than other strategies, such as social strategies.

However, not all the strategies were viewed as readily applicable in the current study's context. Some strategies, such as "Checking for the L1 cognate", were viewed as not helpful for Indian ESL learners whose L1 vocabulary drastically differs from English. Then, the strategies like "Group words together spatially on a page" were realized differently, customizing to the study context. For instance, the strategy was realized as accessing a group of related words on an online tool's webpage, like the Visuwords' webpage that facilitates interconnected word families instead of isolated words. Thus, inapplicable strategies were excluded from the learners' choice, and the strategies that needed modifications were refined to suit the current study. Given the eliminations and modifications of the strategies done to configure the list of strategies to the ESL participants and the learning environment of the current study, a total of 42 strategies were adapted for the questionnaire used in the study. They were drawn from all the six subcategories of Schmitt's inventory. A copy of the questionnaire used for the study is attached as Appendix I.

2.6.2 Cognitive and Socio cognitive perspectives

The research into ESL/EFL learner strategies usually includes two prominent perspectives, cognitive and socio cognitive perspectives as a part of its theoretical framework. Through cognitive perspective a wealth of SLA studies emerged in the recent time under cognitive psychology. They substantially differ in the methods used and the research questions investigated from the traditional SLA studies which majorly emerge from the field of linguistics or from an approach with social orientation. This is majorly because the primary point of investigation for cognitivists is the processing involved and knowledge development among the language learners. For instance, how the mechanism of fossilization of certain words develops overtime and why it is so difficult to eradicate such structures is well understood through this perspective. The scope under cognitivist approach is as wide as spreading from the application of general models of language processing to studies on computer facilitated acquisition of discrete, integrative and interactive language phenomena (Mitchell and Myles, 1998). These encourage adopting the approach for interdisciplinary studies. However, one of the limitations of the approach is that it primarily concerns the learner as an individual and doesn't view the learner as a social being.

There is a need to also consider the social aspect as a primary factor because the learners would interact with the more knowledgeable peer group at different levels of processing the input, which results in modifying and restructuring the information in one's cognition. As Vygotsky argues in his sociocultural theory, despite the cognitive mechanism facilitating learning, social criteria also play a vital role. Therefore, the current study is based on the socio-cognitive approach rather than limited to the cognitive approach.

Language learning strategies find their theoretical base in both perspectives, cognitive perspective and sociocultural perspectives. In the cognitive perspective, learners use strategies of information-processing, for their cognitive development by improving the capacity of short-term memory and for retention of knowledge in long-term memory (Pressley & McCormick, 2007). Cognitivists believe strategies are complex cognitive aids that learners use to maximize the potential for learning a language and the effectiveness of learning. They also view that learners are said to have used language learning strategies effectively if they have automatized the use of strategies (Mitchell, Myles and Marsden, 2013). In contrast, through the sociocultural perspective, use of a strategy is believed to be a meta function, such as planning, analysing, synthesizing and evaluating, that a learner develops in a sociocultural context with the help of more capable people (Oxford & Schramm, 2007). Vygotsky's cultural-historical theory is the base for sociocultural theory which at its core argues that human development is a resultant of interactions among the individuals and the social environment around them. Zone of proximal development (ZPD), a sociocultural concept closely associated with second language learning through the use of strategies. Learner practices social strategies such as asking questions to know or clarify something from a more capable learner, teacher or any other individual. Consequently, they are assisted by the more capable individuals to cross the ZPD (Oxford & Schramm, 2007).

2.6.3 Perspectives of Connectionism

Advancement in computer technology has given a new shape to Edward Thorndike's materialistic theory of connectionism. Since the mid-1980s, a growing

number of studies have applied the connectionist Stimulus-Response (S-R) framework. It believes that information processing in the human brain is initiated by a stimulus and the function appears similar to that of a computer. Large neural networks in the human brain operate through stimuli as the numerous complex programs in a computer execute through commands. The theory believes the mind is the functional organization of the brain, which operates by activating specific neural combinations for each learning operation. It also believes that such combinations get stronger through repeated stimuli. Connectionist neural networks operate as algorithms or programs computed and executed on a computer (Cummins and Schwarz 1991, Roth 2005). Therefore, it is believed that the human mind executes learning processes acting as neural software (G. Piccinini, 2010). From a connectionist perspective, learning occurs by associative processes rather than by construction of abstract rules. Similarly, vocabulary learning in human cognition also progresses in a gradation by looking for relationships among the words and associating them, forming lexical networks as understood in the SLA domain. The associations among the words get stronger as the words and the relationships they share keep recurring, which see an increased probability in the contemporary technology-driven time through vocabulary exposure over time, in and out of the classroom.

Furthermore, connectionists believe that the human mind is predisposed to look for associations between different learning elements, create links between them and store them together (Fitzpatrick, 2007) as a computer saves related files at a common location. The stimuli to the brain regarding vocabulary learning include encountering a new word by the learner, noticing its form and being willing to learn different dimensions of word knowledge. While they stimulate vocabulary learning, the mechanism is mediated by the learning environment. In the current time, the use

of e-VLS and the online learning tools by the learners could be a part of the learning environment. The response to the stimuli in such a learning environment could be the vocabulary learning outcome with deeper word knowledge.

The application of connectionism in the ESL/EFL domain in the contemporary digital era could be realized by encouraging learners to use online learning platforms that facilitate learning input closely related to human cognition. As a result of the recent web technological advancement, there emerged online tools like Visuwords, which facilitate word families in an interconnected format resembling the associations learners make while learning vocabulary. Connectionism could also be applied by encouraging the learners to integrate the use of online tools that facilitate reinforcement activities such as written repetition, repeated pronunciation, testing oneself until mastery, fun-filled matching or gaming etc. Some online learning tools like Quizlet, designed based on recent research, could facilitate such reinforcement. Therefore, integration of such online tools could manifest recurrence, argued by connectionism, to strengthen learners' word associations in and out of the classroom.

2.6.4 Three memory models relevant to the use of VLS

The memory-based theories lay a foundation for the necessity for using vocabulary learning strategies for effective learning (Gu, 2005). The three memory models mentioned below provide a rationale for the significance of exercising varied vocabulary learning strategies for such effective vocabulary learning.

2.6.4.1 Depth of Processing Theory

The 'Depth of Processing Theory' proposed by Craik and Lockhart (1972) interprets the learner strategies into deep and shallow strategies. It argues that effective learning directly depends on the level at which the information is processed.

The deeper the processing carried out while learning the information, the more favourable it is for learning. With reference to memory, it argues the deeper the learners' information is processed, the more probability that it is retained in the learners' long-term memory. With reference to VLS, the research has found that some deep learning strategies which demand a deeper mental processing, for instance, the semantic mapping strategy or the imagery strategy will enhance retention of target words (Cohen & Aphek 1980; Pressley et al. 1982). In contrast to deep learning strategies, the theory argues that the shallow learning strategies with which the target word is processed at a superficial level, such as note taking, word repetition, rote memorization, use of conventional flashcards etc. would result in lower retention and are viewed as less effective strategies.

2.6.4.2 Ebbinghaus's (1913) forgetting curve model

Ebbinghaus's (1913) memory model argues for the decline of information retention over time and the necessity to carry out information reviews at intervals to address it. It believes that most of the new information is forgotten immediately after learning, and comparatively, a static state is reached after an hour when the forgetting process slows down. Ebbinghaus argues that newly learnt information would continue to be forgotten if the learners made no conscious attempts to review the information learnt over time.

2.6.4.3 Scott Thornbury's (2002) vocabulary learning model

Thornbury (2002) views that learning vocabulary at its core means to retain what is learnt. He proposed the elements of word knowledge important to be learnt and the practices which help in transferring such newly learnt information into the long-term memory.

He discusses different elements of word knowledge, saying that it is important for the learners to know ‘what is in a word’. The prominent elements he discusses are, word classes, word families, word formation processes, multi-word units, collocations, homonymy, polysemy, synonymy, antonymy and lexical fields.

The practices he proposed which help to transfer the word knowledge into long term memory include repetition, retrieval, spacing, pacing, imaging, active use of mnemonic strategies, motivating to learn and retain word knowledge, conscious learning with attention/arousal and learning words at a greater cognitive depth.

2.7 Summary of the chapter

In the current chapter, an overview of the literature review carried out for the study was given. At the beginning of the chapter, an account of the literature available on LLS was given as it includes research on VLS as its subset. The section focused on different strategies identified, defined and classified into respective taxonomies. The prominent studies among the LLS studies were emphasized and their taxonomies were reviewed in detail. Then the chapter presented the significance of vocabulary in the SLA domain and the complexity of learning vocabulary. In the next section, an account of the prominent VLS studies was given and their respective taxonomies were reviewed. In the last section of the chapter, four theoretical foundations for the current study, which include Norbert Schmitt’s (1997) VLS inventory, Cognitive and Socio cognitive perspectives, Perspectives of Connectionism and the memory models relevant to the use of VLS were depicted.

Chapter 3 Methodology

3.0 Overview of the chapter

The primary objective of the current study was to explore the e-Vocabulary learning strategies of ESL learners used in an ICT enhanced learning environment. It also emphasized on understanding the learners' perceptions on online vocabulary learning and the use of online learning tools. The chapter gives an account of the suitable research methodology chosen in view of the objectives of the study. It begins by describing the details of the participants of the study. Then it gives an account of the research tools chosen and the research design adapted. In the following section, it describes the online learning tools included in the study. Thereafter, it describes the procedure followed to collect the data and its analysis. The chapter ends with the description of the data analysis procedure relating the data collection tool, the nature of the data and the research question answered. that was carried out on the data drawn from different research tools with respect to each research question is mentioned.

3.1 Participants

The participants and the study site were chosen in view of the prerequisites they must possess. As the study requires a set of learners at least with a minimal vocabulary competency suitable to add new vocabulary and considerably a good technical skillset to access the online tools, the tertiary learners were considered to be suitable. The researcher aspired for a study site that could facilitate an ICT-enhanced autonomous learning environment. Therefore, it was decided to approach the students from a Technical higher educational institution. The study participants were chosen from the International Institute of

Information Technology Hyderabad (IIITH), Hyderabad, India. A convenient sample of students enrolled on MSIT, a postgraduate program, was chosen for the study.

As a part of the MSIT course work, they had Communicative English and soft skills as one of their subjects. However, the study was not conducted as a part of their course but as a separate study. The number of participants who turned up for the study at the beginning and filled the pre-intervention questionnaire were 45. However, the net data was drawn from 36 participants as the rest of the participants discontinued in between for different reasons, majorly for finding it difficult to continue to be a part of the study having enrolled into MSIT, a course designed with a hectic schedule and dense syllabus. Each learner in the course had regular access to one's own desktop/laptop, uninterrupted internet connection and a smartphone to do their daily learning tasks. They follow 'learning by doing' approach in which the students are not taught by any teachers but are assisted by mentors in case of any help while learning by themselves making use of the online content and other resources they are given access to by the mentors.

The sample was found suitable for the current study for two prominent reasons. First, having completed their schooling and graduation in predominant conventional mode of learning they would reflect on their usual practices of vocabulary learning used so far which help in understanding their VLS under use. Their reflections would represent the commonly prevailing practices of the majority of the ESL learner community. Second, having enrolled into a course that encourages ICT facilitated learner autonomy similar to the interests of the current study, they could easily adapt to the intervention of the study and reflect their experiences of learning vocabulary during the study. Such reflections facilitate an understanding of the e-VLS used by the learners while learning vocabulary using online learning tools. Their reflections would also help in deriving implications for the current

language learners, who are expected to practice increased online learning in near future. The ICT enhanced learning environment provided in the institution to propagate learner autonomy was also an edge for the study. It facilitated learners a scope for carrying out their daily learning practices on individual devices, using online content regularly and availing uninterrupted internet in each classroom, which is not yet the commonly prevailing practice in majority of the school and college level institutions in the Indian academic sector. The participants were from two genders and were of the age group 21-25 years. The participants were heterogeneous with different language proficiency levels and geographically coming from not just the Telugu states but also from some other states of the country.

3.2 Research tools

For the studies on learning strategies, the use of self-reporting procedures is the best practice to identify the abstract learning strategies used (Chamot, 2005). This study also includes such self-reporting tools. The reliability of a self-reporting tool is ensured by correlating it with data from other tools including the researcher's field notes. Following are the four research tools included in the study:

3.2.1. Questionnaire

A 5-point Likert type scale Strategy Inventory for Vocabulary Learning (SIVL) of 42 strategy items adapted from Nobert Schmitt's Vocabulary Learning Strategies Questionnaire (1997) and R.L. Oxford's Strategies Inventory for Language Learning (SILL, 1990) Version 7.0 was used as the questionnaire for the study. Some VLS of Schmitt's taxonomy which appeared not practicable in the context of the current study setting such as, "Check for L1 cognate", "Interact with native speakers", "Loc Method" etc., were not included in the questionnaire. Some other strategies,

such as 'Use Semantic maps' were realized to be practiced using online learning tools. The questionnaire was piloted with a small learner sample and some statements were refined and elaborated using simple language for better comprehension, based on the participants' feedback. Overall, the questionnaire had 42 strategy items and it was administered to the learners before and after the intervention. A copy of the questionnaire used in the study is attached as Appendix I.

3.2.2 Learners' guided reflective journal

A reflective journal with specific prompts such as "The most useful strategies in understanding the words are (briefly mention why they are useful)" was used as a research tool to collect learners' experiences after doing each of the seven tasks. The prompts in the reflective journal were intended to probe the learners on the learning process they undergo while learning words using online learning tools. A copy of the guided reflective journal is attached as Appendix II.

3.2.3 Researcher's field notes

The third research tool used in the study was the field notes maintained by the researcher. The researcher, the facilitator, kept track of the observations made during the intervention as field notes. The observations noted contributed to the analysis of the data collected from the questionnaire and the reflective journals and to triangulate the findings wherever required. They also helped in drafting questions for the learners' interviews. A copy of researcher's field notes is attached as Appendix III

3.2.4 Semi-structured participants' interviews

Based on the learners' reflections shared in their reflective journals and the classroom observations, eight main questions were built to carry out semi-structured interviews. In addition to the main questions, there were follow up questions and sub questions subjective to individual reflections and instant interview responses. The interviews were conducted for 15 randomly selected participants. The interview responses were used as a source of data and to triangulate the findings from other tools. A sample copy of the main questions, follow up questions and sub-questions used for a participant's interview is attached as Appendix IV.

3.3 Research design

The study was a mixed methods study as it used both quantitative and qualitative data collected to answer the research questions. The data was collected using four research tools that were mentioned in the previous section. It is exploratory in nature attempting to find out the e-VLS used by the learners while learning vocabulary using the online learning tools. It adapted a non-experimental design by including an intervention to explore the strategies used before and after the treatment by the same sample. The study did not have a separate controlled group. The treatment in the study refers to learning vocabulary using online learning tools in the study. The findings from the qualitative sources as that of reflective journals and the classroom observations were used to triangulate the findings derived using quantitative research tools in the study.

3.4 Online learning tools used in the study

In the contemporary digital era, there are various online platforms available for free with good potential which could be effectively used as learning tools for English language learning in general, and vocabulary learning in specific. Though some of them limit their free access with a timeline and provide access only to selected options, there are also platforms with free and unlimited access to multiple functions which could meet the needs of academia. Three such tools were included in this study and suggested the learners to integrate them in their vocabulary learning. However, learners were still kept open to access any other platforms with similar potential to meet their needs better, with the consent of the researcher. The rationale for choosing the three online tools is that the multifaceted VLS revealed in the literature could be practiced using them if an awareness on how to operate them is brought among the learners. The tools also have an edge over other similar online tools in various respects. First, the other tools with similar learning potential restrict access to a limited content and/or for a limited time but these tools are given unlimited content access and for all the time. They also facilitate word knowledge in a simplified language and in a well-organized format which is convenient for both competent and struggling learners to comprehend. Then, they have the potential to facilitate both breadth and depth of word knowledge reviewed in the literature chapter. The rich lexical information provided on the tools range from the primary meaning of a word to developing a big picture of its semantic field. There is also a scope for carrying out learning by problem solving, practicing assessment for learning and learning by playing fun filled games. Such practices are referred to as VLS in different taxonomies presented in the previous chapter.

Encouraging the use of the online tools was aspired to widen the scope for exercising the strategies by acting as new learning spaces inside/outside the classroom. They may also

increase the opportunities to learn vocabulary by repeated practice, improve the contextual learning (by exposing the learners to the contextual word use available on the tools) and provide interactive platforms to put vocabulary to use and share with peers.

With respect to the literature reviewed on VLS, the tools vary in their potential from facilitating discovery strategies to the consolidation strategies, such as cognitive and metacognitive strategies categorized in Norbert Schmitt's (1997) taxonomy of VLS. While choosing the online learning tools included in the study, they were analysed by relating their features with the possible VLS that learners could practice using them. A brief note on the tools provided in the following section would relate them to the study.

3.4.1 Yourdictionary

The first online vocabulary learning tool included in the study is an online dictionary named "Yourdictionary". It assists learners more than a dictionary does with its multifaceted design. It has different columns built on it named dictionary, thesaurus, contextual sentences, Examples (authentic texts), Knowledge (graded content provided for different levels of the learners using the target word) and more. The column 'more' provides additional information like grammatical and etymological word knowledge. The resource could be used as an effective learning tool as it has the edge over similar resources with its learner-friendly interface to access the columns mentioned and its easy-to-understand word meanings. A prominent reason for including the dictionary in the study is that its mission is to provide unfamiliar words to learners with easy-to-comprehend meanings in clear and simplified language, as stated on its website (<https://www.yourdictionary.com/dictionary-definitions>) and as seen in its functionality. Such an approach could make both struggling and successful learners comfortable while learning. Another reason, as its webpage also conveys, is

that its learning material reaches far and wide, guaranteeing the most accurate definitions of a word as many other standard platforms do. The material is not just created by the host but also drawn in collaboration with authoritative sources (on various subjects) such as "Webster's New World College Dictionary, 5th edition", "American Heritage Dictionary of the English Language, 5th Edition", "Computer Language Co. Computer Desktop Encyclopaedia", "Wiktionary" etc. Despite that, it is comparatively an easier version among the similar online dictionaries available. Along with providing the definitions of words, it also facilitates supplementary pictorial representation for some words. A sample target word, "Accumulate", is displayed as presented in figure 3.1. In addition to providing authentic sentences for learners' reference, the tool also provides prominent quotes of noble people using the target word if learners find their interest to refer.

Figure. 3.1. A web page from “Your dictionary” displaying a sample target word “accumulate”

The screenshot shows a web browser window with the URL <https://www.yourdictionary.com/Accumulate>. The browser's address bar and tabs are visible at the top. Below the browser window, the website's navigation bar includes links for DICTIONARY, THESAURUS, EXAMPLES, QUOTES, SPANISH, REFERENCE, and WORD FINDER. The main content area features the 'YOUR DICTIONARY' logo, a search bar with the word 'Accumulate' entered, and tabs for DEFINITIONS, SYNONYMS, SENTENCES, and QUOTES. The definition section for 'accumulate' (ac-cu-mu-late) is displayed, including a pronunciation guide, a sentence example, and a photograph of snow accumulated on a sidewalk. A 'Link/Cite' button is also present.

accumulate  ac-cu-mu-late

Use **accumulate** in a sentence

verb

The definition of accumulate means to gather together over time.

An example of accumulate would be the amount of snow on the ground building up during a winter storm.

YourDictionary definition and usage example. Copyright © 2018 by LoveToKnow Corp

[Link/Cite](#)



A storm has caused snow to accumulate on the sidewalk.

It was believed that the interface with its potential could facilitate many VLS for the learners in their process of drawing word knowledge using it. For instance, if they look up for a meaning, in turn they practice the “Determination strategies” (ex. Use a monolingual dictionary, self-reference skills etc.). Further, when they check for other meanings of the words to know new ones or to link to the ones that they might already know, there is a scope that they engage their Memory strategies (ex. Associating the new and old information, connecting the word to its Synonyms and antonyms). Instead, if they listen to the pronunciation of the word, they may engage their cognitive strategies (ex. Integrate orthographic and spoken forms by listening to pronunciation). They can also go through the sample sentences and quotes given using the words and attempt to form their own sentences in class or even later. In such a case, they may access the dictionary over the smartphone outside the class too engaging their metacognitive strategies (ex. Continue to study the word over time outside the classroom). The belief came true during the intervention as the tool facilitated a variety of VLS adapted from Schmitt’s (1997) taxonomy.

3.4.2 Visuwords

The second tool included in the study for sensitizing the learners with word knowledge is an interactive online resource, “Visuwords”. It is a visual thesaurus that displays the target words by mentioning their word classes, associating them with related words, and providing other possible inflections. It visualizes the learners to the deeper vocabulary aspects like the lexical field of the words and their word families. While a conventional resource displays words statically in isolation, it displays the words dynamically (flexible to click and expand its associations) in their respective lexical networks using its interactive interface. To help learners differentiate the word

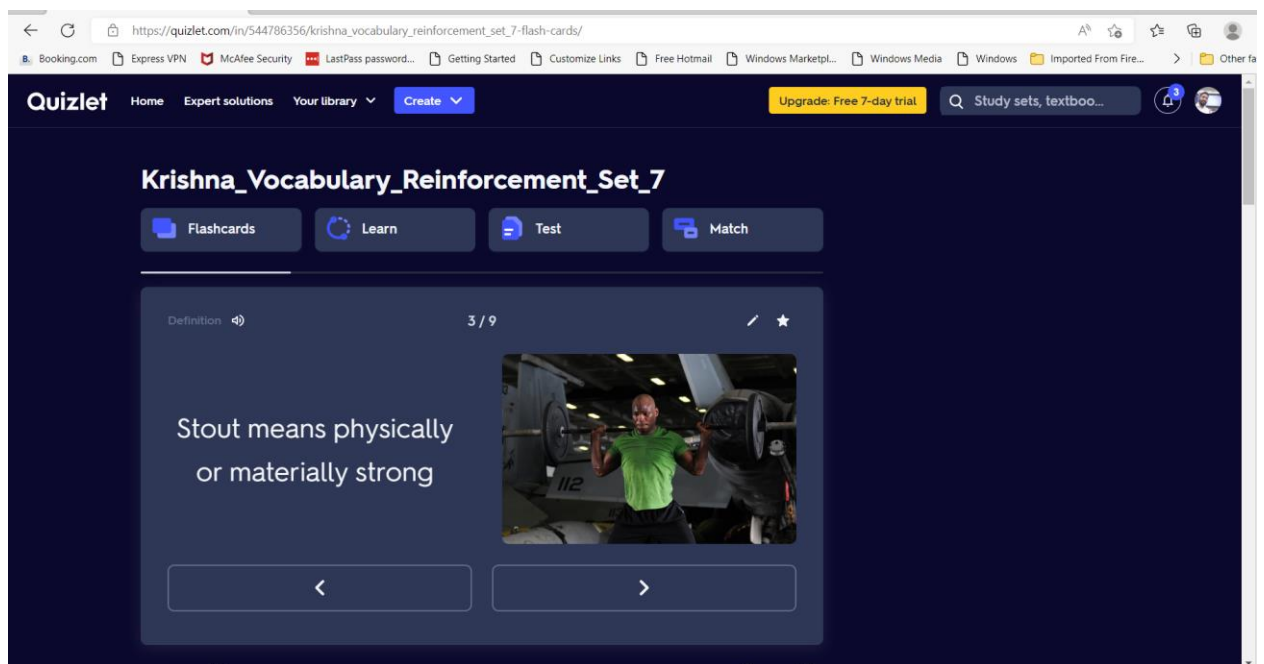
3.4.3 Quizlet

Quizlet is an interactive online learning platform on which an instructor could create vocabulary study sets customizing to his/her learners' needs and cater among them to learn collaboratively. It is an open source currently used by two thirds of the academic institutions in the US (<https://quizlet.com>, <https://en.wikipedia.org/wiki/Quizlet>) and the free version is available for learners' use across the nations. There are multiple reasons for including Quizlet as a learning tool in the study. It is easy to customize to the learners needs, teacher friendly to create study sets, could be used as a tool for graded learning such as learning for the first time, reinforcing the difficult words, testing what is learnt, evaluating oneself and relearning if necessary. It is flexible as it is available in both web and app versions compatible on a computer or a smartphone to access in and out of the classroom.

It has an interface that could facilitate vocabulary learning through learner friendly modes (options) and games available on it. The learners could click on any of the modes to study, such as 'Flashcards' to study a word with its definition/meaning on flip sides of the virtual flashcards, 'Learn' to go through difficult or all words by changing the option, 'Write' to practice writing definition of words, 'Spell' to practice the spelling of the word and 'Test' if to test oneself. A sample vocabulary study set built on Quizlet (for Set 6) is accessible at the URL:

[Krishna Vocabulary Reinforcement Set 6 Flashcards | Quizlet](#). A flashcard built for 'Stout', a target word in vocabulary study set 7 on Quizlet, is displayed in figure 3.3.

Figure. 3.3. A flashcard built for the word “Stout” on Quizlet



In the games section, it has fun filled learning games, ‘Match’ and ‘Gravity’.

‘Match’ is a fun-filled game, which in a time bound manner instructs the learners to match the words with their meanings learnt. ‘Gravity’ is another game in which information related to a word keeps scrolling down vertically, appearing like an asteroid and the learner is expected to type the word that goes with it before it strikes the bottom of the screen. It is flexible to alter the type of the game and the difficulty level. The words answered incorrectly get repeated with high frequency and a dashboard shows the learning progress overtime. It assists the learners with its immediate feedback when a learner goes wrong popping up both the right and wrong answers submitted.

While learning using the tool, it could facilitate numerous VLS of learning, reinforcement, testing and evaluation. Its multimodal design acts as a platform for rigorous practice, learning with immediate prompts, learning by playing, practicing

assessment for learning approach and for planning to learn in a feasible time and space (Spaced word practice). In other words, learners could practice both discovery as well as consolidation strategies. Practicing VLS such as ‘Use spaced word practice’ and ‘Continue to study words over time’ imply the potential of the tool to facilitate metacognitive strategies.

3.5 Procedure followed for the study

The procedure followed for data collection, which included administering the questionnaire, familiarizing the learners with VLS in Schmitt’s taxonomy (1997), orienting the participants on the use of online tools, administering tasks, collecting learner responses etc., was carried out in the following steps:

- I. Before administering the questionnaire to the whole sample, it was piloted with a smaller group. If there were any challenges in understanding any of the 42 strategy items in the questionnaire, terminology used or in responding to the strategies etc. were resolved as per the participants’ feedback. As mentioned during the description of the questionnaire, a 5-point Likert-type scale was used.
- II. Then, it was administered to all the participants to understand the VLS in their practice before the intervention. While answering the questionnaire, they were assisted if there was a difficulty still. The participants were clearly instructed to retrospect before rating each strategy. The first administration of the questionnaire facilitated an understanding of the strategies in learners’ practice and those which were not.

Note: To understand the VLS used before the intervention and the e-VLS used during the intervention (while using the online learning tools), the questionnaire was administered twice to the participants in the study; once before the intervention as mentioned above and then after completion of the intervention.

III. An orientation session was conducted on accessing the three online learning tools included in the study. Nevertheless, the participants were encouraged to use any other online tool they may find with similar learning potential with the researcher's consent. In this regard, when a few participants brought another online tool, 'wordhippo', to the researcher's notice as a helpful tool during the intervention, its functionality was reviewed and agreed with participants to use it. It was done because the currently available online learning tools might turn outdated or unavailable in the ever-emerging technological world, and some other contemporary tools might emerge. It was viewed that familiarizing the learners with the evolving online tools was necessary rather than restricting them to specific tools. Moreover, rather than which online tools they might use, what processes they were undergoing and which strategies they were using were of priority. Therefore, the orientation session was intended to familiarize the learners with the online tools and make them aware of how to draw word knowledge using different functions available on the tools. A few sample words were explored using the tools and demonstrated to the learners in the session.

IV. The study's intervention began by presenting the target words in a context-driven text. The participants were given a task which had section A with a reading text and four following sections, B,C,D and E with activities to be done by them after

reading the text in an hour or slightly more than that if required. The tasks used in the study are attached as Appendix V. The text in section A embedded with highlighted target words was given instructing the participants to read and comprehend it. After reading the text, their familiarity with the target words was checked in section B on a graded scale (ranging from “Hardly know the word” to “Know the word to put to use”). This check was intended to note the level of familiarity at the beginning of the task. While the orientation session and initial data collection task were carried out in a face-to-face classroom the following tasks were done by using the Zoom platform (due to the COVID-19 pandemic). The sets of target words included in the tasks were in a gradation. The earlier tasks had high frequency academic words derived from the Academic Word List (AWL). Later on, the difficulty level of the word sets was raised by adapting the less frequent words from competent sources as ‘The Hindu’ editorials and the standardized test extracts from the online sources.

- V. Then the learners were taken through a process in five steps as described below to gain primary and secondary word knowledge during the intervention. The one-hour intervention session was carried out in two phases adhering to Norbert Schmitt’s (1997) theoretical framework of VLS. According to him, the strategies for vocabulary learning are used at two levels, as presented in the literature review. Firstly, at the discovery level of gaining primary word knowledge, and secondly, at the consolidation level consolidating the secondary word knowledge and storing it in the long-term memory.

- 1) The first phase of learning was intended to enable learners to discover the primary word knowledge, such as the form and meaning of the words, using discovery strategies. For which, section C in every task (See Appendix V) was designed in a tabular format instructing the learners to explore the different forms for the target words, fill the table with different classes of the words, and understand their primary meaning.

During the phase, they were encouraged to use the online dictionary, “Yourdictionary”, then the visual thesaurus, “Visuwords”, and then “Quizlet” (on Quizlet, suggested to access just flashcards at the beginning to draw primary word knowledge). As described in the tools section, the first tool, “Your dictionary”, was expected to facilitate easy-to-comprehend word knowledge and contexts of word use for the learners at this phase. The second tool, “Visuwords”, a visual thesaurus, was believed to provide learners with the interactive visual representations of the word forms and relationships in their word families. The flashcards on “Quizlet” were viewed to provide them with primary definition/meaning supplemented with an appropriate image.

- 2) After exploring the words, they were instructed to do the next activity in section D which requires them to produce the target words with their primary meanings, as they understood from the tools, in the space provided. They were also instructed to discuss with their peers or the facilitator if they needed any help. By these processes learners were expected to have got better familiarity with the form, meaning, inflections and derivatives of the word family prior to gaining further word knowledge. This was the end of the first phase of learning a word by discovering the primary word knowledge. Followed by this, the learners were

suggested to carry out the second phase of learning word knowledge, the consolidation phase.

- 3) In the Second phase, the learners were encouraged to explore the words further emphasizing on their use in varied contexts and put them into practice. Under the same section, Section D, (See Appendix V) they were also instructed to choose any two words of different classes from the table they filled and produce authentic sentences of their own or by adapting from the online dictionary. The online dictionary, 'Yourdictionary' readily facilitated diverse sentences using the target words with their collocates. It was viewed that the authentic sample sentences of the target words and their collocations could expose learners to variety of contexts in which the words could be used and encourage them to initiate their own sentences. They were made to solve the activity by gaining word knowledge on all possible meanings of the words to produce the meaning they understood. They were encouraged to put the words into use by forming sentences for the parts of speech of their choice. After writing the sentences, they were suggested to identify more frequent collocations for the words and use them in their oral sentences sharing with the group.
- 4) Moving ahead with the consolidation phase of their learning, under the following section E, they were instructed to use the option 'Learn' on Quizlet for reinforcement. It facilitated repeated practice of the target words learnt and their use in different forms in varied contexts.

5) In order to turn their learning more interesting and engaging, they were encouraged to use, 'Test' and fun filled games, 'Gravity' and 'Match' on Quizlet. Though they were encouraged to assess themselves using the 'Test' option, the objective of the assessment was not to test the learners but to enable them to learn using the automated feedback through an "assessment for learning" approach. They were encouraged to try the 'Gravity' game or do the matching quiz provided with their interest. They were informed that these activities were activities of fun and further practice. Different activities carried out by the learners in the second phase were meant to enable them to consolidate the secondary word knowledge with the primary word knowledge gained through the first phase. The consolidation phase was a not a passive learning phase but an active learning and production phase as they gained the word knowledge by engaging with variety of contexts of word use, solved the activities given, manipulated the word knowledge and did the exercises on Quizlet.

Note:

While undergoing the five steps described above, the learners would have got opportunities to learn in multiple ways, in other words would have engaged various vocabulary learning strategies. Their ways of learning would have differed while using the online tools from the ways they had learnt earlier. To draw such insights, they were made to share their learning experiences and reflections in the reflective journal which was given as a separate document with the task. In fact, along with the task, they were provided with two more documents on Google classroom. The second document was a consolidated list of the strategies which were there in the questionnaire. It was provided for their reference while doing the

task. The third document was a reflective journal (Attached as Appendix II) which was instructed to be filled immediately after completing the task and submit them together.

- VI. After completing each task, the learners were made to reflect on their learning experiences in the guided reflective journal given to them. It included specific prompts such as "The most useful strategies in understanding the words are (briefly mention why they are useful)". The prompts aimed to probe the learners on their word learning process while learning with online tools. They took the learners in the intended direction of eliciting learners' responses on all the e-VLS they might have used, which were helpful for the study.
- VII. After completing the task and the reflective journal, learners were instructed to submit both documents on Google classroom.
- VIII. After completing the procedure described above for all the seven tasks (Appendix V) with target words scheduled one each week, the post-intervention questionnaire was administered to understand the current strategies of the learners after intervention. The strategies used before and after the intervention were compared during the data analysis. This was intended to specifically elicit the e-VLS used by the learners while learning words using the online tools.
- IX. The researcher maintained a field notes (Appendix III) to make observations during the intervention. The notes were useful in tracking the participants' strategies, responses, difficulties if any. The progress of the study was noted and made decisions from time to time accordingly with the consent of the research guide.

- X. Later, the participants were randomly called for their semi-structured interviews to interact individually, collect their experiences and perceptions on learning vocabulary online and on the use of online learning tools. The interview responses were useful in data analysis and in triangulating the findings derived from other data collection tools.

The results of the study were presumed to be multifaceted. It was because the learners' earlier strategy choices may differ slightly or significantly from their choices while using online tools. Concerning the frequency of their use, they might align or differ with the frequently used strategies found in the earlier studies in the field carried out in a conventional classroom without integrating online tools. The learners may shift to some strategies that were not used in their learning earlier too. Therefore, the intervention was carried out, keeping it open for such results. They will be presented in the following results chapter.

3.6 Data sources for analysis

- a. The data to answer the first research question was obtained by drawing the differences between the post-intervention and pre-intervention questionnaires. The variations in the strategies opted before and during the intervention with online tools would inform the e-VLS they used. They are validated with the inputs from the reflective journals of the participants and researcher's field notes.
- b. The data to answer the second research question was obtained from the post-intervention questionnaire, reflective journals and the field notes. The reasons behind the probable differences in the frequency of use of different e-VLS were drawn from the learners' reflections and semi-structured interviews.

- c. The data to answer the third research question was obtained from the post-intervention questionnaire responses of high proficiency and low proficiency learner groups and validated using their respective views in reflective journals. The variations among the e-VLS used by the learners of different proficiencies are analysed and presented in the following results chapter.
- d. The data to answer the fourth research question was obtained from reflective journals, semi-structured interviews and the researcher's field notes. Multiple open-ended questions were designed and posed to the participants in their interviews to elicit their views and suggestions on learning using the online learning tools.

3.7 Summary of the chapter

In the current chapter, an account of the research methodology chosen in view of the objectives of the study is depicted. Firstly, it described the participants' details. Then it elaborated on the four research tools chosen for the study. In the following section, it described the research design adapted and the online learning tools included in the study. Thereafter, a detailed description of the procedure followed for data collection was given. Towards the end of the chapter, a description of the data analysis procedure followed by relating the data collection tool and the nature of the data with the research questions was given. The following chapter would present the results of the study.

Chapter 4: Results

The current study was carried out with four objectives. First, to explore the e-Vocabulary learning strategies used by the ESL learners. Second, to understand the learners' priorities among the strategies used. Third, to identify the differences among the strategies' use in relation to learners' language proficiency and fourth, to investigate learners' perceptions on learning vocabulary online and on the use of online learning tools. The study had four research questions, mentioned in the following sections, which were configured to four objectives respectively. The research questions were explored by adopting a mixed method model. It included the quantitative descriptive analysis of the data collected using pre-intervention and post-intervention questionnaires, and qualitative analysis of the data collected using the reflective journals, researcher's field notes and participant interviews. Results from the quantitative analysis were triangulated with the qualitative results to establish significance of the findings. In the chapter, the results of the first three research questions are presented with both qualitative and quantitative analysis and those of the fourth research question are presented exclusively with qualitative analysis. The results are reported under four research questions and are concluded at the end of the chapter.

4.1 Research question 1

What are the e-vocabulary learning strategies used by ESL learners for learning vocabulary using online learning tools?

The first research question is directed to explore the e-Vocabulary learning strategies that are used by the ESL learners when they access online learning resources and encouraged to use such tools. The first set of data to answer this

question was drawn from the vocabulary learning strategy inventory used in the study. Then the results were triangulated with the findings from the other data sets- reflective journal and the field notes. The inventory used in the study to understand the strategies used by the participants has a five-point Likert scale. It has 1 representing “*Never true*”, 2 “*Usually not true*”, 3 “*Somewhat true*”, 4 “*Usually true*” and 5 “*Almost always true*” indicating the frequency of strategy use. The same questionnaire was administered twice to the participants; once, before the intervention of the vocabulary activities and then, after the completion of all the seven activities using the online learning tools. They were administered using two separate google forms titled the ‘pre-intervention questionnaire’ and the ‘post-intervention questionnaire’.

Upon downloading the responses of the participants from the two forms into separate excel documents, each response in both documents was scored. The scoring ranged from 1 to 5 for the five choices the participants had on the scale, as mentioned in the above paragraph. The sum of the participants’ responses for each of the five choices were counted against each strategy. Refer to Appendix VI. The responses for the first two choices, “*Never true*” (1), and “*Usually not true*” (2) were treated as negative responses in using a given strategy whereas the last two choices, “*Usually true*” (4) and “*Almost always true*” (5) were considered positive. The responses to the third choice, “*Somewhat true*” (3) were not considered positive for the ambiguity it carries. The sum of the number of responses for the last two choices, 4 and 5, was calculated and the percentage out of the total 36 responses was calculated. This was done similarly for the responses of both the questionnaires as displayed in Table 4.1. The category of the strategies presented in the second column of the table are marked in separate colours to identify each strategy with its respective category easily when

further analysis is carried out and presented in tables while answering the research question.

Table 4.1 Analysis of the Pre and Post intervention responses on the use of the e-VLS

S.No.	Category of the Strategy	Vocabulary learning strategy	Pre-intervention Responses		Post-intervention Responses	
			Sum of the responses for 4 & 5	% of the responses for 4 & 5	Sum of the responses for 4 & 5	% of the responses for 4 & 5
1	Discovery-Determination	1) I guess meaning of a word from its context	26	72.22	34	94.44
2	Discovery-Determination	2) I look for meaning or the paraphrase of a word in an online dictionary	23	63.89	33	91.67
3	Discovery-Determination	3) I find the words with similar meaning	13	36.11	31	86.11
4	Discovery-Determination	4) I find out the part of the speech of the given word	6	16.67	23	63.89
5	Discovery-Determination	5) I look for related forms of the word noticing their prefixes or suffixes	9	25.00	18	50.00
6	Discovery-Determination	6) I use online flashcards to know the meaning using the definition or a picture given	1	2.78	27	75.00
7	Discovery-Determination	7) I refer to sentence(s) with the new word	10	27.78	33	91.67
8	Discovery-Determination	8) I observe any pictures given in a text related to the words used	10	27.78	29	80.56
9	Discovery-Social strategy	9) I ask other learner for paraphrase or a similar word	12	33.33	16	44.44
10	Discovery-Social strategy	10) I ask facilitator for paraphrase or a similar word	12	33.33	17	47.22
11	Discovery-Social strategy	11) I ask other learner for mother tongue translation	11	30.56	6	16.67
12	Discovery-Social strategy	12) I ask facilitator for mother tongue translation	8	22.22	8	22.22

13	Discovery-Social strategy	13) I discuss the meaning of a word or sentence with another learner	9	25.00		20	55.56
14	Discovery-Social strategy	14) I discuss the meaning of a word or sentence with the facilitator	8	22.22		16	44.44
15	Consolidating-Social strategy	15) I study and practice meaning in a group	2	5.56		25	69.44
16	Consolidating-Memory	16) I think of links between what I already know and the new word knowledge I gain	22	61.11		30	83.33
17	Consolidating-Memory	17) I try to use new words in speaking or writing to remember well	12	33.33		29	80.56
18	Consolidating-Memory	18) I study a word connecting it to a given pictorial representation	12	33.33		27	75.00
19	Consolidating-Memory	19) I refer to more sentences using the word	13	36.11		31	86.11
20	Consolidating-Memory	20) I connect the word to its synonyms and antonyms	22	61.11		30	83.33
21	Consolidating-Memory	21) I use online Semantic maps (group/map of related words) to learn words	2	5.56		28	77.78
22	Consolidating-Memory	22) I use flashcards to remember new English words better	2	5.56		26	72.22
23	Consolidating-Memory	23) I physically act out new English words	3	8.33		14	38.89
24	Consolidating-Cognitive	24) I study and practice spelling of a word	9	25.00		25	69.44
25	Consolidating-Cognitive	25) I say new word aloud when studying	8	22.22		20	55.56
26	Consolidating-Cognitive	26) I remember other forms with suffix/prefix learnt	5	13.89		17	47.22
27	Consolidating-Cognitive	27) I paraphrase the word meaning on my own	17	47.22		27	75.00
28	Consolidating-Cognitive	28) I maintain a vocabulary notebook	0	0.00		7	19.44
29	Consolidating-Cognitive	29) I listen to and practice the pronunciation of a word	11	30.56		32	88.89
30	Consolidating-Cognitive	30) I say or write new English words several times	8	22.22		17	47.22
31	Consolidating-Cognitive	31) I use the English words learnt in different ways	12	33.33		26	72.22

32	Consolidating-Cognitive	32) I visualize the flashcards to recall words learnt	1	2.78		27	75.00
33	Consolidating-Cognitive	33) I learn words using online tool's feedback	4	11.11		30	83.33
34	Consolidating-Cognitive	34) I learn through fun filled matching activities	6	16.67		28	77.78
35	Consolidating-Cognitive	35) Reinforce by playing a word game	4	11.11		29	80.56
36	Consolidating-Meta-cog	36) I use English-language media like Web sites, mobile phones content	26	72.22		35	97.22
37	Consolidating-Meta-cog	37) I test myself with word tests for reinforced learning	6	16.67		29	80.56
38	Consolidating-Meta-cog	38) I practice words over a gap in a day	0	0.00		11	30.56
39	Consolidating-Meta-cog	39) Try to use new words in speaking or writing	12	33.33		29	80.56
40	Consolidating-Meta-cog	40) I think myself if I am learning the new words effectively	11	30.56		26	72.22
41	Consolidating-Meta-cog	41) Use words in a sentence and share in an online group	3	8.33		16	44.44
42	Consolidating-Meta-cog	42) Learn words from peers in an online group	8	22.22		27	75.00

Based on the responses in the first questionnaire, the strategies used by the learners were analysed with their percentage of use and reported as the Vocabulary learning strategies practised by the participants before familiarizing themselves to some of the useful online vocabulary learning tools. Then the responses after the intervention in the second questionnaire were analysed with their percentage of use and reported as the e-Vocabulary learning strategies used while learning vocabulary with the help of the online learning tools. The strategies used before and after the intervention are compared and contrasted to identify the strategies that were evidently used while learning using the online learning tools, referring them as the e-Vocabulary learning strategies (e-VLS), to answer the first research question. The

reflections on the use of such strategies from the learners' reflective journals are reported to substantiate the findings from the questionnaires. The strategies found to be used are then presented in their respective categories.

The consolidated data in Table 4.1 was first used to understand the vocabulary learning strategies that were under practice before and after the intervention. Then the emphasis was laid on understanding the e-Vocabulary learning strategies that were under practice while learning with the help of online learning tools. Table 4.2 shows the vocabulary learning strategies that the learners used before the intervention.

Note: The data in Table 4.2 is concisely presented to fit it into one page and make it easy to access all the data in one place rather than stretching it onto multiple pages. Whereas, Table 4.1 was presented on multiple pages to present everything more legibly when presenting the data for the first time. If reading the content from Table 4.2 is difficult, zoom the it (in case of a soft copy) or verify it from Table 4.1 using the strategy number mentioned against each strategy.

As shown in Table 4.2, out of the 42 strategies just 6 strategies marked in green were found to be used by nearly 50% and above of the participants. The strategies include *"I use English-language media like Web sites, mobile phones content"* (72.22%), *"I guess meaning of a word from its context"* (72.22%), *"I look for meaning or the paraphrase of a word in an online dictionary"* (63.89%), *"I think of links between what I already know and the new word knowledge I gain"* (61.11%), *"I connect the word to its synonyms and antonyms"* (61.11%) and *"I paraphrase the word meaning on my own"* (47.22%) as shown in the table. Remaining 36 strategies

Table 4.2 Vocabulary learning strategies' use before intervention

Analysis of the Post-intervention e-Vocabulary learning strategies use			
Category of the Strategy	e-Vocabulary learning strategy	Pre-intervention Responses	
		Sum of the responses for 4 & 5	% of the responses for 4 & 5
Consolidating-Meta-cog	36) I use English-language media like Web sites, mobile phones content	26	72.22
Discovery- Determination	1) I guess meaning of a word from its context	26	72.22
Discovery- Determination	2) I look for meaning or the paraphrase of a word in an online dictionary	23	63.89
Consolidating-Memory	16) I think of links between what I already know and the new word knowledge I gain	22	61.11
Consolidating-Memory	20) I connect the word to its synonyms and antonyms	22	61.11
Consolidating-Cognitive	27) I paraphrase the word meaning on my own	17	47.22
Discovery- Determination	3) I find the words with similar meaning	13	36.11
Consolidating-Memory	19) I refer to more sentences using the word	13	36.11
Consolidating-Memory	17) I try to use new words in speaking or writing to remember well	12	33.33
Consolidating-Meta-cog	39) Try to use new words in speaking or writing	12	33.33
Consolidating-Memory	18) I study a word connecting it to a given pictorial representation	12	33.33
Consolidating-Cognitive	31) I use the English words learnt in different ways	12	33.33
Discovery-Social strategy	10) I ask facilitator for paraphrase or a similar word	12	33.33
Discovery-Social strategy	9) I ask other learner for paraphrase or a similar word	12	33.33
Consolidating-Cognitive	29) I listen to and practice the pronunciation of a word	11	30.56
Consolidating-Meta-cog	40) I think myself if I am learning the new words effectively	11	30.56
Discovery-Social strategy	11) I ask other learner for mother tongue translation	11	30.56
Discovery- Determination	7) I refer to sentence(s) with the new word	10	27.78
Discovery- Determination	8) I observe any pictures given in a text related to the words used	10	27.78
Consolidating-Cognitive	24) I study and practice spelling of a word	9	25.00
Discovery-Social strategy	13) I discuss the meaning of a word or sentence with another learner	9	25.00
Discovery- Determination	5) I look for related forms of the word noticing their prefixes or suffixes	9	25.00
Consolidating-Meta-cog	42) Learn words from peers in an online group	8	22.22
Consolidating-Cognitive	25) I say new word aloud when studying	8	22.22
Consolidating-Cognitive	30) I say or write new English words several times	8	22.22
Discovery-Social strategy	14) I discuss the meaning of a word or sentence with the facilitator	8	22.22
Discovery-Social strategy	12) I ask facilitator for mother tongue translation	8	22.22
Consolidating-Meta-cog	37) I test myself with word tests for reinforced learning	6	16.67
Consolidating-Cognitive	34) I learn through fun filled matching activities	6	16.67
Discovery- Determination	4) I find out the part of the speech of the given word	6	16.67
Consolidating-Cognitive	26) I remember other forms with suffix/prefix learnt	5	13.89
Consolidating-Cognitive	33) I learn words using online tool's feedback	4	11.11
Consolidating-Cognitive	35) Reinforce by playing a word game	4	11.11
Consolidating-Meta-cog	41) Use words in a sentence and share in an online group	3	8.33
Consolidating-Memory	23) I physically act out new English words	3	8.33
Consolidating-Memory	21) I use online Semantic maps (group/map of related words) to learn words	2	5.56
Consolidating-Memory	22) I use flashcards to remember new English words better	2	5.56
Consolidating-Social strate	15) I study and practice meaning in a group	2	5.56
Discovery- Determination	6) I use online flashcards to know the meaning using the definition or a picture given	1	2.78
Consolidating-Cognitive	32) I visualize the flash cards to recall words learnt	1	2.78
Consolidating-Meta-cog	38) I practice words over a gap in a day	0	0.00
Consolidating-Cognitive	28) I maintain a vocabulary notebook	0	0.00

were found to be used by lesser than 50% of the participants. Moving down the table after the sixth strategy, "*I paraphrase the word meaning on my own*", few strategies were used by less than 40% and few others by less than 30% of the participants. At the bottom of the table, we can find strategies that were not used by any of the participants (0.00%).

Table 4.3 shows the e-Vocabulary learning strategies that were reported to be in use by the learners while learning vocabulary using the online learning tools. The post intervention data analysis shows that out of the 42 strategies in the inventory, 34 strategies marked in green were reported to be used by nearly 50% and above of the participants. The six strategies that showed frequent use before the intervention as seen in Table 4.2 continued to be frequently used while learning with the help of the online learning tools too. Additionally, the participants brought 28 other strategies into their extensive practice during the intervention making it a total of 34 e-VLS under use. Remaining 8 strategies were comparatively less used. Yet, they too were used better when compared to their pre-intervention usage. Of those 8, 3 strategies were used by 44.44% of the participants. Last 5 strategies were used comparatively less, by 38.89% to 16.67% of the participants.

Table 4.3 Post intervention e-Vocabulary learning strategies use

Analysis of the Post-intervention e-Vocabulary learning strategies use				
			Post-intervention Response s	
Category of the Strategy	e-Vocabulary learning strategy		Sum of the responses for 4 & 5	% of the responses for 4 & 5
Consolidating-Meta-cog	36) I use English-language media like Web sites, mobile phones content		35	97.22
Discovery- Determination	1) I guess meaning of a word from its context		34	94.44
Discovery- Determination	2) I look for meaning or the paraphrase of a word in an online dictionary		33	91.67
Discovery- Determination	7) I refer to sentence(s) with the new word		33	91.67
Consolidating-Cognitive	29) I listen to and practice the pronunciation of a word		32	88.89
Discovery- Determination	3) I find the words with similar meaning		31	86.11
Consolidating-Memory	19) I refer to more sentences using the word		31	86.11
Consolidating-Memory	16) I think of links between what I already know and the new word knowledge I gain		30	83.33
Consolidating-Memory	20) I connect the word to its synonyms and antonyms		30	83.33
Consolidating-Cognitive	33) I learn words using online tool's feedback		30	83.33
Consolidating-Memory	17) I try to use new words in speaking or writing to remember well		29	80.56
Consolidating-Meta-cog	39) Try to use new words in speaking or writing		29	80.56
Discovery- Determination	8) I observe any pictures given in a text related to the words used		29	80.56
Consolidating-Meta-cog	37) I test myself with word tests for reinforced learning		29	80.56
Consolidating-Cognitive	35) Reinforce by playing a word game		29	80.56
Consolidating-Cognitive	34) I learn through fun filled matching activities		28	77.78
Consolidating-Memory	21) I use online Semantic maps (group/map of related words) to learn words		28	77.78
Consolidating-Cognitive	27) I paraphrase the word meaning on my own		27	75.00
Consolidating-Memory	18) I study a word connecting it to a given pictorial representation		27	75.00
Consolidating-Meta-cog	42) Learn words from peers in an online group		27	75.00
Discovery- Determination	6) I use online flashcards to know the meaning using the definition or a picture given		27	75.00
Consolidating-Cognitive	32) I visualize the flash cards to recall words learnt		27	75.00
Consolidating-Cognitive	31) I use the English words learnt in different ways		26	72.22
Consolidating-Meta-cog	40) I think myself if I am learning the new words effectively		26	72.22
Consolidating-Memory	22) I use flashcards to remember new English words better		26	72.22
Consolidating-Cognitive	24) I study and practice spelling of a word		25	69.44
Consolidating-Social strate	15) I study and practice meaning in a group		25	69.44
Discovery- Determination	4) I find out the part of the speech of the given word		23	63.89
Discovery-Social strategy	13) I discuss the meaning of a word or sentence with another learner		20	55.56
Consolidating-Cognitive	25) I say new word aloud when studying		20	55.56
Discovery- Determination	5) I look for related forms of the word noticing their prefixes or suffixes		18	50.00
Discovery-Social strategy	10) I ask facilitator for paraphrase or a similar word		17	47.22
Consolidating-Cognitive	30) I say or write new English words several times		17	47.22
Consolidating-Cognitive	26) I remember other forms with suffix/prefix learnt		17	47.22
Discovery-Social strategy	9) I ask other learner for paraphrase or a similar word		16	44.44
Discovery-Social strategy	14) I discuss the meaning of a word or sentence with the facilitator		16	44.44
Consolidating-Meta-cog	41) Use words in a sentence and share in an online group		16	44.44
Consolidating-Memory	23) I physically act out new English words		14	38.89
Consolidating-Meta-cog	38) I practice words over a gap in a day		11	30.56
Discovery-Social strategy	12) I ask facilitator for mother tongue translation		8	22.22
Consolidating-Cognitive	28) I maintain a vocabulary notebook		7	19.44
Discovery-Social strategy	11) I ask other learner for mother tongue translation		6	16.67

Chart 4.1 displays a comparative view of the percentage of strategies used before and after the intervention with consolidated data from tables 4.2 and 4.3. As indicated in Chart 4.1 with blue bars, there was no strategy unused by participants post-intervention compared to the pre-intervention use. Moreover, there was a rise in the use of strategies while learning with online tools. While most strategies were found with a significant rise in the percentage of their use, few were found with a considerable rise. The percentage of rise ranged from 72.22% to 11.11% among the 42 strategies. Chart 4.1 shows this noticeable difference in descending order (The chart might appear unorganized at first sight at the numbers there, but the order would be visible when looking through the difference between the pre-intervention and post-intervention percentages for each strategy). To make it further clear, Chart 4.2 was drafted to explicitly visualize the difference.

The purpose of Chart 4.1 was to visualize the effective use of the strategies post-intervention. In other terms, it shows the difference between using the strategies as VLS vs. using them as e-VLS. All the strategies, except two, were found with a rise in percentage of their use. The first among the two exceptions was, *“I ask other learner for mother tongue translation”* (strategy# 11) which showed a drop in the percentage of the participants using it from 30.56% to 16.67%. The second strategy was *“I ask facilitator for mother tongue translation”* (strategy# 12) which remained static with 22.22% of the participants using it before and after the intervention. Other than these two strategies, every other strategy was found to be used with a definite increase in their use as shown in the charts. While Chart 4.1 gives a comparative view of the strategies used before and after the intervention, Chart 4.2 helps to visualize only the difference between both. It exclusively displays the difference observed in the use of each strategy before and after the intervention.

Chart 4.1 Rise in the strategies use after the intervention with online learning tools

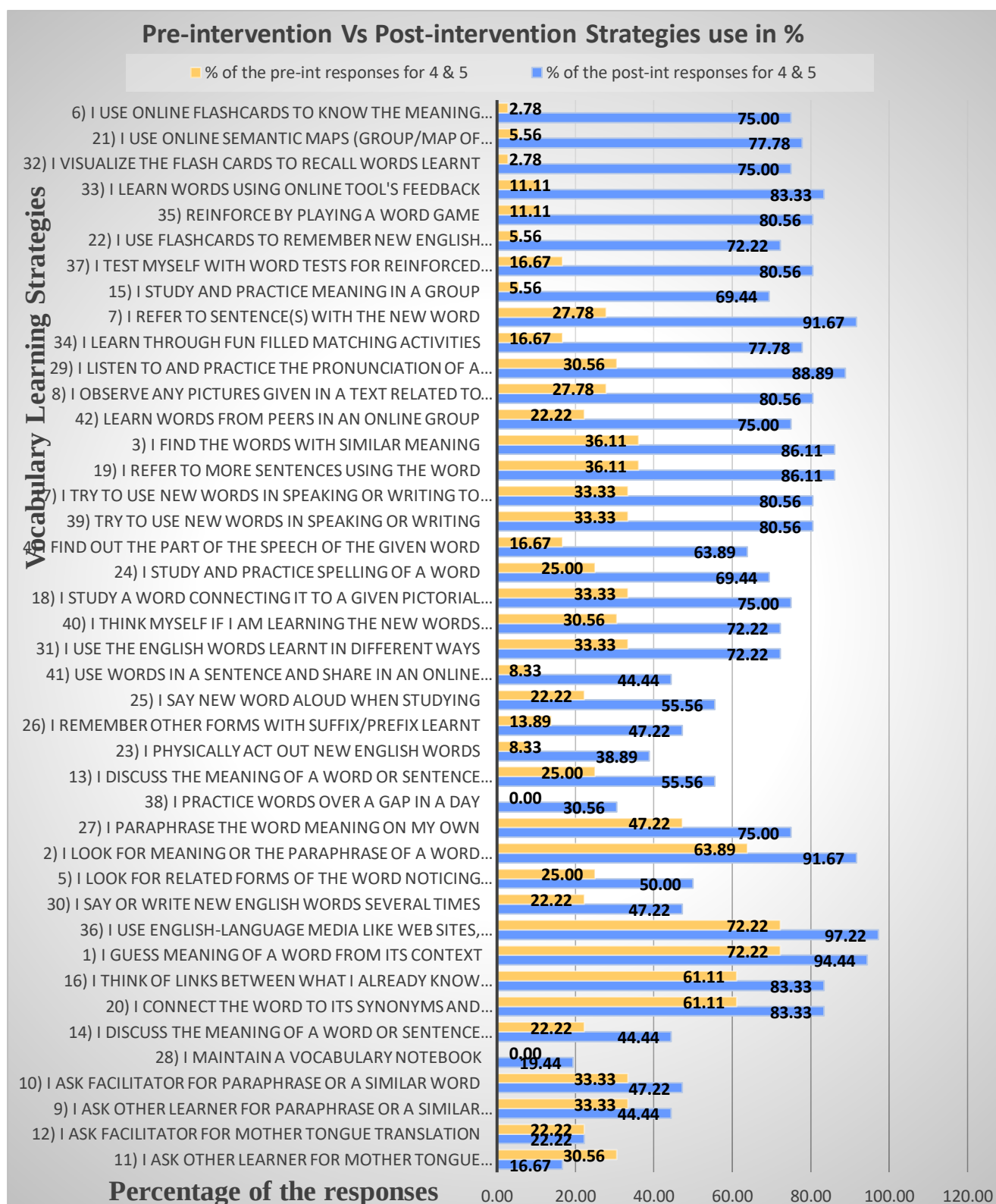
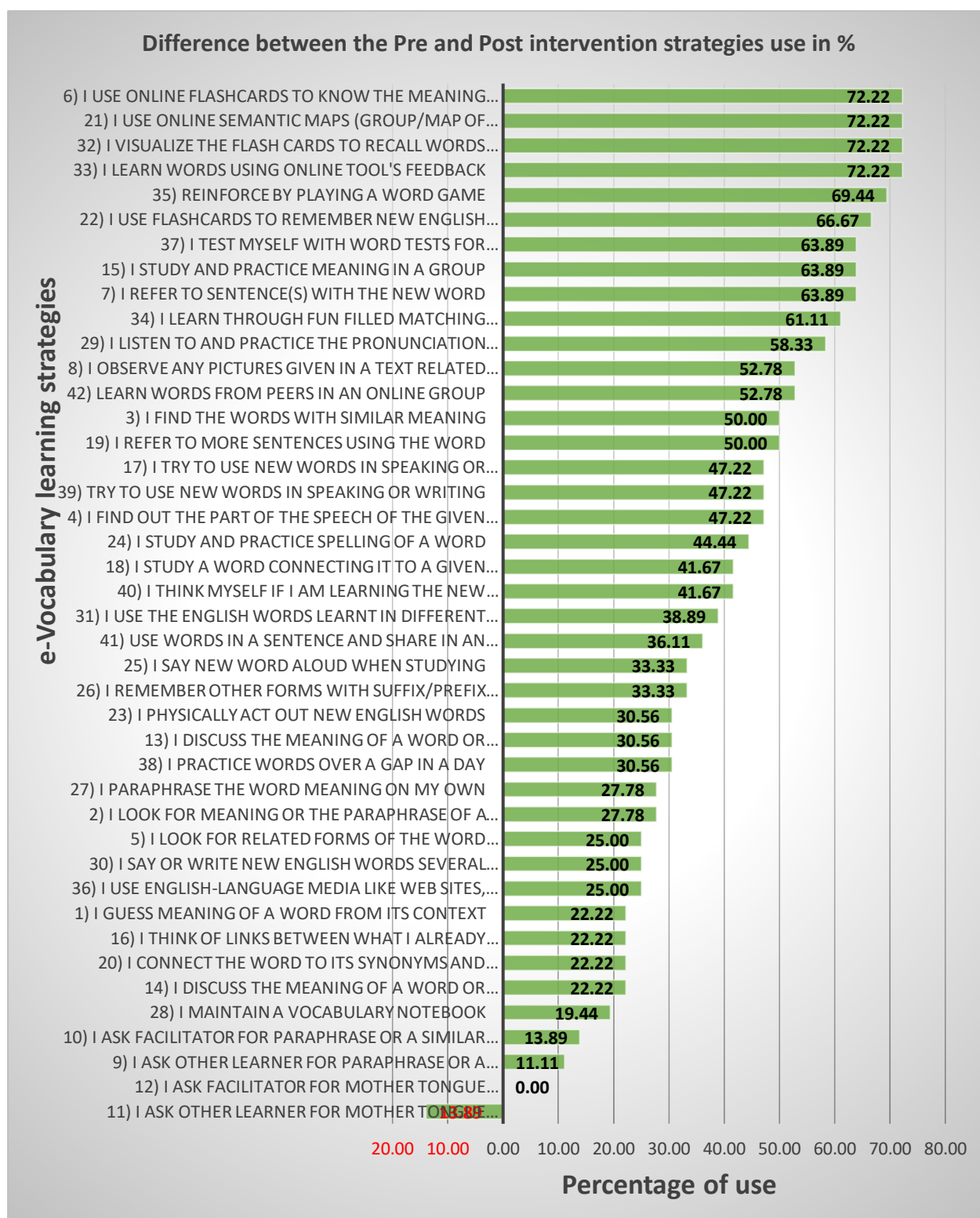


Chart 4.2 Difference in the pre and post intervention use of the strategies in %



To understand the strategies used further from their categories point of view, the six strategies used before the intervention as shown in Table 4.2 are of the

following categories: Consolidating-Meta-cognitive strategy, Discovery-Determination strategies, Consolidating-Memory strategy, and consolidating cognitive strategy. The 34 e-VLS found to be used post-intervention (from Table 4.3) show that all the six categories of the strategies were used by the participants. Of the remaining 8 strategies that were used less, it was found that 4 were from a common category, Discovery-Social strategies (strategy# 9, 14, 12 and 11 in their order in the table). One of the remaining was from the category, Consolidating-Cognitive strategies (strategy# 28). The next one was from the category, Consolidating-Memory strategies (strategy# 23). Last two strategies were of the category, Consolidating-Meta cognitive strategies (strategy# 38 and 41). The findings of the post-intervention responses resonated with the learners' reflections on the use of the strategies.

4.2 Research Question 2

What are the most and the least frequently used e-vocabulary learning strategies while learning with online learning tools?

While the first research question emphasizes on exploring what are all the e-VLS that are practiced by the learners when they use certain online tools for learning, the second research question emphasizes on finding out learners' priorities within those strategies. Their priorities are understood by the frequency with which each strategy is used. The mean of all the 36 responses given to each strategy in the post-intervention questionnaire implies the frequency of the pertinent strategy. In order to answer the research question 2, calculating and comparing the frequencies of all the 42 strategies helped in categorizing them from most frequently used e-VLS to the least frequently used ones. When the means for all the strategies were calculated and

sorted in their descending order, their means ranged from 4.86 to 2.47 as displayed in Table 4.4. The standard deviation for the means was between 0.42 and 1.11 implying the uniformity of the responses to the strategies. The median for the means is found to be 3.90.

4.2.1. The most frequently used e-VLS

The strategies with the mean of 3.90 and above are observed as the most frequently used e-VLS. There were 21 such strategies with their mean ranging from 4.86 to 3.92 as shown in Table 4.4, marked in thick green. The first 10 most used strategies to name with their respective means are as follows. (Strategy# 36) *“I use English-language media like Web sites, mobile phones content”* (4.86), (Strategy# 2) *“I look for meaning or the paraphrase of a word in an online dictionary”* (4.56), (Strategy# 1) *“I guess meaning of a word from its context”* (4.36), (Strategy# 7) *“I refer to sentence(s) with the new word”* (4.28), (Strategy# 3) *“I find the words with similar meaning”* (4.25), (Strategy# 16) *“I think of links between what I already know and the new word knowledge I gain”* (4.22), (Strategy# 29) *“I listen to and practice the pronunciation of a word”* (4.17), (Strategy# 19) *“I refer to more sentences using the word”* (4.17), (Strategy# 21) *“I use online Semantic maps (group/map of related words) to learn words”* (4.11) and (Strategy# 27) *“I paraphrase the word meaning on my own”* (4.06).

In addition to these 10, there are 11 more strategies with the mean above 3.90 moving down the order, as seen in the Table 4.4, making it a total of 21 strategies. To understand the 21 most used strategies in their respective category point of view, 6 were Consolidating-Memory strategies (Strategy# in the order of their frequency: 16,

Table 4.4 Frequencies of the e-VLS used

Analysis of the frequency of e-VLS use				
Category of the Strategy	e-Vocabulary learning strategy		Post-Int Mean	Std.Dev
Consolidating-Meta-cog	36) I use English-language media like Web sites, mobile phones content		4.86	0.42
Discovery-Determination	2) I look for meaning or the paraphrase of a word in an online dictionary		4.56	0.73
Discovery-Determination	1) I guess meaning of a word from its context		4.36	0.59
Discovery-Determination	7) I refer to sentence(s) with the new word		4.28	0.81
Discovery-Determination	3) I find the words with similar meaning		4.25	0.69
Consolidating-Memory	16) I think of links between what I already know and the new word know		4.22	0.72
Consolidating-Cognitive	29) I listen to and practice the pronunciation of a word		4.17	0.61
Consolidating-Memory	19) I refer to more sentences using the word		4.17	0.74
Consolidating-Memory	21) I use online Semantic maps (group/map of related words) to learn w		4.11	0.82
Consolidating-Cognitive	27) I paraphrase the word meaning on my own		4.06	0.89
Consolidating-Memory	17) I try to use new words in speaking or writing to remember well		4.03	0.65
Discovery-Determination	8) I observe any pictures given in a text related to the words used		4.03	0.74
Consolidating-Memory	20) I connect the word to its synonyms and antonyms		4.03	0.88
Consolidating-Cognitive	34) I learn through fun filled matching activities		4.03	0.91
Consolidating-Meta-cog	39) Try to use new words in speaking or writing		4.00	0.63
Consolidating-Cognitive	33) I learn words using online tool's feedback		4.00	0.76
Consolidating-Meta-cog	37) I test myself with word tests for reinforced learning		3.94	0.75
Consolidating-Meta-cog	40) I think myself if I am learning the new words effectively		3.94	0.79
Consolidating-Cognitive	35) Reinforce by playing a word game		3.94	0.92
Consolidating-Memory	18) I study a word connecting it to a given pictorial representation		3.92	0.73
Consolidating-Cognitive	24) I study and practice spelling of a word		3.92	0.87
Consolidating-Meta-cog	42) Learn words from peers in an online group		3.89	0.78
Consolidating-Cognitive	31) I use the English words learnt in different ways		3.86	0.83
Discovery-Determination	6) I use online flashcards to know the meaning using the definition or a		3.81	0.86
Consolidating-Memory	22) I use flashcards to remember new English words better		3.78	0.87
Consolidating-Cognitive	32) I visualize the flash cards to recall words learnt		3.78	0.99
Discovery-Determination	4) I find out the part of the speech of the given word		3.75	0.81
Discovery-Social strateg	13) I discuss the meaning of a word or sentence with another learner		3.58	0.81
Discovery-Determination	5) I look for related forms of the word noticing their prefixes or suffixes		3.58	0.87
Consolidating-Cognitive	25) I say new word aloud when studying		3.58	1.02
Consolidating-Social strateg	15) I study and practice meaning in a group		3.56	1.00
Consolidating-Cognitive	26) I remember other forms with suffix/prefix learnt		3.47	0.77
Consolidating-Meta-cog	41) Use words in a sentence and share in an online group		3.39	0.87
Discovery-Social strateg	14) I discuss the meaning of a word or sentence with the facilitator		3.36	0.99
Consolidating-Cognitive	30) I say or write new English words several times		3.36	1.02
Discovery-Social strateg	10) I ask facilitator for paraphrase or a similar word		3.33	0.86
Discovery-Social strateg	9) I ask other learner for paraphrase or a similar word		3.28	0.94
Consolidating-Memory	23) I physically act out new English words		3.17	1.00
Consolidating-Meta-cog	38) I practice words over a gap in a day		3.08	0.94
Discovery-Social strateg	11) I ask other learner for mother tongue translation		2.78	0.90
Discovery-Social strateg	12) I ask facilitator for mother tongue translation		2.67	1.04
Consolidating-Cognitive	28) I maintain a vocabulary notebook		2.47	1.11

19, 21, 17, 20 and 18), 6 were Consolidating-Cognitive strategies (Strategy# in the order of their frequency: 29, 27, 34, 33, 35 and 24), 5 were Discovery-Determination strategies (Strategy# in the order of their frequency: 2, 1, 7, 3 and 8) and 4 were Consolidating-Meta cognitive strategies (Strategy# in the order of their frequency: 36, 39, 37 and 40).

4.2.2 The less frequently used e-VLS

Instead of categorizing the strategies just into two categories; most and the least used ones, the strategies were appropriately categorized into three categories; the most frequently used, the less frequently used and the least frequently used strategies as done in the earlier studies in the field (e.g., Ravi Sheorey, 1999). They were categorized into three categories as there were few moderately used strategies with a mean ranging from 3.90 to 3.50, which is still a positive range out of 5 (Oxford and Burry-Stock, 1995). Such moderately used strategies were referred to as less used e-VLS. There were 10 strategies with a mean ranging from 3.89 to 3.56 as shown in the Table 4.4, marked in light green which are categorized as the less frequently used e-VLS. The percentage of the participants using them (as discussed under the earlier research question) also ranged moderately from 75% to 50%. Of the 10 strategies, 3 were the Determination strategies useful in discovering the word knowledge (strategy# 6, 4 and 5), 3 were Consolidating-Cognitive strategies (strategy# 31, 32 and 25), 1 was a social strategy useful in discovering the word knowledge (strategy# 13), 1 was a Social strategy useful in consolidating the word knowledge (strategy#15), 1 was a Consolidating-Memory strategy (strategy# 22) and the last 1 was a Consolidating-Meta cognitive strategy (strategy# 42). Rest of the strategies moving down the list were found with the decreasing mean which are categorized under the following section as the least used ones.

4.2.3 The least frequently used e-VLS

There were 11 strategies with the least mean ranging from 3.47 to 2.47 as shown in Table 4.4, marked in red. They were categorized as the least frequently used

e-VLS among the 42 strategies in the inventory used. Of the 11 strategies, there were 5 Social strategies useful in discovering the word knowledge (strategy # 14, 10, 9, 11 and 12 in their order in the table), 3 cognitive strategies useful in consolidating the word knowledge (strategy # 26, 30 and 28 in their order in the table), 2 meta-cognitive strategies useful in consolidating the word knowledge (strategy # 41 and 38) and 1 memory strategy useful in consolidating the word knowledge (strategy # 23).

The above findings on the most and least frequently used e-VLS were found evident in the individual reflective journals. A consolidated view of the reflections shared in different reflective journals are comparable to the most and the least used e-VLS.

4.2.4 Analysis of the number of strategies used under each category

Three tables above have listed the e-VLS that were used most, less and least frequently by the learners. Table 4.5 concisely presents the strategies used by their categories (Determination, Social, Memory, Cognitive and Meta-cognitive), used either to discover or to consolidate the word knowledge. As shown in the table, the categories are mapped with the frequencies of the strategies used. As the numbers show, the ‘Memory strategies’ and the ‘Cognitive strategies’ useful in consolidating the word knowledge were the most used categories followed by the ‘Determination strategies’ for discovering the word knowledge and then the ‘Meta-cognitive strategies’ useful in consolidating the word knowledge. There was no social strategy found under the most frequently used e-VLS column. 5 among the total 7 social strategies in the inventory were found under the ‘Least frequently used e-VLS’ column.

Table 4.5 Details of the categories of e-VLS with their frequency of use

Category wise analysis of the number of strategies used					
		Most frequently used e-VLS	Less frequently used e-VLS	Least frequently used e-VLS	Total
Discovery Strategies	Determination strategy	5	3	0	8
	Social strategy	0	1	5	6
Consolidating Strategies	Social strategy	0	1	0	1
	Memory strategy	6	1	1	8
	Cognitive strategy	6	3	3	12
	Meta-cog strategy	4	1	2	7
					42

The details of the categories mentioned in Table 4.5 are presented in their percentages in Table 4.6. The percentages were calculated within each category. They were calculated for each category rather than calculating for all the categories in the inventory together. It was done so because the number of strategies under each category in the inventory was not equal and calculating a percentage together would not give a better inference. For instance, as shown in Table 4.5, the most frequently used memory and cognitive strategies appear to be equally 6. But the most used 6 memory strategies are out of the total 8 memory strategies in the inventory whereas the 6 cognitive strategies are out of the total 12 cognitive strategies in the inventory. Calculating a percentage for all the categories together may imply both to be passed off equally as the most used categories but in reality, they are not the same.

Table 4.6 Details of the categories of the e-VLS and their frequency of use in %

Category wise analysis of % of the strategies used					
		Most frequently used e-VLS in %	Less frequently used e-VLS in %	Least frequently used e-VLS in %	Total
Discovery Strategies	Determination strategy	62.50 %	37.50 %	0 %	100%
	Social strategy	0 %	16.67 %	83.33 %	100%
Consolidating Strategies	Social strategy	0 %	100 %	0 %	100%
	Memory strategy	75 %	12.5 %	12.5 %	100%
	Cognitive strategy	50 %	25 %	25 %	100%
	Meta-cog strategy	57.14 %	14.28 %	28.57 %	100%

Under the ‘Most frequently used e-VLS’ column, except the ‘Social strategies’ category, all the other categories were in higher percentages of use. To understand them under each category, 62.50% of Determination strategies, 75% of Memory strategies, 50% of the Cognitive strategies and 57.14% of the Meta-cognitive strategies were found to be most commonly used strategies. 83.33% of the ‘Social strategies’ useful in discovering the word knowledge were found under the last column, ‘Least frequently used e-VLS in %’. The only social strategy useful in consolidating the word knowledge in the inventory, “*I study and practice meaning in a group*”, shows its use as 100% under the ‘Less frequently used e-VLS’ column.

There was no ‘Determination strategy’ that was least frequently used. 12.5% of the Memory strategies were found under both less frequently and least frequently used e-VLS. Similarly, 25% of the Cognitive strategies were under the less frequently used and the least frequently used strategies. 14.28% and 28.57% of the Meta-

cognitive strategies were under less and least frequently used ones respectively as shown in the table.

4.3 Research question 3

What are the differences between high and low proficiency learners in using e-vocabulary learning strategies while learning with online learning tools?

The third research question of the study directs to explore if there are any differences in use of the e-VLS among the learners of high and low proficiency learners while learning with the online learning tools. The learner sample participating in the study was heterogeneous in language proficiency. It had high proficiency learners who were referred to as “Advanced learners” and low proficiency learners referred to as “Intermediate” and “Pre-intermediate” learners by the host institution. Such groups of varied proficiency were formed by the institution purposefully to encourage peer interactions and collaborative learning. A diagnostic test is used to assess learners’ proficiency and segregate them into different proficiency groups. At the beginning of their course, they were given the diagnostic LSRW test by the institution which tests the four language skills in equal proportions similar to a mock standardized test to assess their language proficiency. Then the learners were categorized as high proficiency or low proficiency learners. The high proficiency learners were denoted with “A” implying “Advanced” learners and the low proficiency learners were denoted with “I” indicating “Intermediate” and “Pre-intermediate” learners by the institution. The same conventions, “A” and “I” are used to present the results in the current study in

reference to the “Advanced” and “Intermediate” learners present in the sample of the study. Of the 36 participants, 19 learners were of the “A” group and 17 were of the “I” group.

In order to present the differences among the two groups in the use of e-VLS and to refer to the strategies easily while presenting the results, the strategies have been coded as shown in the second column of Table 4.7 to derive their abbreviations. The first letter of all the codes is either D or C indicating Discovery or Consolidating type of the strategies respectively. The last letter is commonly “S” for all implying the word ‘Strategy’. The letter/s in between the first and the last ones indicate/s the category of the strategy i.e. D for Determination, S for Social, M for Memory, C for Cognitive, and MC for Meta-cognitive categories. The code is suffixed with a number to indicate the order of a strategy within a given category. For instance, DDS1 indicates Discovery- Determination Strategy-1 (I guess meaning of a word from its context) followed by DDS2, Discovery- Determination Strategy-2 (I look for meaning or the paraphrase of a word in an online dictionary) etc.

The analysis carried out by comparing and contrasting the percentage of the “A” and “I” group participants in their strategy use showed that there were many strategies that were found to be similarly used by both the groups. However, there were also differences in the use of the strategies. Some strategies were used with a slight difference and some other strategies with a high difference. Before moving on to the differences, some of the strategies that were similarly used well by the “A” and “I” learner groups were DDS2, DDS7, CMS1, CMS4, CMCS1, CMS5 etc. And the differences observed in the use of the strategies are as mentioned under the four sections below.

4.3.1. The most used e-VLS of the “A” group and the “I” group learners differed from each other and their least used e-VLS were found to be almost similar.

When the five most used e-VLS and the five least used e-VLS of the “A” group learners were compared with that of the “I” group learners, they differed considerably in the most used e-VLS and appeared to be similar in their least used e-VLS. As could be seen in Table 4.7 through their codes, the top five e-VLS used by the high proficiency learner group were DDS1, DDS2, DDS7, CMCS1 and CCS4, whereas that of the low proficiency learner group were CCS6, CMCS1, DDS3, DDS6 and CCS10. The only common strategy among both learner groups was CMCS1 with 100% and 94.74% of the high and low proficiency learners using it respectively. Other than CMCS1, all the other four strategies differed in their use. CCS4, one among the remaining four best used e-VLS, was used by 89.47% of the “A” group learners but just by 58.82% of the “I” group learners.

DDS1 was the top most used strategy among the “A” group with 100% of the learners using it but it was reported as the seventh strategy in the list of the low proficiency learners with 88.24% of them using it. Similarly DDS2 and DDS7 were the next top used strategies by the “A” group whereas they were at 8th and 9th positions in the list of “I” group strategies. Though they were considerably used by both the groups, there were differences found in the order of their priorities.

When the least used e-VLS among both the groups were compared, there were similarities found. The five least used e-VLS of the “A” group were

DSS2, CMCS3, CCS5, DSS3 and DSS4 with 31.58%, 31.58, 15.79%, 10.53% and 5.26% of the participants using them respectively as seen in the table 4.7. Out of the five, four e-VLS were found to be similarly less used by the “I” group learners too. They were CMCS3, CCS5, DSS3 and DSS4 with 29.41%, 23.53%, 23.53% and 41.18% of the learners using the strategies respectively. DSS2 was the only strategy that differed among the two groups in its use as it was not among the least used strategies list of the “I” group. It was used by just 31.58 % of the “A” group learners whereas it was used by a considerable 64.71% of the “I” group learners.

4.3.2 The differences in the use of e-VLS in reference to the depth of word knowledge

When the e-VLS used by the high and low proficiency learners were closely observed, there were considerable differences in use of certain strategies. The low proficiency learners were found to use some of the e-VLS of peripheral word knowledge more as presented in Table 4.7. For instance, the strategies CCS6, CCS1, DDS3, DDS6 and DDS8 used more by them are of form and meaning level. Further, strategies CMS2 and CMS7 used by them are memory strategies. In contrary, the strategies used by high proficiency learners such as CMCS5, CCS4 and DDS1 were found to be cognitive and meta-cognitive strategies. Their priority for using the strategy DDS5 imply that they attempt to draw additional word knowledge by using affixation. Overall, the e-VLS used by the 'I' group learners imply that they were primarily looking for the peripheral word knowledge whereas that of the 'A' group learners were looking for deeper word knowledge.

Table 4.7 Use of e-VLS by the “A” and “I” group participants

S.No	e-VLS Code	Category of the Strategy	eVocabulary learning strategy	"A" responses for 4 & 5 in %	"I" responses for 4 & 5 in %
1	DDS1	Discovery- Determination	1) I guess meaning of a word from its context	100.00	88.24
2	DDS2	Discovery- Determination	2) I look for meaning or the paraphrase of a word in an online dictionary	94.74	88.24
3	DDS3	Discovery- Determination	3) I find the words with similar meaning	78.95	94.12
4	DDS4	Discovery- Determination	4) I find out the part of the speech of the given word	63.16	64.71
5	DDS5	Discovery- Determination	5) I look for related forms of the word noticing their prefixes or suffixes	63.16	35.29
6	DDS6	Discovery- Determination	6) I use online flashcards to know the meaning using the definition or a picture	73.68	94.12
7	DDS7	Discovery- Determination	7) I refer to sentence(s) with the new word	94.74	88.24
8	DDS8	Discovery- Determination	8) I observe any pictures given in a text related to the words used	73.68	88.24
9	DSS1	Discovery-Social strategy	9) I ask other learner for paraphrase or a similar word	36.84	52.94
10	DSS2	Discovery-Social strategy	10) I ask facilitator for paraphrase or a similar word	31.58	64.71
11	DSS3	Discovery-Social strategy	11) I ask other learner for mother tongue translation	10.53	23.53
12	DSS4	Discovery-Social strategy	12) I ask facilitator for mother tongue translation	5.26	41.18
13	DSS5	Discovery-Social strategy	13) I discuss the meaning of a word or sentence with another learner	52.63	58.82
14	DSS6	Discovery-Social strategy	14) I discuss the meaning of a word or sentence with the facilitator	36.84	52.94
15	CSS1	Consolidating-Social strategy	15) I study and practice meaning in a group	57.89	82.35
16	CMS1	Consolidating-Memory	16) I think of links between what I already know and the new word know	84.21	82.35
17	CMS2	Consolidating-Memory	17) I try to use new words in speaking or writing to remember well	73.68	88.24
18	CMS3	Consolidating-Memory	18) I study a word connecting it to a given pictorial representation	68.42	82.35
19	CMS4	Consolidating-Memory	19) I refer to more sentences using the word	84.21	88.24
20	CMS5	Consolidating-Memory	20) I connect the word to its synonyms and antonyms	78.95	88.24
21	CMS6	Consolidating-Memory	21) I use online Semantic maps (group/map of related words) to learn words	68.42	88.24
22	CMS7	Consolidating-Memory	22) I use flashcards to remember new English words better	63.16	82.35
23	CMS8	Consolidating-Memory	23) I physically act out new English words	47.37	29.41
24	CCS1	Consolidating-Cognitive	24) I study and practice spelling of a word	52.63	88.24
25	CCS2	Consolidating-Cognitive	25) I say new word aloud when studying	52.63	58.82
26	CCS3	Consolidating-Cognitive	26) I remember other forms with suffix/prefix learnt	47.37	47.06
27	CCS4	Consolidating-Cognitive	27) I paraphrase the word meaning on my own	89.47	58.82
28	CCS5	Consolidating-Cognitive	28) I maintain a vocabulary notebook	15.79	23.53
29	CCS6	Consolidating-Cognitive	29) I listen to and practice the pronunciation of a word	78.95	100.00
30	CCS7	Consolidating-Cognitive	30) I say or write new English words several times	42.11	52.94
31	CCS8	Consolidating-Cognitive	31) I use the English words learnt in different ways	63.16	82.35
32	CCS9	Consolidating-Cognitive	32) I visualize the flash cards to recall words learnt	63.16	88.24
33	CCS10	Consolidating-Cognitive	33) I learn words using online tool's feedback	73.68	94.12
34	CCS11	Consolidating-Cognitive	34) I learn through fun filled matching activities	68.42	88.24
35	CCS12	Consolidating-Cognitive	35) Reinforce by playing a word game	73.68	88.24
36	CMCS1	Consolidating-Meta-cog	36) I use English-language media like Web sites, mobile phones content	94.74	100.00
37	CMCS2	Consolidating-Meta-cog	37) I test myself with word tests for reinforced learning	68.42	94.12
38	CMCS3	Consolidating-Meta-cog	38) I practice words over a gap in a day	31.58	29.41
39	CMCS4	Consolidating-Meta-cog	39) Try to use new words in speaking or writing	73.68	88.24
40	CMCS5	Consolidating-Meta-cog	40) I think myself if I am learning the new words effectively	78.95	64.71
41	CMCS6	Consolidating-Meta-cog	41) Use words in a sentence and share in an online group	57.89	29.41
42	CMCS7	Consolidating-Meta-cog	42) Learn words from peers in an online group	68.42	82.35

4.3.3 The “A” and “I” group learners differed in using e-VLS that promote self-directed learning (learner autonomy):

When the e-VLS used by the high and low proficiency learners were closely observed, the ones used by the “A” group learners and the categories of respective strategies indicated a higher level of self-management among the learners while learning. Three of the five most used e-VLS (DDS1, DDS2 and DDS7) by the “A” group learners belong to the ‘Discovery-Determination’ category. It implies their thrust for discovering word knowledge by their self-inquiry rather than resourcing into others’ expertise. These e-VLS were comparatively used less by the low proficiency learners. Further, “A” group learners were found to extensively use the e-VLS CMCS6 which demands the learners to be proactive and initiate collaboration. In converse, the “I” group learners were found to use the e-VLS CMCS7 more which leaves a scope to be passive by not contributing to peers but to learn from others through collaboration. Further, the extensive use of e-VLS such as CCS4 and CMCS5 by the high proficiency learners which demand paraphrasing and self-evaluation skills imply that they practiced self-directed learning more.

4.3.4 The e-VLS that scaffold while learning with the online tools were used more by the “I” group learners:

The e-VLS that help in drawing scaffolding offered by the tools were observed to be used more by the low proficiency learners while learning using the online tools. Some of such observations are as follows:

- i. The e-VLS DDS6, CMS7 and CCS9 that help in knowing, remembering and recalling facilitated by flashcards on Quizlet tool were used more by the “I” group learners.
- ii. The e-VLS DDS8 and CMS3 that help the learners with practicing imagery while learning vocabulary were used more by the “I” group learners.
- iii. The e-VLS CCS6 that facilitates pronunciation on the online tools was more used by the “I” group learners.
- iv. The e-VLS CCS11 and CCS12 that facilitate fun filled learning were found to be used more by the “I” group learners.
- v. The e-VLS CMS6 that aid memory with Semantic mapping strategy was used more by the “I” group learners.
- vi. The e-VLS of self-testing and feedback were used more by the “I” group learners.

4.4 Research question 4

What are the perceptions of the learners on learning vocabulary online and on the use of online tools?

There were two objectives for the fourth research question in the study. First, to find out how the participants have perceived learning vocabulary using the online learning tools. Second, to find out how they perceived the very idea of using the online tools for learning words. Both views appear to be intersecting but they vary in the emphasis laid. First view laid the emphasis on the learning of vocabulary whereas the second one specifically on the use of the online tools. Learners’ reflective journals, researcher’s field notes and the interview responses of the learners were

analysed to answer the research question. Thematic analysis was used to analyse the data. The commonalities among the views of the participants have helped to figure out some codes. From the codes that emerged, the closely related ones were categorized into certain themes as presented in the following sections. They are presented after an overview on the software tool used to analyse the data.

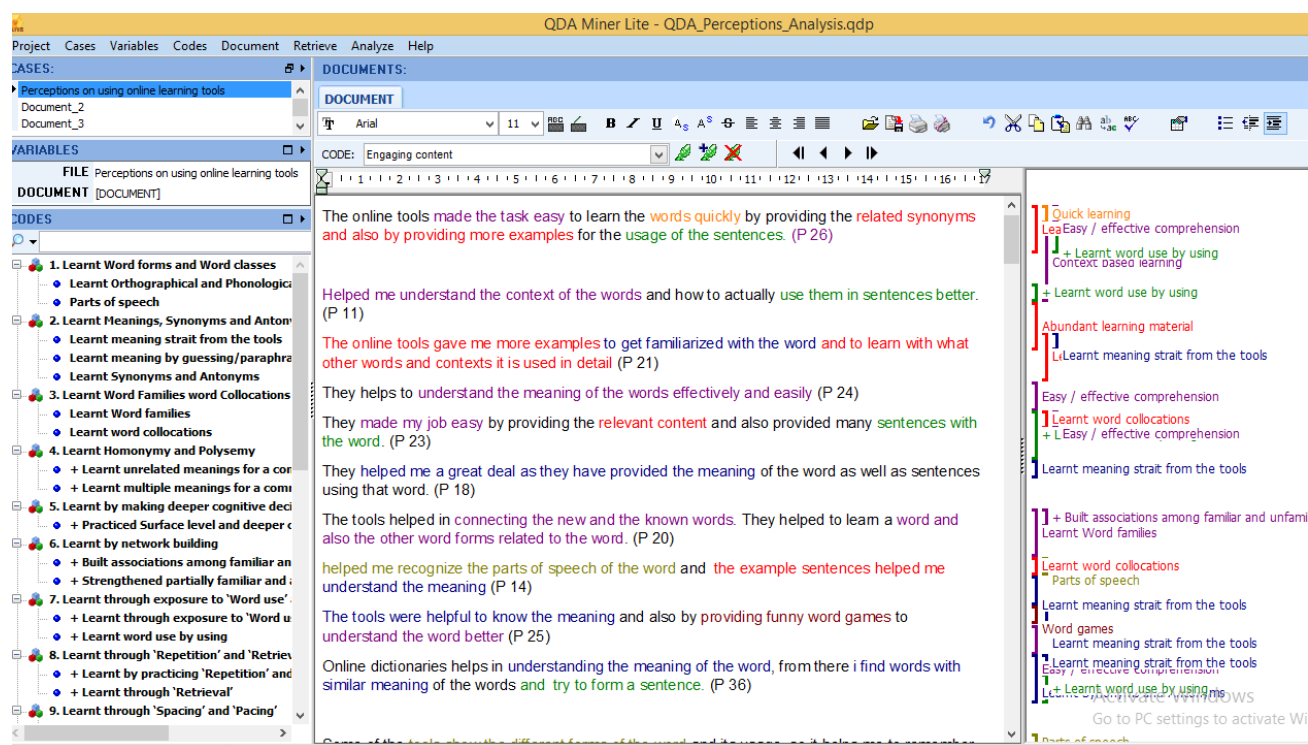
4.4.1 Thematic analysis software tool used

The qualitative data analysis was carried out using the thematic analysis software tool, 'QDA miner lite'. It is an open-source data analysis tool available online. It is useful in coding the qualitative data, annotating and analysing the documents. While the primary version 'QDA miner' is a multi-dimensional tool, the lite version (as it reads in its name) is a version designed specifically for meeting the needs of the researchers, students and others in academia who carry out qualitative data analysis. However, it facilitates unlimited data analysis without any restrictions on the timelines similar to the primary version. The unlimited access made a difference to opt for the tool among the few other similar tools available online with limited access. Although available for free, the tool was equally flexible compared to other similar tools to add new codes, delete, modify and reorganize according to the need.

For the current study, the tool facilitated the platform to import the documented data to carry out thematic analysis. The reflections of the participants, relevant observations from the researcher's field notes were collated, the essential interview responses were transcribed and documented for the analysis (Samples attached as Appendix VII). As shown in the figure 4.0 below, the tool displays three

vertical sections on its home page. The “DOCUMENTS:” section at the centre displays the documented textual data uploaded onto the tool. The column on right is the section that displays the codes attributed to different segments of the text. The section on the left has sub sections ‘CASES’, ‘VARIABLES’ AND ‘CODES’ as seen in the figure 4.0. The ‘CASES’ section shows the documents uploaded. The ‘VARIABLES’ section shows the current document under access and its other details if defined for the document. And the ‘CODES’ section displays the codebook which has themes and codes.

Figure 4.0 Thematic analysis software tool (QDA Miner Lite)



To note, the figure displays the themes first and then the codes but while analysing, they emerged the other way round, codes first and then the subsequent themes. For instance, the text marked in green in the first learner response seen in the DOCUMENTS column (“usage of the sentences”) was given the code “Learnt word use by using” as seen in the third column. The code in turn lead to arrive at the theme

7, “Learnt through exposure to word use”, as seen in the left column. As seen in the left column of the figure 4.0, the common codes are placed together under a theme (numbered) that emerged from the commonality observed among the codes.

To carry out the analysis on the tool, the documents with the gathered textual extracts from the reflections of the participants, field notes and the relevant interview responses were imported into the tool. The documents were named as “Perceptions on using online learning tools”, “Document _2” and “Document _3” as seen in the figure 4.0. The text on the documents was read thoroughly to get familiarized with all the possible insights. Then the common responses noticed were coded together under a common code. The same procedure was followed to code the text across all the documents. There were some codes that emerged on the perceptions of learning vocabulary and some other codes on the perceptions on the use of the online tools. The codes pertaining to vocabulary learning were named after a linguistic feature commonly identified among the extracts. And the codes pertaining to the use of the online tools were named after common perceptions on the use of the tools. So, the codes were drawn in relation to the theoretical framework of Vocabulary learning and the online learning used in the study.

After carrying out coding for all the documents, the codes were reviewed again to alter or rephrase any of them if needed. Then the codes that could be joined together were identified and categorized under common themes as shown in the figure 4.1. The themes and codes were reviewed time to time under the supervision of the research guide and reorganized by segregating them the best way possible to realize the perceptions of the participants from the data. Consequently, there were 16 themes identified. When the 16 themes were closely observed by the research guide and the researcher, broadly they were either in congruence with learning vocabulary using the

online tools (First objective of the research question) or with the very notion of usefulness of the online tools (Second objective of the research question). Out of the 16 themes, the first 10 themes report learners' perceptions on learning vocabulary using the online tools, under two sub-sections. The last 6 themes report the learners' perceptions on the use of online tools to learn vocabulary under the third section. The themes on learning Vocabulary are shown in the figures 4.1 and 4.2. And, the themes on the use of the online learning tools are shown in the figure 4.3.

4.4.2 Section I: Themes of perceptions on Vocabulary learning

The themes that emerged while understanding the learners' perceptions on learning vocabulary using the online tools were categorized under two super themes. First, the themes of perceptions regarding what was learnt in the words. Second, the themes of perceptions on how they learnt what they learnt. In other words, the first one is about what word knowledge was attained as a product and the second one is regarding the process involved in attaining it. This categorization was drawn with respect to Scott Thornbury's perspectives on 'What is in a word' and 'How words are learnt'. All through the participants' reflections and responses it was evident that they perceived the online learning tools to have facilitated vocabulary learning by emphasizing on the aspects of word knowledge such as form, meaning, deeper word knowledge, use of the words etc. which are reported as themes under two super themes as follows.

4.4.2.1 Themes of perceptions on what was learnt in the words

4.4.2.1.1 Theme 1: Learnt Word forms and Word classes

4.4.2.1.1.1 Learnt Orthographical and Phonological forms

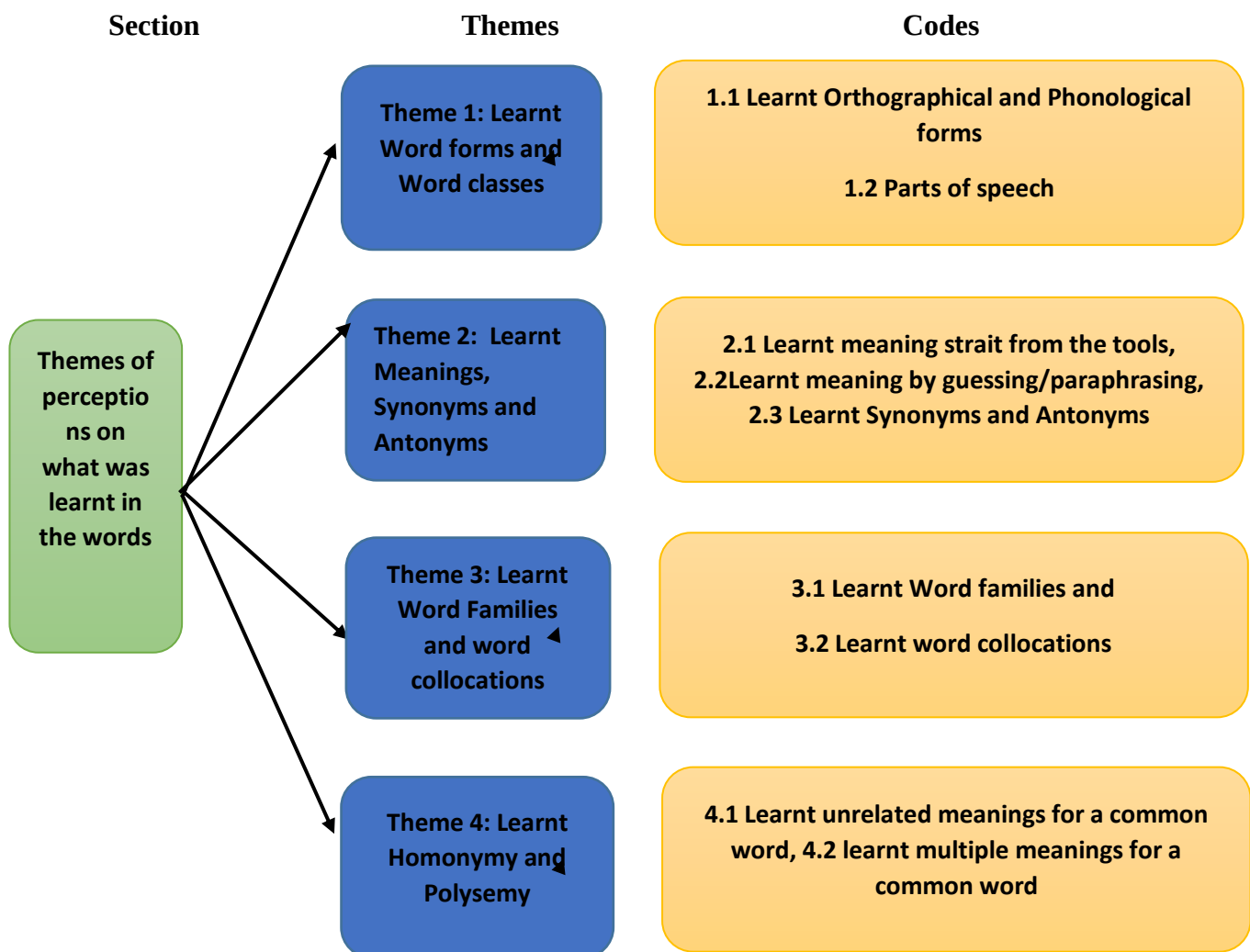
All the participants viewed that they began learning the words either by realizing their forms or by knowing their meanings depending on the familiarity and difficulty level of the words. In case of unfamiliar or difficult words, first the forms of the words were realized as how they were spelt (orthographic form) and uttered (phonological form) and then shifted to meaning whereas in case of the familiar or easier words, they quickly shifted to meaning.

Firstly, the orthographical forms were learnt while solving the first section of each task, where they were instructed to rewrite the target words included in the task irrespective of their level of familiarity. The section was designed for the same purpose of making them realize their familiarity with the form and a need for more practice in certain cases. Secondly, if they needed further practice in case of difficult words, they used repeated learning on the online tool, Quizlet using the ‘Learn’ and ‘Test’ options which provides the learners to type the word spelling repeatedly till they master it.

The objective of making them use ‘Learn’ and ‘Test’ options on the tool was to enable them to master the form before learning other aspects. The objective was found to be met during the interaction. Learners commonly responded that for unfamiliar and difficult words, they opted for further practice of spelling. The perceptions on learning forms of the difficult words were evident in the participants’ reflections. For instance, Participant 15 reflected that, *“The tools gave more practice to learn difficult words better”* and participant 33 mentioned it as, *“I enjoyed testing myself on the Quizlet tool and such new practices on these tools helped in repeated learning.”* During their practice, the tools also provided immediate feedback that was

positive and encouraging, even if the learners were right or wrong. When a group of learners went wrong typing the word ‘Scourge’ given in Task 7 as ‘Scorge’, the tool popped up the phrase, “Close enough, you are correct,” and displayed the correct spelling by highlighting the error letter in bold as ‘Sc**o**urge’. Learners were found to like such feedback.

Figure 4.1 Themes of perceptions on what was learnt in the words



The phonological forms were learnt by playing the pronunciation provided on the tools. As observed during the sessions, they checked the pronunciation for the unfamiliar and difficult words and repeated them over

time. For instance, for the words like 'Vitiate', 'Scourge' and 'triage', many learners were observed to check the pronunciation on the online dictionaries and flashcards. The observations made were also realized in the participants' reflections. For instance, participant 26 reflected on learning the phonological form of the difficult words by mentioning that, "*The online tools helped me to pronounce the difficult words and practice.*" Similar reflections on learning pronunciation include, "*The tools helped me to learn how to pronounce the words and their meaning*" (Participant 12). During the interview, when participant 26 was shown his reflection and asked if he could recollect any of such words, he responded, "*Yes, the word "Vitiate" for example.*" When he was probed further to share how he pronounced the word before listening to it on the tool, he responded that he did it as /vɪtɪet/ instead of doing it as /vɪʃɪet/.

Apart from learning using the online tools, learners also approached the researcher while doing the tasks to pronounce some of such words for them and then they practiced them orally. For instance, participant 28 initially pronounced the word 'Pivotal' as /pəɪvəʊtəl/ and resolved to pronounce it as /pɪvətəl/ after seeking help from the researcher. He was also suggested to listen to its pronunciation on the online dictionary or the flashcard provided on Quizlet if needed at a later time.

4.4.2.1.1.2 Word classes (Parts of speech)

In the current study, the target words provided to the participants were majorly content words and hence were of four classes: nouns, adjectives, verbs, and adverbs. Participants referred to them otherwise as parts of speech

in their reflections and interview responses. They were given an activity to identify the role played by the target words in the given text (either by using the contextual cues or by checking them on the online tools) and to find out three other forms using the online tools. As instructed, they explored the forms using the tools, filled them under the appropriate column in the given table, and submitted the tasks.

Participants' reflections, shared after doing the tasks, commonly imply that they learnt parts of speech with the help of the online tools and their use made the process easy. In this respect, participant 14 deliberately stated that *"The parts of speech has always been a trouble for me, but I can surely tell now that learning parts of speech using these tools was very easy, and it has helped me know about the word more."* Some other participants believed that the use of online tools has helped to notice and differentiate varied forms. Participant 27, for instance, said, *"Some of the tools show the different forms of the word and its usage, so it helps me to remember that word and... easily."* While few perceived that learning parts of speech got easier and could remember better, few others perceived that it was possible because the tools presented different forms together comprehensively. Participant 3 during his interview for instance, responded that *"I have learnt different parts of speech for the words and it was easy as they were readily available on the tool 'Wordhippo'."* Similarly, participant 15 responded on the tools providing the information together: *"I am able to see different forms around a word, its parts of speech, and its origin in one place..."*

Reflections of the participants were validated by triangulating during their interviews. When participant 14 was displayed the above reflection during her interview and probed to share if the exercises made a difference or the use of the online tools in learning word classes and how, she replied in detail. Her elaborate response is broken into parts and analysed as it encompassed many of her peers' experiences who could not verbalize it so explicitly. To give a better picture of her learning word classes experience in the online setting, she gave the background of the contexts in which she usually came across new words and how she had been learning. She said, *"Generally I know a word because I read it or I heard it somewhere someone using it...But when I used to come across more information about the word, I was getting confused about the word, thinking if I am using it in a right way or using it wrongly..."* It infers that learners usually draw new words from some contextual source and get familiar with the specific form in use there. It further infers that they see learning its other parts of speech as extra information though it is essential to understand the role a word plays in different contexts. Consequently, they get into ambiguity when they attempt to use it.

Then she continued to convey how she integrated the use of online tools to learn word classes by mentioning, *"I started using the online tools... only because we were given some exercises where we need to find out the parts of speech and give sample sentences for them. I really did not pay much attention at the beginning. I was like I am supposed to do it, and I did it..."* Her response evidently depicts the learner's hesitation at the beginning to actively engage in learning word classes despite gaining an awareness of the tools that could help her. Then she realized the purpose of using the tools and

how they made it easy to learn the word classes: *“But later I started understanding how I should do it and started forming my own sentences using different forms of a word. That’s when knowing parts of speech was getting easy for me.”* Her response implies how learners realized the objectives of the tasks given and then used the online tools meaningfully. Learning the word classes was evident during the researcher’s observation too. They showed their interest in using the tools to find out the word classes while doing the tasks. They were observed to be using different online tools like Visuwords, Wordhippo, and yourdictionary to check the word classes displayed and use them to complete the tasks given.

4.4.2.1.2 Theme 2: Learnt Meaning, Synonyms and Antonyms

All through the participants’ reflections it was evident that they perceived to have learnt the form, meaning, deeper word knowledge and the use of the words with the help of the online learning tools. Having presented the perceptions on learning the form in the earlier theme, the perceptions on learning the meaning are presented under the current theme. In addition, the perceptions on learning Synonyms and Antonyms are also presented under this theme as they implicitly contribute to better learning of meaning.

4.4.2.1.2.1 Learnt meaning directly from the tools

In each task, the learners were asked to produce the meaning of each word as they understood it using the context or by exploring it with the tools. They produced the meaning in the respective column and submitted the tasks.

It was their choice to draw the meaning either from the contextual cues or the online tools as per their need. It was found that the meanings of some words were learnt directly from the tools. For instance, participant 14 has reflected on learning a new word this way: *“Never heard of the word but as soon as I searched for the meaning using an online dictionary, I... understood the meaning....”* It implies that the meanings of the completely unfamiliar words were learnt from the online tools. The majority of the learners perceived that different online tools suggested in the study helped them learn meanings. Participant 3, for instance, viewed, *“Using not just Google dictionary but also Visuwords, Merriam Webster, Quizlet and Wordhippo fascinated me to explore word meanings... to do the given activity.”* Such reflections imply that learners learnt the meanings of certain words directly from online tools. Further, to draw from the researcher’s field notes made during the sessions in this respect, it was noted that every learner was eager to find out the meanings of the unfamiliar target words on the online tools of their choice immediately after giving them a task.

4.4.2.1.2.2 Learnt meaning by guessing/paraphrasing

Learners were found to continue the use of traditional guessing and paraphrasing skills while learning with the online tools too. Participant 19, for instance, reflected that *“I find it easier to first understand the context in which it was used, then look up its meaning...”* However, differing from the traditional learning practices, sometimes they used them more extensively; they elicited meanings from the context within the given text and also the additional contexts in the authentic sentences facilitated by the tools. In this

respect, participant 14, shared that *“the tools... and the example sentences helped me understand the meaning.”* They did it if they could not get the meaning from the given context or even if they wanted to learn the word in more contexts. Such views imply that the learners used multiple contexts facilitated by the online tools and exercised guessing and paraphrasing skill to draw meaning. Below are a few reflections of a similar perception:

“Reading many sentences on the tools helped me in paraphrasing the word meaning on my own”. (Participant 13)

“online dictionary helped to guess the word meaning from the sentences contexts and easily learn” (Participant 25)

In the same line, the researcher’s field notes reveal that the learners went through different sentences given on the online dictionaries to guess the word meanings from the contexts during the sessions. In case of any difficulty faced with a sentence, they shifted to the following sentence. This continued till they found a sentence of their comfort to elicit meaning. In such ways, learners actively used guessing and paraphrasing skills and learnt meanings.

4.4.2.1.2.3 Learnt Synonyms and Antonyms

The participants' reflections imply that they turned proactive in exploring Synonymy and Antonymy going beyond accessing the information displayed on the primary web pages of the tools. When participant 20 was enquired about the procedure he followed in learning the words; he responded that *"Firstly I have searched for the meaning and later I tried to find its*

synonyms, antonyms... using the online tools. They were readily available."

Participant 36 reflected similarly, "*Online dictionaries helps in understanding the meaning of the word, from there i find words with similar meaning of the words....*" When Participant 26, during his interview, was probed to respond on how the online tools made a difference in learning words compared to the resources he used in his earlier classroom practices, he responded, "*They not just provided different meanings but also provided different words that mean the same and many related words to it.*" It implies that they found their interest in finding out the equallents and the opposites for the words and learnt them. Similarly, Participant 8 shared that "*Even the hard words are easy to understand as we are going through the synonyms and antonyms.*" It implies that the learners used synonyms and antonyms also as the anchors to understand the target words.

4.4.2.1.3 Theme 3: Learnt word families and collocations

In addition to learning peripheral word knowledge pertaining to form and meaning, the learners reported to have also learnt deeper word knowledge such as word families, collocations, homonymy and polysemy using the online tools. Findings with reference to learning word families and collocations are presented under the current theme 3 and the findings with reference to learning homonymy and polysemy are presented under the next theme, theme 4.

4.4.2.1.3.1 Learnt Word families

Critical analysis of the reflections of the learners led to another finding that they had learnt word families in the process of learning vocabulary using the online tools. While participant 5 for instance, stated: "*I have used*

visuwords for learning different forms of a word with prefixes and suffixes.”

few other participants reflected by referring ‘inflections’ in their simple terms as ‘the related words’ surrounding the target word which formed a semantic map. Participant 9 in this respect conveyed that *“With the help of visuwords I was able to look up how the word relates to other words”*. Similarly, many others conveyed on learning word families acknowledging the other online tools they used. One conveyed that *“They helped to learn a word and also the other words related to the word.”*(Participant 20). Similar perception was observed from the participant 15 who reflected in reference to the accessibility of the whole word family at one place: *“The tools provided lot of information on the words and their related words at the same place.”* The tool ‘Wordhippo’ sensitized the learners to the word families by providing such related words in the form of lists, with their meanings. In reference to the tool, participant 1 reflected that *“Wordhippo.com helped me to gather all the related word forms”*. During the intervention the participants were noticed accessing Visuwords and other tools for inflections and derivatives of the target words in their respective web pages. Such reflections and observations implied their learning of word families that added to the deeper word knowledge.

4.4.2.1.3.2 Learnt collocations

By analysing the reflections and the sentences formed by the learners while doing the tasks it was also found that they have learnt collocations which contributed to the learners’ deeper word knowledge. The participants reported to have learnt the collocations in two ways: by noticing the structure

of the sentences that interwove the target words with their neighbouring words and by forming their own sentences following the pattern of the words in the sample sentences they noticed. Participant 21 for example reflected on learning the collocations of the target words by mentioning that, “*The online tools gave me more examples to get familiarized with the word and to learn with what other words and contexts it is used in detail*”. Similarly Participant 26 viewed that “*The online tools made the task easy to learn the words quickly... by providing more examples for the usage of the sentences.*” The reflections imply that the multiple contextual sentences they read on the tools familiarized them with the words and their different ways of their use (learnt by noticing).

For instance, the word “fleet” (a target word in task 5) on the tool ‘Visuwords’ is presented with its collocations such as ‘fleet of warships’ or ‘fleet of aircrafts’ giving details as a group of warships or aircrafts moving as a unit, ‘fleet of vehicles’ referring to the group of vehicles operating under a common ownership, ‘fleet of birds’, group of birds flying together, ‘fleet of foot’ referring to quickly moving foot, ‘fleet of thought’ referring to an idea that lasts for a moment in one’s memory.

Noticing such collocations, learners have put the word to use in their own sentences learning them further in their second way. A look at the below sentences they formed imply their application of the collocations into use.

Participant 17: “*The fleet is progressing towards the border.*”

Participant 3: “*The government of Telangana has signed an agreement to buy a fleet of electric buses from Tata motors.*”

Participant 5: *“For a fleeting moment, I saw the face of a boy.”*

Similarly, participant 24 had formed his sentence using the word ‘Anoint’ with its right collocations in a religious context. It reads *“The priest anointed the new king with oil.”* implying that learners not just learnt the contextual use of the words but also with the right theme specific collocations.

A close look at the above three sentences further imply that the learners have used the word ‘Fleet’ with three different collocations of their choice. First, the sentence formed by participant 17 for example, refers to a group of warships or aircrafts moving towards the border. In this sentence, the word ‘Fleet’ is used by collocating it with the word ‘progressing’. Second, the sentence of participant 3 implies that the learner has put the word referring to a group of vehicles. The participant used it in a contemporary context of a government placing an order for a group of pollution free buses. Here, the word ‘Fleet’ is used collocating it with the preposition ‘of’ and with the plural noun phrase, ‘electric buses’ (‘a group of vehicles’ as they learnt). Third, participant 5 in his sentence refers to the word ‘fleet’ to a very short instance one may come across. He uses the word ‘Fleet’ by collocating it with the word ‘moment’. Lastly, the word ‘anoint’, which was a target word given in task 7 often used in religious contexts and specifically in the context of a church was learnt rightly. It frequently collocates with the words ‘oil’ and the ‘priest’. Majority of the participants have formed their sentences using these two words.

4.4.2.1.4 Theme 4: Learnt Homonymy and Polysemy

With reference to learning the deeper word knowledge, in addition to learning aforementioned word families and collocations the learners reported to have also learnt homonymy and polysemy using the online tools.

4.4.2.1.4.1 Learnt unrelated meanings for a common word (Homonymy)

While doing the tasks, the participants were found to have learnt Homonyms. For instance, for the word ‘unwind’ (a target word in task 5) when they were instructed to form two sentences of their own in the task, they formed them using two different meanings they noticed on the tools as below.

Participant 17:

Sentence 1: “*Reading helps me **unwind** myself*”

Sentence 2: “*She started to **unwind** her scarf*”

Participant 8:

Sentence 1: “*I **unwind** myself during the vacation*”

Sentence 2: “*I had to **unwind** the roll to complete packing*”

The sentences formed by participant 17 imply that he had learnt two unrelated meanings for the word ‘unwind’ and put them to use. Firstly, ‘to stop worrying or to start relaxing’ and Secondly, ‘To remove in a circular fashion, mostly in a direction opposite to the existing’ as in unwinding a roll

or a wire. Similarly, the sentences formed by participant 8 also imply that he had learnt and used two unrelated meanings of the word.

Further, participants were found to have learnt homonyms

4.4.2.1.4.2 Learnt multiple meanings for a common word (Polysemy)

The participants were found to have also learnt Polysemy. For the word ‘Firm’ for instance, they learnt multiple meanings and formed sentences while doing their task. Participant 10 formed the sentences “*I held her hand **firmly***” and “*He is known for his **firmness***” with different meanings, ‘steady’ and ‘determined’. Few other similar sentences formed by the learners for the word include, “*Despite being hit by the car, the post was still **firm***”, “*Stock prices **firmed** again today*” (Participant 22), referring to the meanings ‘steady’ and ‘shrink’ in her sentences, and “*There is a web series on Netflix, that tells the tale of how a law **firm** operates*” (Participant 3) referring to an ‘organization’.

While learning another word ‘radical’, a target word in task 3, they learnt multiple meanings provided on the online tool ‘Visuwords’. The meanings were from different fields of study such as Chemistry, Mathematics, Botany, Linguistics and Political science. The tool presented multiple meanings for the learners as below.

Chemistry: A group of atoms that act as a unit

Mathematics: A number expressed as the root value of another number

Botany: Something that arises from the roots of a plant

Linguistics: The base form of a word

Political science: A revolutionary, Towards an extremity etc.

While doing the task or even during the interviews, it was not so surprising when the majority of the learners shared that they knew one or two meanings from their familiar disciplines among the above. It was quite possible because they were familiar with the word meanings in ‘Chemistry’ and ‘Mathematics’ as all of them had studied the subjects in their intermediate and/or graduation. However, they found their interest in knowing meanings from unfamiliar domains too. Learning different meanings was evident also in the tasks they did. They completed their respective tasks by forming two sentences with the meanings of their choice as instructed in the task. Some of such sentences include:

Participant 1:

Sentence 1: *“This school is **radically** different from most others”*

Sentence 2: *“The government is putting through some **radical** social reforms.”*

Participant 3:

Sentence 1: *“Some youth upon experiencing tough times in life, strive to change their lives **radically**”*

Sentence 2: *“The speaker expressed herself **radically** as she highlighted the need for awareness of anti- social elements.”*

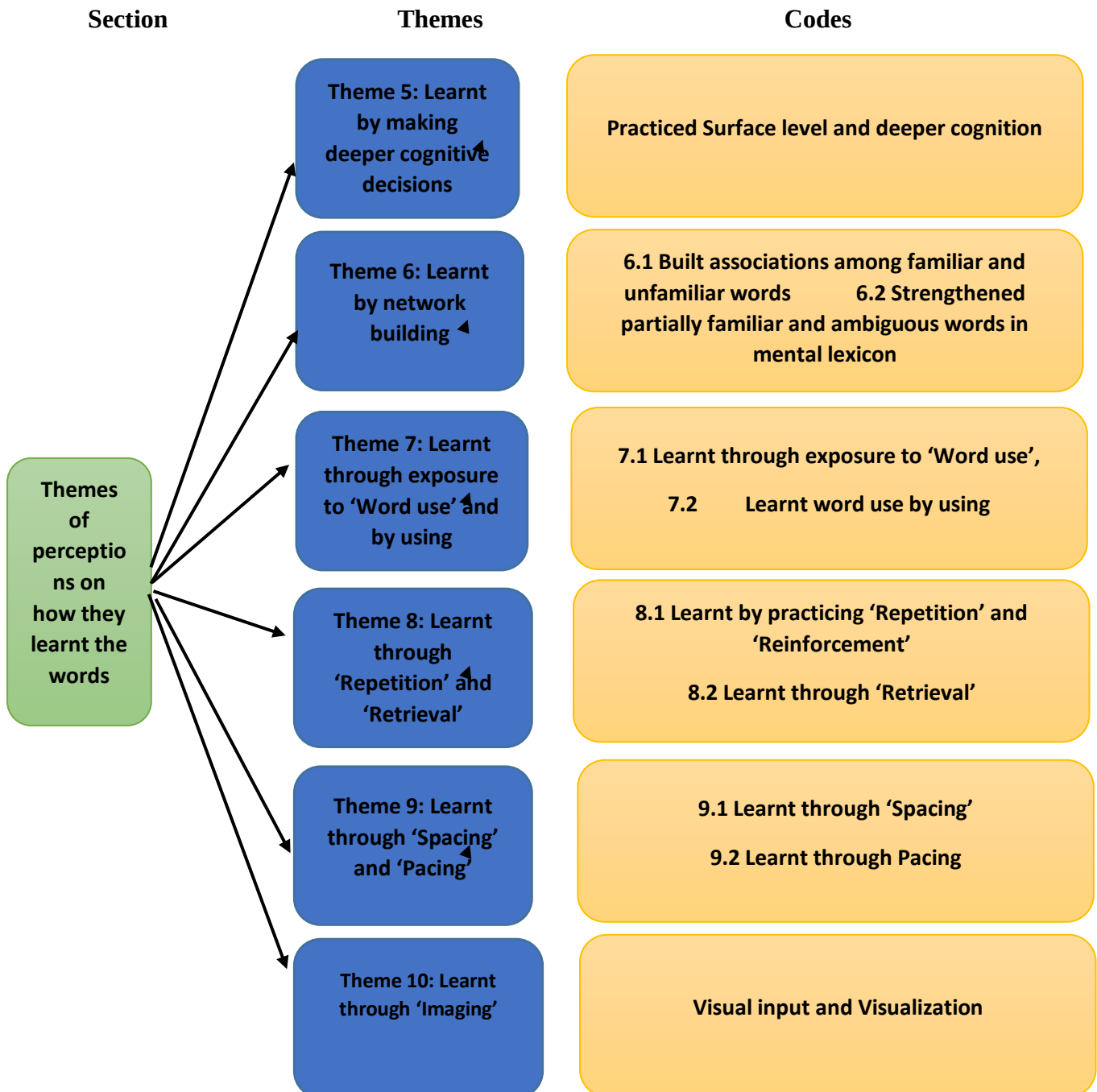
A close look at the sentences imply that they formed sentences with different or overlapping meanings. However, an attempt to use different discipline specific meanings was not yet into practice. For instance, from the two sentences formed by Participant 1, it is evident that for the word ‘radical’, she used two different senses of the word: ‘very much different’ and ‘new/revolutionary social reforms’ respectively. However, both meanings are commonly from the ‘Socio-political’ domain. It was the same with Participant 3 and most others too. The reason behind it is unclear as they were instructed to form just two sentences in the task. It might have limited their scope to demonstrate their learning of multiple meanings. Or they might have found their interest in using the meanings from the Socio-Political domain rather than domains like Botany. However, it is noteworthy that they shifted from their much familiar streams ‘Chemistry’ and ‘Mathematics’ to a partially familiar ‘Socio-Political’ stream to learn and form sentences using the target word.

4.4.2.2 Themes of perceptions on how they learnt the words

To learn a word is to remember a word longer, which in turn relies on one’s memory. To remember a word for a longer time, it is important to manipulate the word knowledge in the working memory and make as many decisions as possible. The more cognitively demanding such decisions are, the better to remember a word (Thornbury, 2002). Thereafter, it is essential to transform such manipulated word knowledge into the permanent section of the long-term memory too. To do so, a learner has to carry out multiple practices such as network building, repetition,

retrieval, using, spacing, pacing, imaging, mnemonics, motivation etc. The learners in the study were found to have practiced many of these practices while learning vocabulary using the online tools. Below are the themes that emerged from their perceptions on learning the words.

Figure 4.2 Themes of perceptions on how they learnt the words



4.4.2.2.1 Theme 5: Learnt by making deeper cognitive decisions

As mentioned above with respect to remembering a word, the more cognitively demanding the decisions made in the working memory are, the better that the words are remembered. Matching a word with its meaning or picture for instance as Scott Thornbury believes is a surface level decision, confining on its parts of speech is a deeper decision and putting a word to its use is a further deeper decision in the working memory. The learners in the study have moved beyond finding the meaning of a word to explore different parts of speech for the word, other words with similar meaning and opposite meaning, the sentences in which the words are used and how to put the words into right contexts and collocations. All the participants have shared their perceptions on this transition in their process of learning either through their reflections or through their responses during the interview. Participant 23 for instance, responded during his interview saying that, *“Earlier I used to google a word but recently instead of doing that I started to use other resources like ‘yourdictionary’ which gives its meaning and also some other sentences using the same word. So we will understand like in which sort of situations it could be used. As there are ample sentences, we could refer another sentence of our choice if we cannot make sense from one. It was also providing many synonyms for a single word...”* In such a manner and as mentioned earlier under theme 2, the participants have explored the word knowledge going beyond the meaning and pronunciation provided on the first page of the tools when they searched for a word. This shift from peripheral to a deeper word knowledge has become a part of their learning process over time. For instance, participant 20 while sharing the procedure he followed in learning the words,

responded this way: *“Firstly I have searched for the meaning and later I tried to find its synonyms, antonyms, other forms as verb, noun, adjective etc. and sentences of the word using the online tools. They were readily available.”*

Participant 36 reflected on word use by mentioning that, *“Online dictionaries helps in understanding the meaning of the word, from there i find words with similar meaning of the words and try to form a sentence.”* Such reflections and responses implied that they made decisions of all three cognitive levels mentioned above, beginning with the peripheral word knowledge to the deeper knowledge.

The task given to the learners was also in a gradation. They were first asked to rewrite the target words given for the day to overcome the gaps if any in knowing its written form. Then they were instructed to identify the part of speech of the target word and find out other three possible forms among the noun, adjective, verb and adverb forms. Then they were given space to write the meaning as they understand having read the definitions or the sample sentences given on the tools and then produce two sentences of their own using the part of speech of their choice. This could have steered them to learn in a graded fashion at the beginning. However, they could have left the practice if they did not find it useful. But the learners continued to follow it as they responded even at a later point of completion of the tasks in their interviews as mentioned above.

4.4.2.2.2 Theme 6: Learnt by network building

4.4.2.2.2.1 Built associations among familiar and unfamiliar words

The participants have commonly reported that they could relate the unfamiliar words to the familiar words while learning using the online tools. Usually, one's background knowledge plays a pivotal role in this process of learning new words. In the context of this study too, learners would have engaged their background knowledge but additionally they have acknowledged the role of online tools for helping in doing it by sensitising them to the lexical networks of the known and the unknown words. For instance, participant 20 reflected stating that, *"The tools helped in connecting the new and the known words."* And participant 9 viewed that, *"I was able to look up how the word relates to other simpler words which I previously knew."* During the interview when participant 9 was probed by asking *"Was it a new approach to you to use such tools? Didn't you relate the words this way earlier?"* He responded that, *"Earlier what I used to do was to look up the word and at the most, the usage of it on google. Apart from that I did not explore any other tools like the ones used in doing these tasks. So this is new to me"*. To draw more explicit insights on whether he practiced relating the words earlier and if the online tools made any difference he was asked further: *"Did the use of these tools help you doing it better compared to your earlier experiences?"* He responded saying, *"Yes, even though I used to look up the meanings earlier, this time with the help of tools like Visuwords, I was able to see how that word relates to some other word that I already know. This way that word made a lot of sense to me."* Such responses implied that even when

the learners used online resources earlier, they hardly related unfamiliar words with the familiar ones but limited to looking up the word meanings. They shifted to noticing the associations among such words and to active building of networks while using the online tools like Visuwords familiarized in the study

4.4.2.2.2.2 Strengthened partially familiar and ambiguous words in mental lexicon

The learners viewed that the online tools not just helped in learning the unfamiliar words but also in learning the partially familiar words to learn further. For instance, participant 18 had reflected on both levels of familiarity. Under one task, he mentioned that, *“I found learning the words very interesting this way as some of the words are pretty new to me and I have learnt new words and where to use them and in what context.”* Under another task the same participant has also mentioned that, *“I got to explore more about the words that I already know little bit...”* Participant 1 reflected on learning the partially familiar words in her reflective journals this way: *“Knowing that already learnt words can also be learnt better is what interested me today.”* Similar responses on learning such words and enriching them in their mental lexicon were noted with many of the participants in their individual interviews as well. When participant 26 for instance was asked if he could also learn partially familiar words better, he replied that, *“The tools not only helped in learning new words but also the partially familiar words like how to use them and in which contexts they are used”*.

With reference to learning the ambiguous words, participants perceived that the online tools enabled them to overcome the ambiguity they had earlier on a word or they may face when they try to learn a word deeper. Participant 14 for instance viewed that, *“I always get confused if I know more about a word but the use of these tools and the exercises in learning words helped me overcome that confusion.”* Few others viewed that the elaborate content available on the tools helped to overcome the ambiguity. For instance, participant 11 shared that, *“...with the help of the content on the tools. It gave a better clarity than earlier”*. Such perceptions imply that they overcame the ambiguity on certain words and strengthened the word knowledge in their mental lexicon.

4.4.2.2.3 Theme 7: Learnt through exposure to ‘Word use’ and by using

As mentioned under the section ‘Themes of perceptions on Vocabulary learning’, all the learners have perceived that the use of online learning tools has emphasized on the word use along with form, meaning and deeper word knowledge. The perceptions pertaining to learning form, meaning and deeper word knowledge are reported under the first super theme, ‘What was learnt in the words’ whereas the perceptions on learning ‘word use’ are reported under the second (current) super theme, ‘How did they learn the words’ as it adds to the process of learning.

Their perceptions on the word use were identified under two codes, “Learnt word use through exposure” and “Learnt word use through using”. The former refers to the exposure on the word use that the learners got from

the online tools and the latter refers to how they applied the knowledge they gained into using the word. In other words, the first code refers to the knowledge gained on word use by the participants being passive and the second code refers to the word knowledge gained by putting the word to practice being active. The perceptions pertaining to both the codes are as below.

Further, participant 26 reflected on the deeper word knowledge gained with reference to the unfamiliar words learnt using the online tools, *“They gave me lot of new information on the words that I did not know so far and how to use in a sentence.”*

4.4.2.2.3.1 Learnt through exposure to ‘Word use’

The perceptions of the participants that revealed the immense exposure the learners got on the use of the words were categorized under this first code. They believed that they got familiar with the word use with the help of multiple contexts. Participant 18 reflected that, *“I found learning the words very interesting this way as some of the words are pretty new to me and I have learnt new words and where to use them and in what contexts.”* Participant 27 also reflected similarly by mentioning that, *“Some of the tools shows the different forms of the word and its usage, so it helps me to recollect that word and its meaning later easily and remember for longer time”*. The learner viewed that they could remember the usage of the word longer when they got such an exposure on the tools.

They also believed that the online tools have not just familiarized the use of a target word but also the use of its related words. For instance, participant 11 reflected that, *“Understood the different parts of speech of the word and how to use them, with the help of the content on the tools. It gave a better clarity than earlier”*. It also implies their improved knowledge on the word use when compared to their earlier learning. Participant 21 reflected that, *“Referring more sentences using the word in a very short time and know much about a word use...”* was something that interested him on that day while doing the task. During the sessions, along with the sentences the learners were found to have read many famous quotes facilitated by the tools to familiarize themselves with the variety of contexts of word use.

4.4.2.2.3.2 Learnt word use by using

Further perceptions shared on the word use imply that the participants were not passive recipients of the word use knowledge but they also actively attempted to put them to use in their own sentences. This was evident from the sentences they formed in their tasks, some of which were presented under earlier themes. It was also evident from the close observations made on the reflections. For instance, the participant 11 reflected in an earlier task that the online tools *“Helped me understand the context of the words and how to actually use them in sentences better.”* The same participant in a later task reflected that, *“They helped to know how to use a word effectively and I used then in a conversation”*. These imply that the learners on one side have got familiarized on the use of the words and on the other, overtime they also used

them in their communication. Participant 9 explicitly reflected it in his words, *“Using wordhippo and yourdictionary interested me to refer to find usages of the words in sentences. They helped in understanding words in various contexts and then form my own sentences.”* Participant 36 also shared a similar view that, *“Online dictionaries helps in understanding the meaning of the word, from there i find words with similar meaning of the words and try to form a sentence.”* The practice was also observed among the participants during the sessions as mentioned above. When they were given an activity instructing them to form their own sentences and submit, they actively engaged in building sentences and submitted them in the google classroom.

4.4.2.2.4 Theme 8: Learnt through ‘Repetition’ and ‘Retrieval’

4.4.2.2.4.1 Learnt by practicing ‘Repetition’ and ‘Reinforcement’

At the end of each task, the learners were instructed to carry out further practice on the words on Quizlet for reinforcement. They have done it each time they did a task. The learners have perceived that the activities like ‘Learn’ and ‘Test’ provided on Quizlet facilitated learning by Repetition and Reinforcement. There were common reflections noticed from the participants that led to arrive at the current code. Participant 17 for instance, reflected on repetition this way: *“online tools very helpful to me in order to get the meanings of new words and practice them repeatedly to remember well.”* Then participant 13 reflected on the reinforcement of learning facilitated by the online tools by stating, *“They reinforced learning by different activities*

and by playing a word game.” They also viewed that such practice enabled them to learn words effectively. Participant 15 for instance conveyed the view by stating that, *“The tools gave more practice to learn difficult words better”*. Some of the learners found the activity ‘Test’ given on Quizlet to be very positive in learning. Participant 33 conveyed it this way: *“I enjoyed testing myself on the Quizlet tool and such new practices on these tools helped in repeated learning.”* Such reflections imply that carrying out certain activities like written and the oral repetition, matching activities, filling activities, testing oneself etc. that were mediated by Quizlet were observed to be the sources of reinforcement.

4.4.2.2.4.2 Learnt through ‘Retrieval’

The participants viewed that the use of the online tools not just helped in learning words but also improved their memory and made it easy to recollect them at a later point of time. They attributed this impact to the use of pictures, different word forms, etymological information they accessed from the tools while learning words. Few such views were: *“Flashcards helps me to remember the meaning of the word as the pictorial representation of the words meaning lasts forever in our brain even if we forget the word”* (Participant 27) and *“I am able to see different forms around a word, its parts of speech and its origin in one place. This approach gave a better information to remember a word after learning it”* (Participant 15). During her interview, when participant 27 was probed to add more on her above reflection, she responded that the flashcards with the definition of the word on the flip side with a

supplemented pictorial representation made a real difference in memorizing and recalling the word at a later time. She continued to add that she formed an image of her own in her memory by linking the target word, its definition and the aligning picture provided which assisted her as a cue in retrieving the word even if she struggled to recollect the form of the word for a moment. With such views the participants have shared their perceptions on enhanced vocabulary learning through retrieval.

4.4.2.2.5 Theme 9: Learnt through ‘Spacing’ and ‘Pacing’

4.4.2.2.5.1 Learnt through ‘Spacing’

According to the principle of distributed practice it is believed to be better if the cognitive processes are distributed over a time period than carrying them all at once. In the case of learning vocabulary, it is suggested to present the words in a limited number of 5 to 10 words each time. These aspects have been practiced by the learners while learning vocabulary in the study. They were presented 5 to 8 words each week they learnt, which were interwoven in theme driven texts. They applied the principle of distributed practice both in terms of short term as well as the long-term practices. In short term practices, they spaced time between peripheral learning, deeper learning, repetition through different activities one after the other and then reinforcement. In long term practices, they continued to learn beyond the classroom by putting the words into their communication in their leisure time sometime during the week. They reflected on such practices in their reflective journals. For instance, participant 10 reflected on practicing at a later part of

the day this way: *“The flashcards and the games on Quizlet are a good source for me to go through or play any time after the session for reinforcement. These days I am accessing them during my leisure time in the evenings and I find it fun.”*

When they were followed up during the week or in the following week’s sessions also, it was observed that they attempted to put the words of their interest into their communication when they were taking a walk to their hostels or during their interactions in the mess as the participants in the study were enrolled into a residential mode of education. For instance, participant 28 during a brainstorming session mentioned that, *“I regularly formed sentences using the difficult words like ‘Pivotal’ and ‘Curtail’ that were given in the previous tasks and put them in interactions with my friends while having food in the mess.”* They were regularly reminded to continue the process of learning over time with their feasibility. They faced challenges with the hectic IT schedules but when got sometime over a day, they put the difficult words to communication.

4.4.2.2.5.2 Learnt through Pacing

Learners may have varied learning styles and different rates of processing data and would need opportunities to pace learning in their own ways. The participants in the study were allowed to avail flexibility of time needed to carry out memory-based activities while learning using the online tools. Majority of the participants during their interviews responded that their pace of learning using the online tools gradually increased. They said that they

comparatively took longer time in doing the beginning tasks having found the approach of using the online tools and deeper learning, as instructed in the tasks, to be unfamiliar and time demanding. For instance, when participant 23 was asked if he needed longer time to learn through this approach, he responded this way: *"To be frank I didn't understand these tools and their use at the beginning and it took some inertia ending up sparing more time. But when I got to know their architecture and their use, the amount of time I needed to spend was comparatively very less later on."*

When similar questions were asked to the participants in their interviews, many of them responded the same way. Participant 1 for instance responded on her earlier days of learning by agreeing that, *"Yes sir, in the beginning I used to take longer time to learn the words, complete the task and reflect. But gradually I got habituated to it and understood how to use the tools quickly. Then the time taken to complete the whole process decreased considerably."* Such views imply that they took longer time at the beginning but gradually when they got used to the approach, they increased the pace of their learning and reduced the time they needed to learn and complete the tasks considerably.

4.4.2.2.6 Theme 10: Learnt through 'Imaging'

Supplementing the learners with the visual images to learn or allowing the learners to visualize a picture while learning a word are comparatively preferred over other modes of input. Imaging in the context of the current study is realized in two senses. First, the images that were supplemented by

the flashcards to the learners and second, the mental image that the learners formed themselves in their memory while learning by associating different sources for making meaning.

The pictorial input supplements facilitated by the flashcards along with the target word definitions were perceived to be useful in drawing meaning (by integrating both the sources) and in creating better cognitive inscriptions in the participants' memory. Participant 26 responded in his interview that, *"As it is said a picture speaks more than words the pictorial representations provided on the flashcards were very helpful in easily registering a word in my memory."* Participant 24 had a similar reflection on the flashcards that, *"They were helpful in easily understanding the meaning through pictures on Quizlet flashcards"*. Some of the participants have also shared that they got motivated to learn with the pictorial representations of the words. Participant 7 for instance reflected that, *"Flashcards created interest to learn by looking at the pictures given there and the matching word definitions"*.

It was a common view observed among many of the participants in their reflective journals and interview responses that the pictures have aided in drawing the meaning and also retaining it for a longer time. Participant 27 reflected that, *"Flashcards helps me to remember the meaning of the word as well as the pictorial representation of the words meaning lasts forever in our brain even if we forget or confuse about the word"*. During her interview, she further added that the flashcards with the appropriate pictures on their flip side truly made a difference in learning the words by forming an image of her own in her memory that helped to recall the word later. It implies that the image formed assisted her as a cue to retrieve the word at a later time even if she was

confused with the word form. With these it was inferred that imaging has been perceived to be very helpful in learning words using the tools.

4.4.3 Section II: Themes of perceptions on the use of online learning tools

As mentioned earlier the themes that emerged over thematic analysis were categorized under two sections. The themes that were more relevant to the vocabulary learning using the tools were categorized under section I as presented above. The themes that were more relevant to the very use of the online tools were categorized under the current section II. Themes 11 to 16 are under section II. The codes that led to arrive at the themes are presented below with suitable extracts of the responses observed.

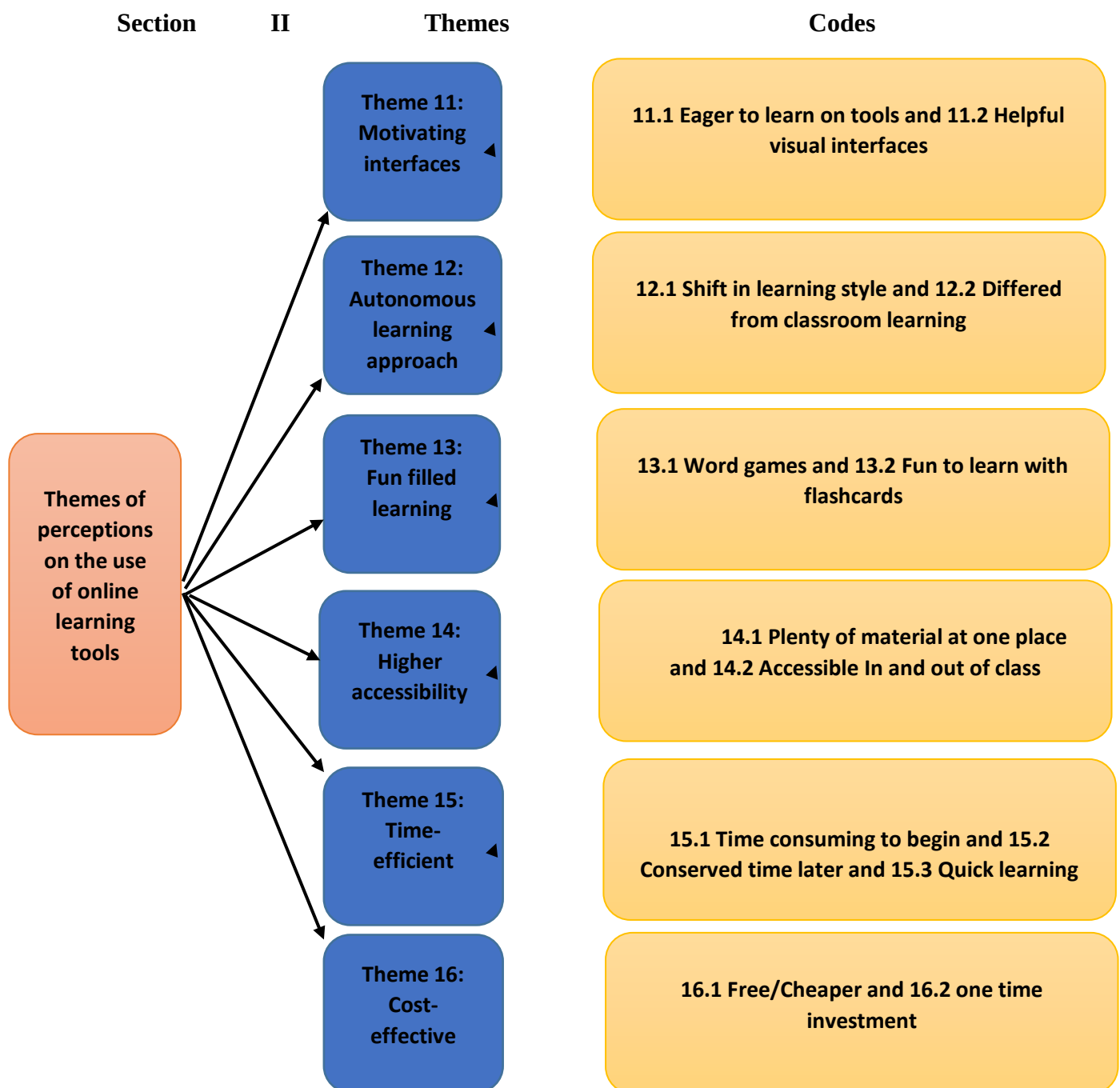
4.4.3.1 Theme 11: Motivating interfaces

The participants perceived that the interfaces of the online learning tools were motivating in nature in many ways. They were categorized into two major codes under this theme.

4.4.3.1.1 Eager to learn on tools

At the beginning of the study, an orientation session was conducted for the participants to familiarize them with the online learning tools. Majority of the participants viewed that after getting familiarized with the tools, they turned more eager to learn words using the tools during the study. Many of the learners viewed that all the online tools familiarized in the study encouraged them to learn words. They perceived the tools to be useful and drew a positive motivation. Participant 3 reflected that, *“Using not just Google dictionary but also Visuwords, Merriam Webster, Quizlet and Wordhippo facinated me to explore word meanings, its other forms and sentences using the words to do the given activity.”* Participant 18 mentioned that, *“I found learning the words very*

Figure 4.3 Themes of perceptions on the use of online learning tools



interesting this way as some of the words are pretty new to me and I have learnt new words and where to use them and in what context.” Few other learners found their interest in using these tools for the flexibility in learning, self-driven learning, learning beyond the classroom etc. For instance, the participant 9 viewed that, “Learning with these tools interested me as they gave

an opportunity to learn in my own way, in my leisure time and explore as much as we wish to learn about any word.” Participant 18 viewed that, *“the tools made learning beyond the classroom more interesting.”*

During the interview, when participant 23 was questioned about his overall view on the use of the tools, he mentioned that, *“...so for the learners they widened the scope of learning vocabulary.”* Participant 1 in her interview responded that not just one tool but different tools available drew her attention and she made her choice every time as per the learning need. She acknowledged what she repeatedly reflected in her reflective journals regarding the assistance she got from the multiple tools by saying that, *“wordhippo.com helped me gather all the word forms, Merriam Webster was handy for checking the meanings of the words, Quizlet.com is helpful to learn words with pictorial representations. Yourdictionary.com is handy to check a word in a sentence and visuwords.com for visualizing the related words.”* During the sessions, when the participants were learning vocabulary, it was observed that they used multiple tools based on their need and interest.

Participants also shared their specific views on the tool ‘visuwords’ under this code. They found their interest to learn with the architecture of the tool. Participant 14 mentioned that, *“...parts of speech fascinates me all the time. Visuwords and other tools presented it interestingly”*. Participant 24 had similarly viewed that, *“...the graphical interfaces made my learning interesting and better”*. Further they viewed that the ‘assessment for learning’ approach facilitated by Quizlet was interesting. Participant 33 reflected that, *“I enjoyed testing myself on the Quizlet tool and such new practices on these tools helped*

in repeated learning.” Majority of the participants from the intermediate proficiency level group found their interest in the use of flashcards. Participant 13 viewed that, *“Flashcards provided on Quizlet were interesting to learn words today and in earlier activities”*. Participant 7 also similarly viewed that, *“Flashcards created interest to learn by looking at the pictures given there and the matching word definitions”*. These views of the participants and the researcher’s observations during the sessions implied that learners were eager to use the online tools for learning and they drew a positive motivation.

4.4.3.1.2 Helpful visual interfaces

Under the earlier code, the perceptions that define their interest drawn from various features of the online tools were included. Whereas under the current code the perceptions that specifically convey the visual assistance learners derived are included. There were specific views with reference to the interface of Visuwords and Quizlet. Interestingly all the participants in the study viewed that the online tools have a visual edge while learning vocabulary. Participant 26 explicitly stated it this way, *“The thing that I found most interesting while using the online tools was learning with the visuwords platform. While searching for a word in this online platform it generates us the synonym, antonym and also the noun, verb, adjective and adverb of the given word in a particular animated fashion.”* Many others had similar views for the tool Visuwords. The participant 35 conveyed it in slightly different words, *“These platforms also provide the synonyms, antonyms and other surrounding words for the main word visually which are quiet helpful”*. And participant 9 conveyed it as, *“With the help of visuwords I was able to look up*

how the word relates to other simpler words which I previously knew.” During the sessions they were observed to be eager to use the visual interfaces like Visuwords and Quizlet immediately after giving the task for the day.

There were specific perceptions on Quizlet being visually helpful with its flashcards and interactive interface. Participant 24 viewed on the tool that, *“Helpful in easily understanding the meaning through pictures on Quizlet flashcards”*. More specifically learners with lower competency perceived the flashcards to be very helpful memory aids. Participant 27 from the lower proficiency group reflected that, *“Flashcards helps me to remember the meaning of the word well as the pictorial representation of the words meaning lasts forever in our brain even if we forget or confuse about the word”*. Another low proficiency participant 28 also reflected similarly that, *“Flashcards are useful with the pictures for the words to remember better. They help us to recollect if we forget word meaning also.”* During his interview, participant 26 responded that, *“As it is said a picture speaks more than words the pictorial representations provided on the flashcards were very helpful in easily registering a word in my memory.”* In the research field notes it was noted that, after the completion of the vocabulary activity, when the participants were asked how did they find using the tools, majority of the participants began their conversation with the researcher by referring to the visual aid they got from the tools’ architecture, more importantly from ‘Visuwords’ and ‘Quizlet’. More importantly, the learners from the ‘Intermediate’ language proficiency group spoke on them to be very helpful to learn the words given. Whereas the learners from the ‘Advanced’ language proficiency group viewed that they were specifically useful to learn difficult

words. One among them responded this way, *“the flashcards for the familiar or partially difficult words were not so useful but for learning the difficult words they were very useful.”*

4.4.3.2 Theme 12: Autonomous learning approach

The participants viewed that the tools have propagated autonomous learning. Their perceptions in this respect were categorized under two codes, “Shift in learning style” and “Differed from the classroom learning”. The results are presented below.

4.4.3.2.1 Shift in learning style

While doing the tasks, learners were encouraged to explore the word knowledge on the tools and go beyond what they needed to just complete the task. They were motivated to gain a deeper understanding of the word autonomously. The responses of the participants during the interview and in their reflective journals inform that they practiced autonomous learning earlier too but it has got transfigured as they shifted to new ways of self-learning. During his interview participant 23 stated that, *“The tools have definitely helped in visualizing the words and learning in new ways compared to my earlier ways like to just google a difficult word whenever I come across to find out its meaning and move on”*. The response implies that, learner autonomy has already been under practice in a way, as he mentioned that he used to search a word in google, but it is noteworthy that it took a new shape as he looked up for more word knowledge on the tools rather than finding meaning and moving on as he added. Similarly participant 1 responded on the pace of

learning by saying that, *“Classroom learning is not self-paced learning whereas online learning could be steered according to our need.”* When she was probed to respond during the interview if it was just for her or also for the peer group if she noticed, she responded that while learning using the online learning tools one neither need to wait for the others if they are slow nor hurry up for them if they are fast. So, it is applicable for all. In her case she was an ‘Advanced’ proficiency group participant and therefore she added that she could learn faster comparatively meeting her everyday course deadlines.

Participant 9 reflected on the shift in his learning style as he noticed himself learning in a self-guided way, in his feasible time and learnt to a greater depth of the word knowledge. He reported that, *“Classroom learning limits in terms of not letting us explore a word or concept more. There is a predefined way to teach something and everyone is at its mercy, regardless of their learning style. But learning with these tools interested me as they gave an opportunity to learn in my own way, in my leisure time and explore as much as we wish to learn about any word.”* Participant 13 reflected similarly using different words, *“Wide range of online content to reach and learn in our own way gives us to know where we are lagging and provides a scope to learn in our own style, time and speed.”* These imply a shift in their learning approach that redefined the learner autonomy.

4.4.3.2.2 Differed from the classroom learning

Participants have compared and contrasted the use of online learning tools to their earlier classroom learning practices. Both the ‘advanced’ and

‘intermediate’ group participants perceived the difference among the two approaches. Participant 23 of the former group reflected that, *“I was comfortable with classroom learning but when I began to use also the online learning tools, they tremendously added. My learning got lot better for me comparatively. I got to know about the word in much better way than I would get in a usual classroom without such tools”*. Participant 11 conveyed that, *“Understood the different parts of speech of the word and how to use them, with the help of the content on the tools. It gave a better clarity than my earlier learning.”* The participants perceived it to be a new learning practice. Participant 33 of the ‘intermediate’ proficiency group mentioned that, *“...enjoyed testing myself on the Quizlet tool and such new practices on these tools helped in repeated learning. It was new type of learning than classroom.”* Participant 26 also mentioned similarly that, *“Learning with tools like visuwords, Quizlet and online dictionaries was a new learning for me compared to my earlier classroom learning.”* Participant 18 distinguished in terms of the dictionaries’ use. He responded to a question that, *“To comment specifically on the online dictionaries, they were quite different in use when compared to the usual physical dictionaries.”*

Participant 1 from the ‘advanced’ proficiency group distinguished using internet from using the online tools during her interview. To a question asked to enquire if the approach was under her practice earlier, she responded that, *“This has been a new approach altogether because we used internet but not such tools ever.”* Few reflected on certain aspects found better in the new approach compared to their earlier classroom learning. Participant 24 from the

‘intermediate’ proficiency group viewed that, “...*graphical representations made learning better and remember well than classroom learning*” whereas participant 25 viewed that, “*The tools made learning faster and easier and it was different from the earlier practices*”. Such responses of the participants implied that they perceived the use of the online tools quite different from their earlier learning practices.

4.4.3.2.3 Need a mentor than a teacher

Participants perceived that in learning new words the online tools have been very helpful and they would need some basic instructions to use them effectively. Participant 21 while responding on the online tools during his interview conveyed that, “*A teacher’s interaction is not much needed while learning at least the new words but we may need it in forming new sentences or at a next level to communicate etc. where human touch is required.*” When he was probed further by asking that, “*Don’t you feel the gap when the teacher is not around you while learning this way?*” he responded that, “*I see it is difficult to get what we exactly want to derive about a word from a teacher, and that too to get it by all the students in a given time is a challenge, but we could get it from the online tools by exploring on ourselves. We would need the teacher just to guide with the right content and to give useful instructions to begin as a mentor. So, I did not see a gap for not having the teacher beside me but found the need of a mentor.*” Participant 18 responded slightly different in this respect by saying that, “*Use of technology as we know is a double edged sword. It has got many advantages but also the impacts like*

distancing the teacher. While using these online tools sometimes I felt that gap but I was able to cope with it by learning myself and approach you for any help as our mentors did.” Participant 5 responded on the need of a mentor by saying that, *“No sir, I don’t see it as a gap as such because everything I needed to learn was available on the online tools itself. I needed someone to suggest what I am supposed to do and learn as you did in the session.”* These imply that the learners have perceived that they could learn autonomously and looked for a mentor in case of any help they needed.

4.4.3.3 Theme 13: Fun filled learning

The participants perceived that using the online tools was fun filled. Many participants have conveyed it in their interviews by saying that the tools have facilitated fun filled learning. Their perceptions were two fold. First, regarding the fun filled games provided by the Quizlet tool and second, regarding the fun driven learning while using the flashcards. Their respective perceptions were coded under two different codes.

4.4.3.3.1 Word games

There were two word-games facilitated by the tool, Quizlet. One was a matching game and the other was a game named ‘Gravity’. Participants played the matching game while doing the task and the ‘Gravity’ game at the end of the task, depending on their interest and availability of time. The participants perceived that Quizlet with its games fetched better word comprehension. Participant 25 reflected on it saying that, *“The tools were helpful to know the meaning and also by providing funny word games to understand the word*

better.” Participants then reflected that the tools helped in reinforcement while playing both of the fun filled games provided. Participant 13 acknowledges it by reflecting that, *“They reinforced learning by different activities and by playing the funny word games.”* Not every participant had necessarily used the word games due to the hectic course schedules they had but they enjoyed when they tried to play the games depending on their time feasibility. When many of them were questioned on the comparatively lower use of the games, they commonly responded that by the time they reached the reinforcement section of the task, they felt they have learned the words effectively enough and they were in a hurry to carry out their regular IT course tasks, otherwise they would enjoy playing the games as they mentioned during the interactions. Few also perceived that the games provided would be much useful for the beginners at school or college who would have leisure time at least in the evening hours which is not a case with them as they got evening tasks to be submitted online meeting their deadlines on a daily basis.

4.4.3.3.2 Fun to learn with flashcards

Flashcards were designed for all the words given in each task and made available for learners’ use. The participants accessed them under every task. They read the definition or the meaning associating it with the picture given. They perceived flashcards as another source of fun driven learning. They felt the pictures and the meanings given on flashcards closer to their day-to-day life. Participant 14 reflected that, *“Just like every other task, i once again had fun knowing new words and their usage with real time pictures and meanings given on the tools.”* As mentioned earlier, few found their interest in learning using flashcards. Participant 36 mentioned that, *“I found flashcards*

as an interesting tool, as it is more fun and easy while learning with pictures.”

While building the flashcards with the pictures and their associated meanings by the researcher, it was viewed that authentic material would do a better job and adapted the pictures and meanings from the open sources which might interest them. When the participants were checked on their reflected views during their semi-structured interviews, they responded on the same lines that the pictures and the words provided on the flashcards were realistic and fun to look at and read. For instance, participant 1 during her interview mentioned that she wouldn't have understood the word “restrain” easily just by reading its meaning and even if she does with some effort, she would have forgotten the word sooner but she could understand the word easily and remembered for a longer time as she said because of the picture that displays something is being restrained.

4.4.3.4 Theme 14: Higher accessibility

The participants perceived that the online learning tools are highly accessible for the learners. The accessibility was viewed in two ways, first in terms of accessing plenty of material to access at one place and second in terms of the feasibility to access them in and out of the classroom. The perceptions are presented under two codes accordingly.

4.4.3.4.1 Plenty of material at one place

In the course of doing the tasks and learning words, the participants have accessed multiple online tools and ample learning material they facilitated. Some of the perceptions of the participants on the availability of

abundant material were presented earlier but the perceptions pertaining to their availability at a common location increasing the accessibility were categorized under this code. Many of the participants commonly perceived that the online tools had diverse learning material at hand when they looked up for a word. Participant 1 in her reflective journals mentioned that, *“The tools provided lot of information on the words and their related words at the same place....”* During her interview, when she was asked to read her reflection and elaborate what made her to reflect that way, she responded that, *“Quizlet provided word meanings and coinciding pictorial representations for better understanding, ‘Learn’ option with MCQs and gap filling activities to learn and get immediate feedback, ‘spell’ option to learn spelling, ‘Test’ option if I wish to test myself and Games to reinforce. They were all accessible on one page. These made me to reflect that, the tools were multifaceted with their material and were easily accessible.”* It implied that she perceived the material available is plenty and easily accessible at one place and she had a choice to make out of what was available. Participant 15 reflected similarly that, *“In a single website, I found the meaning and its other forms easily”* When the participant 10 who had a similar reflection was asked to elaborate on his view, he responded that, *“Your dictionary tool facilitated a platform to look up words, then use thesaurus, find examples, sample sentences and famous quotes from all over the world to read at one place”*. Participant 28 who was a struggling learner with lower language proficiency responded in his interview that, *“The Visuwords tool was very interesting as it displayed all the related words mapped together on the web page and had details on their relation on the left side of the same page”*. Participant 3 after doing his activities reflected

that the tool Wordhippo helped him a lot by presenting many details he needed while doing the tasks given. When he was probed to elaborate on it during his interview, he responded that, *“Wordhippo tool had many columns of information at one place. It included columns for Synonyms, Antonyms, Definitions, Rhyming words, Sentences, Translations and different word forms on the common page. They were easily accessible to read. Also helped to complete the task given.”* These perceptions imply that the online tools were not just the sources of learning material but they were also learner friendly to access.

4.4.3.4.2 Accessible In and out of class

As participants were into their hectic course and as the online tools could be accessed even later for reinforcement, if they couldn't do it immediately after doing the task, they were informed to access the tools in their leisure time. They were also followed over Whatsapp communication and in the succeeding sessions. They were noticed to have practiced it. Their reflections showed that they perceived the online tools to have provided the feasibility to access them any time during or after the class. Participant 7 reflected that, *“The information on the tools was much helpful in not just learning the given words but also other words associated with them. They were accessible during and after the class for further practice.”* When the participant 10 who had a similar reflection was probed to elaborate on the reflection, he responded that, *“The flashcards and the games on Quizlet are a good sources for me to go through or play any time after the session for reinforcement. These days I am accessing them during my leisure time in the evenings and I find it fun.”* Many of the participants have responded similarly

that they got it as a habit to access the tools in their leisure time when interacting with them about the previous tasks during their following sessions. Few participants believed that there is no need to think about portability as the tools could be accessed being anywhere. Participant 1 reflected that, *“It is difficult to carry the hard copy dictionary wherever we go instead accessing the online tools is very easy from any place if we are connected to the network.”* These imply that the participants perceived that the online tools are accessible better, accessible from anywhere and they got habituated to access them beyond the classroom.

4.4.3.5 Theme 15: Time-efficient

Participants perceived that the use of online tools is time-efficient based on their overall experience of doing all the tasks. They viewed that the practice demanded a longer time in the beginning. But later on they got used to the practice and they could conserve a lot of time. Consequently the practice led to quick learning as they perceived. The current theme emerged from the perceptions that were coded into three codes as mentioned below.

4.4.3.5.1 Time consuming to begin

While doing the beginning tasks in the study, participants were observed to take more time to understand the task, learn the words given, use different functionalities available on the online tools to learn and then to reflect on what and how they have learned. Most of the participants viewed that the use of the online tools for vocabulary learning required more time at the beginning when compared to the traditional learning. For instance, when participant 1 during her interview was asked the question, *“Did you feel that*

*the process of learning using the online tools took longer time?” she responded, “Ah... longer time! Hmm... (Thinking) actually No sir. It was appropriate to spend that much time to correctly learn the word”. But it implied that she took some time to think and then say ‘No’. To understand what might have gone through her mind, she was asked a follow up question, “Did you feel that it took longer time at least in the beginning?” Then she responded, “Yes sir, in the beginning I used to take longer time to learn the words, complete the task and reflect. But gradually I got habituated to it and understood how to use the tools quickly. Then the time taken to complete the whole process decreased considerably. And as I said earlier it was appropriate to spend that time to correctly learn the words.” When similar questions were asked to the participants in their interviews, many of them responded the same way that they took longer at the beginning but then later on they were able to manage to learn in a short time. Participant 23 responded the same in his words, *"To be frank I didn't understand these tools and their use at the beginning and it took some inertia ending up sparing more time. But when I got to know their architecture and their use, the amount of time I needed to spend was comparatively very less later on."* Participant 21 during his interview responded on a positive note that, *“If we have to learn something in a new way, we obviously have to invest some hard work and time to get started. Once we get habituated we can practice it in a short time and it would be a helpful approach later on.”* Their perceptions imply that they welcomed the practice though it demanded some extra time at the beginning to get started.*

4.4.3.5.2 Time conserving overtime

As mentioned under the earlier code, participants commonly perceived that the use of the online tools needed more time at the beginning but when they got used to accessing them overtime, they turned out to be the tools to conserve a lot of their time. This view on time conservation was echoed by many participants during their interviews. For instance, participant 35 shared his perceptions on overcoming the beginning phase by mentioning that, *“As I remember, at the beginning every student had a time lag issue. Overtime, we got better aware of the use of these tools and could learn as well as complete the activities in much lesser time”*. Participant 23 also conveyed it this way, *“I agree that using these tools took comparatively more time at the beginning but I felt it is worth to do so because it will take very less time when we access the word next time.”* It implies that the participants perceived the time consumption in a broader view that the extra time invested at the first encounter of the word would save their time at the later instances that they would come across the word. The same participant also conveyed this by continuing to respond that, *“...I felt I was engaged with the information because I learnt much more than what I expected when I looked up a word.”* Many other participants viewed that they saved their time as they learnt more in a shorter time. Participant 31 for instance mentioned that, *“They saved lot of my time because they gave much information about a word instantly.”* Participant 4 during her interview pointed out that online tools have saved a lot of time by mentioning that, *“When I was using the printed dictionaries in the classroom they were taking more time where as these tools were quite quick in giving what I wanted to learn. Time is a precious thing for everyone*

and these tools saved it for me.” Participant 17 responded similarly in different words, *“It was interesting that we can get meaning and usage of any word within fraction of seconds using these tools.”*

Few other participants perceived the tools to be time conservative for waiving the need to browse different resources. For instance, participant 15 viewed that, *“One tool can help to find a lot of information about a word rather than searching in different sources.”* Participant 11 responded similarly using slightly different words, *“It interested me to know different forms of the word and their usage at one place. It avoided searching in multiple resources.”* Few others perceived the tools to be time conservative because they need not to hurry up to learn along with other things to learn during their class hours and instead they could schedule it in their feasible time later on. Participant 9 shared his view that, *“...learning with these tools interested me as they gave an opportunity to learn in my own way, in my leisure time....”* Such responses under the code implied that the online tools were perceived to be time conservative by providing collated material in one go, by bypassing the need to search multiple resources and being flexible with time.

4.4.3.5.3 Quick learning

Having invested some extra time at the beginning, got habituated gradually and then conserved their time, participants perceived that their learning became quicker overall. Participant 25 reflected in one of his later reflective journals that, *“The tools made learning faster and easier and it was different from the earlier practices.”* Participants found tools of their interest

which made their learning faster. The same participant during his interview conveyed it by responding that, *“Your dictionary was quick for me to understand compared with other dictionaries used.”* As presented under some of the earlier codes, learners viewed that the feasibility of accessing much information on a common platform enhanced the pace of their learning. In this respect, participant 26 reflected that, *“The online tools made the task easy to learn the words quickly by providing the related synonyms and also by providing more examples for the usage of the sentences.”* Participant 15 viewed that, *“In a single website, I found the meaning and its other forms easily and in a short time.”* The variety of material available to meet their interests was also believed to increase the pace of learning. Participant 13 reflected that, *“Wide range of online content to reach and learn in our own way gives us to know where we are lagging and provides a scope to learn in our own style, time and speed.”* Few participants perceived the instant help offered by the online tools made a difference in the pace of their learning. Participant 31 as reported earlier conveyed that, *“They saved lot of my time because they gave much information about a word instantly.”* Participant 21 had a similar view in other words, *“Referring more sentences using the word in a very short time and know much about a word use helped to learn quickly.”* These perceptions implied that the online tools facilitated quick learning for the participants.

4.4.3.6 Theme 16: Cost effective

The participants have perceived that the use of the online tools was very much cost effective. Some of them viewed that using the internet was not new for them but using these learning online tools was new and they were glad that the tools were available for free. They also viewed that getting the devices to access the online tools is a one-time investment for autonomous learning. Their perceptions are presented below under two codes accordingly.

4.4.3.6.1 Free/Cheaper

When the participants were questioned on the advantages they noticed in using the online learning tools, most of them came up with a common idea that the tools were available for free. Participant 21 responded that, *“Many people charge money and train on how to use such tools but we were happy to know through this study that we get them for free. I would definitely use these tools going ahead in my classroom or leisure time.”* As the response implies, some of the participants proactively said that they would continue to use the tools going ahead. Participant 5 also responded similarly in this respect by saying that, *“I usually just used Google search to explore a word earlier but I was happy to start using so many other tools available for free that you introduced to do the tasks given sir. I am also using them while reading a novel which I started to read recently.”*

Participant 1 responded that, *“Along with the tools that we used, there are many websites and mobile applications that are available for free to learn Vocabulary, language and also other subjects for free. Accessing such multiple resources in the form of books would be very expensive for us.”*

Whereas accessing the vocabulary information on these tools was free of cost.” When she was asked to comment specifically on vocabulary learning she responded that, *“Coming back to vocabulary learning, one may use multiple tools alternatively based on what information they are looking for and they could do it for free. The online tools avail that opportunity.”* Further, participants viewed that there were also paid versions and were affordable. Participant 18 responded in this respect saying that, *“The tools have provided a lot of information on the words and their related words at the same place. They were free to use and the pro versions if needed had discounted price for students....”* Participant 14 responded similarly that, *“This kind of learning using the online tools was new for me and I was happy to know that they were available free to learn. And sometimes the advanced tool versions were popping up that may cost a bit if we wish to opt.”* It implies that the learners who were new to use the tools also perceived that the tools were affordable in case they needed advanced options on the tools. In line with this view, participant 23 in his interview responded that, *“I used internet earlier but not these tools ever. They are rich in content and cheaper in price”*. Such views imply that the learners perceive the online tools to be either free of cost or cheaper even if they wish to opt for the graded versions.

4.4.3.6.2 One-time investment

In addition to perceiving that the online tools were available for free, participants also viewed that the electronic equipment like laptops or tablets to access the tools would be a prerequisite but it could be addressed as a one time

investment. Participant 18 while responding on the usefulness of the online tools conveyed that, *“The tools provided lot of information on the words and their related words at the same place. They were free to use and the pro versions if needed had discounted price for students. We all just needed a laptop or a smart phone as a onetime cost to use them.”* Participant 1 also viewed that, *“It may be expensive for the government to print text books every year but instead if they could consider to build customized laptops or tabs for the students to learn and print only the essential workbooks it could be a onetime investment.”* Few other participants also perceived the investment of time for raising awareness among the students as a one time investment.

Participant 14 responded on the prerequisite of raising awareness on using the online tools by saying that, *“There could be orientation sessions on the use of these tools from schooling itself by investing some time during the academic year which would also be a onetime investment in terms of time. I understand it is a challenge to implement it in a larger scale but it could be worked out.”*

Moving ahead in this respect, participant 1 shared her perceptions on the possibility of addressing the challenge of lack of awareness. She responded by saying, *“...I see with a required orientation this approach of using online tools could be channelized to a larger section of the students to learn not just vocabulary and language but also subjects in other fields.”*

Chapter 5: Discussion and Conclusion

5.0 Introduction

This study primarily aimed to understand the vocabulary learning strategies used by learners when they learn using online learning tools. And then to understand the learners' perceptions of learning vocabulary online and using online tools in the ICT-facilitated learning environment. The strategies used in such a learning environment are identified as e-Vocabulary learning strategies. A mixed method was adapted for the study to collect the data and carry out the analysis. The current chapter begins with an overview on the data analysis carried out. In the following sections, significant findings derived from the analysis under each question are mentioned, interpreted and discussed concerning the literature in the field. The interpretation and discussion of the findings of the first two research questions are done together as they are interrelated. Then the findings of the third and fourth questions are discussed in a sequence. Thereafter, the implications of the study and limitations of the study are mentioned. In the final section, the scope for further research and the conclusion for the study are included.

5.1 Summary of the Findings

While the findings for the first three research questions were drawn from both the quantitative and qualitative analysis, the findings for the fourth research question were drawn exclusively from qualitative analysis using the thematic analysis technique. The data for the quantitative analysis of the first three research questions were derived from the vocabulary learning strategy questionnaire used in the study. It was used to measure the responses of the participants with a five-point Likert scale. The responses on the scale were scored from 1 to 5 for the five choices given on the scale. The responses received for the first two choices,

“Never true” (1) and *“Usually not true”* (2), were considered negative responses in using a given strategy, whereas the last two choices, *“Usually true”* (4) and *“Almost always true”* (5) were considered positive. The responses for the third choice, *“Somewhat true”* (3), were neither considered negative nor positive for the ambiguity the response carries. In the following sections, the findings of each research question are first mentioned briefly and then discussed in detail.

5.2 Findings for the research question 1

To answer the first research question, “What are the e-vocabulary learning strategies used by ESL learners for learning vocabulary using online learning tools?”, the percentage of positive responses against each strategy was calculated for the pre-intervention and the post-intervention questionnaires. A comparative analysis of the percentages from both questionnaires (See Chart 4.1) has resulted in arriving at some of the critical findings as stated below:

1. There was a significant rise in the total number of e-VLS used by the learners compared to the number of VLS they had used earlier
2. There was a considerable rise in the percentage of use of almost every strategy they employed.
3. There was a paradigm shift in using strategies while using online learning tools; no strategy is left unused.
4. Discovery-Determination strategies were more extensively used after intervention leading to greater learner autonomy

5.3 Findings for research question 2

To answer the second research question, “What are the most and the least frequently used e-vocabulary learning strategies while learning with online learning tools?”, the learners’ strategy priorities are understood with the mean of each strategy used. Comparing the means of all 42 strategies, they were categorized from most frequently used to least used e-VLS. (See Table 4.4) A close observation of the most used, moderately used, and least used strategies have resulted in arriving at some of the essential findings as stated below:

5. The most used e-VLS were found high in number and with higher frequencies compared to the findings in the field
6. The most used e-VLS comprised all the categories except the social strategies
7. Majority of the least used strategies were found to be social strategies
8. The learners have practiced the strategies moving beyond their cultural affinity

5.4 Interpretation and discussion of the findings for research questions 1 and 2

The interpretation and discussion of the findings for research questions 1 and 2 are carried out in a common section, as the second research question is in continuation of the first one. While the pre-intervention questionnaire was used to estimate the vocabulary learning strategies already under learners' use (before participating in the study), the post-intervention questionnaire was used to understand the e-Vocabulary learning strategies learners used while learning with the online tools in the study. To answer the first research question, "What are the e-vocabulary learning strategies used by ESL learners for learning vocabulary using online learning tools?", both the questionnaires were analysed by comparing and contrasting the participants' responses on the use of strategies before and after being a part of the study. It

was done by comparing the responses from two questionnaires because the differences among the responses and the shift in the learners' strategy choices would imply that the changes were due to the intervention through the online tools. In other words, it helped in eliciting the e-VLS used by the learners to answer the research question. Similar studies in the field reported on using e-VLS in an ICT-enhanced language classroom were also scant to compare and analyse. If there had been such studies, the post-intervention questionnaire data could have been related to the findings of the earlier studies and analysed. The discussion for research question 2 is based on the observations made in the study, and the findings of the earlier research in the field carried out in a conventional mode. The findings under research questions 1 and 2 are interpreted as below.

5.4.1 There was a significant rise in the total number of e-VLS used by the learners compared to the number of VLS they had used earlier

As displayed in tables 4.2 and 4.3, there is a massive variation in the usage and range of strategies among learners before and after using online learning tools. Before the intervention, the number of strategies used by approximately 50% and above participants was just 6. The number rose to 34 strategies while learning with online tools, including the earlier six strategies. The numbers indicate that considerably 28 new strategies were brought into their practice as they began learning with the online tools. Overall, the majority of the strategies in the inventory were reported to be used as e-VLS, many of which were hardly found to be used as VLS by the learners in their earlier face-to-face classroom learning.

The rise in the use of strategies partially echoes the findings of Cohen (2000), who says that learners do not master the strategies in an inventory by themselves but would instead need exposure and explicit training to master them. It is true that the rise in the use of the strategies is due to the exposure and training learners got in the study. However, the finding of the study is in partial compliance with such studies because the rise in the use of the number of strategies noticed in such studies (e.g., studies of O'Malley and Chamot, 1990 and Cohen, 2000) is not as high as noticed in the current study. The additional factor that led to the significant rise in the use of strategies could be the use of online learning tools, which was not a factor in the earlier studies. It is because the earlier studies on strategy training were conducted in conventional face-to-face classrooms, and the affordance of integration of ICT tools was not yet as prevalent as it is in contemporary times. It is also evident from the methodology followed in the study that the current study's strategy training emphasised two factors that could impact the use of strategies. First, raising awareness of various strategies, as done in the earlier studies and second, familiarising how to practice the strategies with the help of online tools. The tools became a medium to practice multiple strategies. The medium was not an influencing factor in conventional classrooms, but it was a significant factor in the current study context. It is evident since the online tools have facilitated some of the strategies that could have been difficult to be practiced in a conventional learning setting. To mention specifically, strategies like, "I refer to sentences using the new word" (Strategy # 7), "I listen to and practice the pronunciation of a word" (Strategy # 29), "I learn through fun-filled matching activities" (Strategy # 34), "I test myself with word tests for reinforced learning" (Strategy # 37) etc., whose use significantly increased were much easier to practice on online tools than in conventional classrooms. Such variations

among the use of strategies before and after the use of online tools helped the researcher in identifying the e-VLSs employed by the participants, thereby answering the first research question.

5.4.2 There was a considerable rise in the percentage of use of almost every strategy they had employed.

Apart from the increase in the total number of strategies used, a significant rise in the use of every strategy was also found post intervention (See Chart 4.1). The chart displays the effective use of the strategies after the intervention (indicated by blue bars) by comparing them with their use before the intervention (indicated by orange bars). It demonstrates the difference in using the strategies in conventional settings vs. using them online as e-VLS. Except for the two strategies, noticeably, all other strategies in the inventory have a higher percentage of use in the online mode. The first strategy among the two exceptions, *“I ask other learner for mother tongue translation”* (strategy# 11), was found to have a drop in its use from 30.56% to 16.67%. The second strategy, *“I ask facilitator for mother tongue translation”* (strategy# 12), was found static with 22.22% of use before and after the intervention, as displayed towards the bottom of the Chart 4.1. Except for these two strategies, all the other 40 strategies were found to have a significant rise in their usage as displayed in the chart. The majority of the 40 strategies were found with a paradigm shift in their percentage of use. And some strategies were found with a considerable rise. The rise in the percentage of use ranged from 72.22% to 11.11%. Chart 4.2 explicitly displays the rise in the use of each strategy in the descending order.

When the use of strategies before (See Table 4.2) and after the intervention (See Table 4.3) are closely observed, two inferences could be made. First, all the strategies

found to be used before intervention continued to be used further in the online mode as well. Second, various other strategies which were not used earlier were included in the learners' strategies repertoire. The six strategies that were found to be used considerably by a good number of participants before the intervention were found to be used by an even higher number after the intervention. The first one among the six strategies, "I use English-language media like Web sites, mobile phones content" (Strategy# 36), was used by 72.22% of the participants before the intervention, but it was used by 97.22% of the participants after the intervention. Similarly, the percentages of participants that used the five other strategies before and after the intervention were as follows: "I guess meaning of a word from its context" (Strategy# 1, used by 72.22% and 94.44%), "I look for meaning or the paraphrase of a word in an online dictionary" (Strategy# 2 used by 63.89% and 91.67%), "I think of links between what I already know and the new word knowledge I gain" (Strategy# 16 used by 61.11% and 83.33%), "I connect the word to its synonyms and antonyms" (Strategy# 20 used by 61.11% and 83.33%), and "I paraphrase the word meaning on my own" (Strategy# 27 used by 47.22% and 75%). These findings imply that the learners did not discard any of the strategies they had used earlier in conventional learning when they were learning in the current approach, using the online learning tools. Instead, they used them more extensively with the help of the online tools during the intervention. In other words, the online tools have encouraged the learners to continue using the strategies they were habituated to more rigorously along with the new strategies they used.

Among the strategies that were newly brought into practice, it is noteworthy that some strategies that were hardly used by anyone before the intervention have been used by the majority of the learners post intervention, as displayed in the chart 4.1. For instance, the strategies, "I use online flashcards to know the meaning using the definition

or a picture given" (Strategy# 6), "I use online Semantic maps (group/map of related words) to learn words" (Strategy# 21), "I visualize the flashcards to recall words learnt (Strategy# 32), "I learn words using online tool's feedback" (Strategy# 33) and "Reinforce by playing a word game" (Strategy# 35) were found to be used by a very less percentage of learners prior to the intervention. But post intervention, a majority of the participants were found using them. They were used by just 2.78%, 5.56%, 2.78%, 11.11% and 11.11% before the intervention but later they were used by 75%, 77.78%, 75%, 83.33% and 80.56% of the learners respectively as displayed in the chart 4.1.

The above findings imply that, in addition to continuing with the strategies of their choices in conventional learning, learners have added many more strategies that they never practiced earlier. In other words, the online tools have facilitated both familiar and unfamiliar strategies for the benefit of the learners. In the Indian ESL context and in many other contemporary ESL and EFL contexts too, generally the use of virtual flashcards, use of semantic maps, use of immediate feedback from some source and use of online word games are rarely practised. These findings in the study are contrary to the findings of O'Malley and Chamot (1990), who found that Asians were resistant to strategy training. It is implied in the current study that ESL learners could get accustomed to the use of very new practices of learning vocabulary if they are familiar with the online tools and are made aware to use the e-Vocabulary learning strategies. In addition to the above 5 strategies, there were many other strategies found with a high increase in their use as displayed in chart 4.2.

5.4.3 There was a paradigm shift in using strategies while using online learning tools; no strategy is left unused.

When the strategies used before and after the intervention were analysed, comparing Tables 4.2 and 4.3, there were some significant observations. With reference to the pre-intervention strategies, it is evident from table 4.2 that there were 36 strategies out of a total of 42 strategies in the inventory that were reported to be used by less than 50% of the participants. The participants' usage percentage ranged from 36.11% to 0% moving down the list. Conversely, post intervention, there were only eight strategies that were used by less than 50% of the participants. It ranged from 44.44% to 16.67%. These imply that when the strategies were practiced in their conventional learning contexts, many strategies were used by a very less percentage of the participants, and some of the strategies were used by none of the learners. Whereas, when the strategies were practiced as e-VLS using online tools, there were very few strategies that were used less, and there was hardly any strategy that was unused, as displayed in table 4.3.

The reasons for the paradigm shift are twofold, as viewed earlier. First, the awareness of different strategies has interested the learners in using them. Second, the familiarity raised over online tools and their use has motivated the learners to practice multiple strategies facilitated by the tools. These two views were validated when the findings were corroborated with the learners' reflections collected from the reflective journals and the interview responses. For instance, concerning the learners' interest in using the strategies, participant 18 reflected that "I found learning the words very interesting this way as some of the words are pretty new to me and I have learnt new words and where to use them and in what context." Learners found their interest when they were informed that the words they are already familiar with could also be learnt better using the consolidating strategies that add deeper word knowledge. For example,

Participant 1 reflected on this in the reflective journal by mentioning, "Knowing that already learnt words can also be learnt better is what interested me today." Similar reflections on relearning the familiar words and using online tools for this purpose were observed from many participants in the individual interviews as well. When participant 26, for example, was asked about relearning and the role of online tools, he responded that "The tools not only helped in learning new words but also the partially familiar words like how to use them and in which contexts they are used".

There have been many reflections with specific reference to their motivation in using the online tools and practicing different strategies with the tools. For instance, participant 9 explicitly stated that "Using wordhippo and yourdictionary interested me to refer to find usages of the words in sentences. They helped in understanding words in various contexts and then form my own sentences." When such reflections are critically analysed, apart from revealing the learners' interest, they also uncover different strategies that were facilitated by the tools. The part of the above reflection, "...interested me to refer to find usages of the words in sentences..." imply that the online tools have facilitated the following strategies: "I refer to sentence(s) with the new word (Strategy# 7, a Discovery- Determination strategy), "I refer to more sentences using the word" (Strategy# 19, a Consolidating-Memory strategy). Similarly, the part of the reflection, "...They helped in understanding words in various contexts..." imply that the tools have facilitated different contextual texts and hence the strategies like: "I guess meaning of a word from its context" (Strategy# 1, a Discovery- Determination strategy). Finally, the part of the reflection, "...and then form my own sentences." implies that different context-based usage provided on the tools have led them to practice the following strategies from the inventory: "I use the English words learnt in different ways (Strategy#

31, a Consolidating-Cognitive strategy) and "Use words in a sentence and share in an online group" (Strategy# 41, a Consolidating-Meta-cognitive strategy).

There were many other reflections that imply that the online tools facilitate different e-VLSs. A reflection of participant 7, for example, "Flashcards created interest to learn by looking at the pictures given there and the matching word definitions", imply the facilitation of strategies like learning through imagery, association of word knowledge, and fun-filled learning. Other similar reflections include: "Learning with these tools interested me as they gave an opportunity to learn in my own way, in my leisure time and explore as much as we wish to learn about any word." (Participant 9 on strategies of autonomy), "the tools made learning beyond the classroom more interesting." (Participant 18 on strategy on spaced learning). Another reflection by participant 26, "The thing that I found most interesting while using the online tools was learning with the 'visuwords' platform. While searching for a word in this online platform it generates us the synonym, antonym and also the noun, verb, adjective, and adverb of the given word in a particular animated fashion." Such reflections imply that the strategies of learning words using Synonymy, Antonymy, and parts of speech are facilitated by the tools. Such reflections and interview responses of the participants imply that the interest they got upon knowing the strategies and the motivation they derived on using the online tools have together led them to the paradigm shift of practicing all the strategies possibly facilitated by the online tools and leaving no strategy unused.

5.4.4 Discovery-Determination strategies were more extensively used after intervention leading to greater learner autonomy:

When the strategies were analysed according to the categories, self-reliant strategies such as Discovery-Determination strategies were found to be highly preferred strategies. Discovery-Determination strategies are the strategies that are used by the learners to gain primary word knowledge such as its meaning, pronunciation, spelling etc. by themselves upon encountering a new word. These strategies immensely contribute to learners becoming autonomous in learning vocabulary.

When the pre-intervention strategy use was analysed, there were only 6 strategies that were used by at least 50% and more of the participants. Out of which there were just 2 Discovery-Determination strategies found to be used as shown in table 4.2. In contrast, among the top 6 strategies used by 50% or more of the participants post-intervention, there were 4 such strategies used. The two strategies that were already under use pre-intervention, “I guess meaning of a word from its context” (Strategy# 1 used by 72.22%) and “I look for meaning or the paraphrase of a word in an online dictionary” (Strategy# 2 used by 63.89%) were extensively used by 94.44% and 91.67% of the learners when analysed post-intervention. Similarly the two other strategies, “I refer to sentence(s) with the new word” (Strategy# 7) and “I find the words with similar meaning” (Strategy# 3) that were found to be used by 91.67% and 86.11% post intervention were used by just 27.78% and 36.11% of the learners before participating in the study.

The above observations imply that the use of online learning tools have enhanced self-directed e-Vocabulary learning strategies such as effectively decoding a word from its context, using a more flexible online dictionary for word meanings, exploring words in different available contexts, learning a word with its synonyms etc. Similarly four other

Discovery-Determination strategies in the inventory used pre-intervention, “I observe any pictures given in a text related to the words used” (Strategy# 8 used by 27.78%), “I use online flashcards to know the meaning using the definition or a picture given” (Strategy# 6 used by 2.78%), “I find out the part of the speech of the given word” (Strategy# 4 used by 16.67%) and “I look for related forms of the word noticing their prefixes or suffixes” (Strategy# 5 used by 25%) were also used extensively by 80.56%, 75%, 63% and 50% of the learners respectively post intervention.

5.4.5 The most used e-VLS were found high in number and with higher frequencies compared to the findings in the field:

Out of the 42 strategies in the questionnaire, considerably 21 strategies were found to be the most used e-VLS with the mean ranging from 3.92 to 4.86 out of 5. The number of the most used strategies is 21 as they were categorized in reference to the median, 3.90. The number could have otherwise raised to 31 strategies if they were counted in reference to an average mean of 3.5 which is typically used as a criteria by the studies in the field to identify most used strategies. Instead of including those additional 10 strategies in the most used e-VLS, they were categorized under the moderately used strategies to draw a line between the strategies with the highest mean and the higher mean with reference to the median. However, even if 21 out of 42 strategies in a questionnaire were the most used strategies, it is significantly high compared to the earlier findings in the field. For instance, the number of most used strategies found by Schmitt (1997) in a large-scale study was 10 out of the 58 strategies in his phenomenal taxonomy. In another study conducted by Han (2014) also, the number of most frequently used strategies was found to be 10. The mean of

those strategies ranged from 3.33 to 4.26. The mean of strategies use was found to be high in such studies in the field but comparatively the mean range of strategies use while learning with the online tools as found in the current study was even higher ranging from 3.92 to 4.96.

In another study conducted by Ravi Sheorey (1999) by adopting the strategies from Oxford (1990) as well as Yang (1999), 16 strategies were found to be the most used ones with a mean that ranged from 3.52 to 4.21. It was a study conducted to understand the strategies used by the ESL graduates in Indian colleges. Though the emphasis was on understanding the language learning strategies used, there were vocabulary learning strategies interspersed in the inventory. When compared to the findings of such studies conducted both in EFL and ESL contexts, the current study aligns with them for the fact that there was a rise in the number of the strategies used by the learners post intervention that included strategy training. However, the rise in the number of strategies used and the rise in their frequency of use are higher in the current study. The factors that could influence the choices of the learning strategies and the frequency of their use are diverse. Majorly, the cultural background of the learners and the academic setting in which the strategies are practiced could be influential. Studies conducted by Politzer and McGroarty (1985), Green and Oxford (1995) specifically inform that the educational setting in which second language learning is carried out influences both the choice and the frequency of strategies' use (Sheorey, R., 1999). The academic setting in the current study differs from the earlier studies in that they were conducted in a traditional face-to-face setting whereas the current study was conducted in an ICT enhanced setting. The strategies in a face-to-face setting are generally practiced in a conventional manner whereas in the context

of the current study the use of the online resources to draw abundant word knowledge and the online platforms used for learning have acted as the medium for practicing the strategies innovatively, as e-VLS. Consequently, a higher number of strategies were practiced with higher frequencies as found in the study. Figures 5.1, 5.2 and 5.3 show the strategies that were used by more than 90% of the participants as reported in their post-intervention questionnaire.

Figure 5.1 Percentage of the participants who used the strategy # 36

36) I use English-language media like Web sites, mobile phones content

36 responses

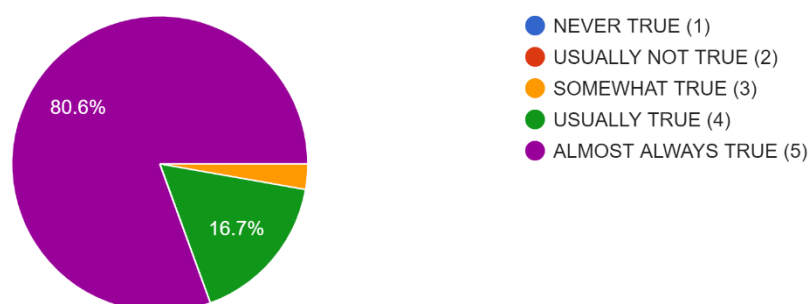


Figure 5.2 Percentage of the participants who used the strategy # 2

2) I look for meaning or the paraphrase of a word in an online dictionary

36 responses

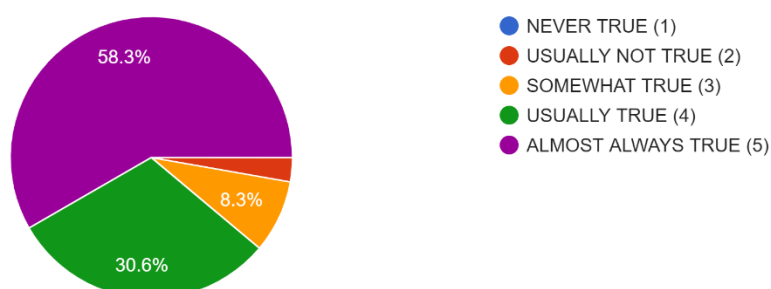
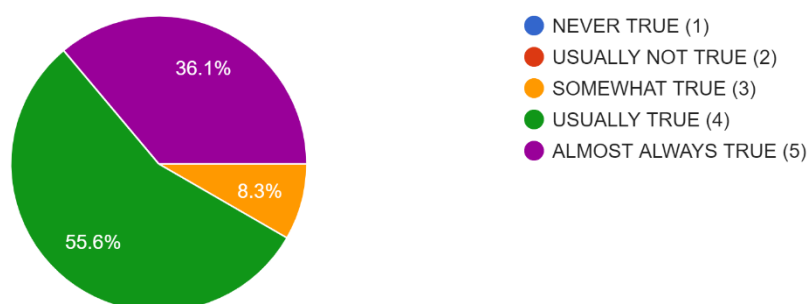


Figure 5.3 Percentage of the participants who used the strategy # 1

1) I guess meaning of a word from its context
36 responses



As shown in figure 5.1, more than 97% of the participants responded positively on using English language media accessible online. This strategy was hardly reported to be of learners' choice in the earlier studies. Similarly, the strategy of looking for the paraphrased meaning or other word knowledge on an online dictionary as shown in figure 5.2 was highly reported in the current study which was rarely reported to be used in earlier studies of conventional classroom learning. As Schmitt found in his study, 85% of the participants used bilingual dictionaries. The use of the online dictionary found in the current study was also higher than the conventional practice of using a bilingual dictionary. While the participants' medium of instruction (English) in the current study could be a prominent reason behind not relying on a bilingual dictionary, the very idea of using a dictionary is noteworthy than using a bilingual or monolingual dictionary in this context. It implies that learners have got accustomed to a high use of dictionary when it is easily accessible and dynamic in use, as in case of an online dictionary. The strategy use displayed in figure 5.3 could also be understood through this perspective. It is because, the strategy of guessing a word meaning from its context has always been learners' choice but in

the context of learning using online tools it was reported to be used even higher. This could be attributed to the additional contextual sentences the learners accessed on the online tools to understand words which were difficult to be decoded from the context of the given text, as learners shared in their reflective journals and interviews mentioned earlier.

5.4.6 The most used e-VLS comprised of all the categories except the social strategies:

Among the 21 most used e-VLS mentioned, there were strategies from all different categories but the social strategies were not found to be a part of the learners' preferred choices as displayed in the table 4.4. To understand category wise from the table, there were 6 Consolidating-Memory strategies (Strategy# in descending order of their frequency: 16, 19, 21, 17, 20 and 18), 6 Consolidating-Cognitive strategies (Strategy# in descending order of their frequency: 29, 27, 34, 33, 35 and 24), 5 Discovery-Determination strategies (Strategy# in descending order of their frequency: 2, 1, 7, 3 and 8) and 4 Consolidating-Meta cognitive strategies (Strategy# in descending order of their frequency: 36, 39, 37 and 40). There were an equal number of memory and cognitive strategies being six in count. Also the two other categories, Discovery-Determination and Consolidating-Memory strategies were used almost equally with the earlier ones being five and four in number respectively. It implies that the learners have actively engaged in using all the types of strategies rather than prioritizing any one or two categories among the strategies. This finding of the study contradicts certain earlier findings in the field. For instance,

Rafik-Galea and Wong (2006) have conducted a study with an adult University learner sample, similar to the current study. Among the cognitive, compensation, metacognitive, memory and social categories that they asked the students to share their preferences, cognitive strategies were the most preferred strategies while the meta-cognitive strategies were the least preferred ones. In another similar study conducted by Gu and Johnson (1996), the students preferred the meta-cognitive strategies. The participants in the current study have practiced all the types of strategies as e-VLS while learning using the online learning tools except the social strategies.

5.4.7 Majority of the least used strategies were found to be social strategies:

There were 11 least used strategies found in the current study. As displayed in the table 4.4, among the 11 strategies 5 were Social strategies that help in discovering the word knowledge (strategy # 14, 10, 9, 11 and 12), 3 were cognitive strategies that are useful to consolidate word knowledge (strategy # 26, 30 and 28), 2 were meta-cognitive strategies which assist in consolidating the word knowledge (strategy # 41 and 38) and 1 memory strategy that helps in consolidating word knowledge (strategy # 23). It implies that the majority of the least used strategies were the social strategies. When the participants were enquired on the low use of the social strategies during their interviews, many of them viewed that they could access all the word knowledge they intended to learn or required to complete the tasks using the online tools. They further added that when they found abundant information online they did not find a need to interact with the peers or the facilitator and therefore did not

practice the social strategies such as asking the other learners or a facilitator for mother tongue translation or for a paraphrase of the target words. The other prominent reason many of the participants responded with was that they were into their hectic IT course schedules. They did not prefer to interact with others but rather do it by themselves to conserve time by using the online tools and completing the tasks.

5.4.8 The learners have practiced the strategies moving beyond their cultural affinity:

As discussed earlier, the cultural background and the academic setting in which the strategies are practiced have a major influence on the kind of the strategies the learners opted for, in both peripheral and deeper strategies. The studies carried out in the field of cognitive psychology evidently inform that deeper rather than a peripheral and a more engaged manipulation of information is demanded for effective learning. Two prominent models on cognition, the forgetting curve model (Ebbinghaus, 1913) and the theory of depth of processing (Craik and Lockhart, 1972) theoretically argue on the significance of such a deeper manipulation while learning vocabulary using the VLS (Gu, 2005). However, the majority of the studies carried out earlier in the ESL field disappointingly reveal that learners usually tend to opt for shallow strategies, which are more mechanical to practice, rather than the deeper learning strategies. To mention a few, Cohen and Aphek (1980) found the most used strategy by the learners to be memorization, O'Malley et al. (1985) identified it to be repetition, Ahmed (1989) found 'note taking' as the priority of the learners. While the use of such shallow strategies is effective in its own way in assisting with the primary

word knowledge, there is a necessity to also use deeper strategies to gain additional word knowledge and retain it for a longer time.

The learners' inclination towards opting for the peripheral strategies is not identified to be an individual factor in the field but it is attributed to their cultural and regional practices. Bedell and Oxford (1996) over reviewing a set of 36 studies that were carried out on cross-cultural variations and the strategies used conveyed that "...learners often, though not always, behave in certain culturally approved and socially encouraged ways as they learn..." Studies conducted in the southern and south-east Asian countries also found that memorization and repetition have been a part of their cultural learning practices for a long time. Such cultural affinity was also noticed among the Indian ESL learners. In the Indian context, Ravi Sheorey (1999) found repetition of pronunciation and memorization of spelling among the most used strategies by the participants in his study.

The findings in the current study partially concur with the earlier findings in the field as the shallow strategies were found to be used by the participants. For instance, the strategies, Memorization and Repetition were noticed to be practiced well with the use of the strategy, "I study and practice spelling of a word" (Strategy# 24), with a high mean of 3.92. However, in divergence with the earlier findings, use of the deeper strategies was also found to be prioritized over the use of shallow strategies in the current study. For instance, deeper strategies such as building associations, imaging, semantic mapping, word usage etc. which were hardly found to

be of any priority for the learners either in the ESL or EFL contexts in the field earlier were noticed to be of higher priority than the shallow strategies in the current study. Use of the strategy, “I think of links between what I already know and the new word knowledge I gain” (Strategy# 16) implies the priority on building associations with a mean of 4.22. Similarly, strategies such as, “I study a word connecting it to a given pictorial representation”, responded in reference to flashcards, (Strategy# 18 with a mean of 3.92), “I use online Semantic maps to learn words” (Strategy# 21 with a mean of 4.11), “I try to use new words in speaking or writing to remember well” (Strategy# 17 with a mean of 4.03) imply the high use of the imaging, semantic mapping and word usage strategies. These findings contradict Sutter’s (1990) study that found learners to be uncomfortable to use these strategies which were not a part of the learners’ cultural learning practices. The ESL participants in the current study besides continuing to practice the traditional strategies, also proactively practiced innovative deeper strategies moving beyond their cultural affinity while learning with the online tools.

5.5 Findings for the research question 3

To answer the research question 3, the percentage of the “A” and “I” group participants (Advanced and Intermediate groups as presented in the results section of research question 3) that used each strategy was analysed (See Table 4.7). When the strategies used by both the groups were compared and contrasted there were many strategies that were found to be similarly used by both the groups. However, there were also differences in the use of the strategies. Some strategies were used with a slight difference and some other strategies with a higher difference. The differences are as below.

1. The high and low proficiency learners have differed in their most used e-VLS but they resembled in their least used e-VLS.
2. The choice of the e-VLS employed by the 'I' group learners implied that they were primarily looking for peripheral word knowledge whereas the 'A' group learners were looking for deeper word knowledge.
3. The e-VLS used by the 'A' group learners indicate a higher level of learner autonomy and self-management while learning.
4. 'I' group learners were found to make use of the scaffolding offered by the online tools more than the high proficiency learners.

5.6. Interpretation and Discussion of RQ3 findings

In order to answer the research question 3, the strategy choices of the high and low proficiency learners were compared and contrasted (See Table 4.7). A close look at the differences among their choices has resulted in some of the prominent findings as discussed below.

5.6.1. While the high and low proficiency learners have differed in their most used e-VLS, they resembled in their least used e-VLS:

When the five most used and the least used e-VLS of the "A" group and the "I" group were closely analysed, their most used e-VLS differed from each other and their least used e-VLS were found to be almost similar. Among all the e-VLS presented in Table 4.7, five most used e-VLS of the high proficiency learners were found to be: "I guess meaning of a word from its context" (Strategy# 1), "I look for meaning or the paraphrase of a word in an online dictionary" (Strategy# 2), "I refer to

sentence(s) with the new word” (Strategy# 7), “I use English-language media like Web sites, mobile phones content” (Strategy# 36) and “I paraphrase the word meaning on my own” (Strategy# 27). Whereas the five most used e-VLS that of the low proficiency learners were: “I listen to and practice the pronunciation of a word” (Strategy# 29), “I use English-language media like Web sites, mobile phones content” (Strategy# 36), “I find the words with similar meaning” (Strategy# 3), “I use online flashcards to know the meaning using the definition or a picture given” (Strategy# 6) and “I learn words using online tool's feedback” (Strategy# 33). Among these, the only common strategy found among them is the strategy# 36 which is about the use of the English language media like that of the web resources, accessible through laptops or the mobile phones. It implies that all the learners were equally comfortable and interested to use the web resources that help them in learning vocabulary. They being the students from an IT course and naturally being tech savvy would have made them more curious to opt for such a strategy. The other four strategies prioritized by the high proficiency learners imply that they were independent learners attempting to gain word knowledge autonomously by decoding the word meaning utilizing the contextual cues, paraphrasing a complex meaning by themselves, proactively use online dictionary when needed, or refer additional sentences to understand the word in different contexts of its use. Whereas the other four strategies used by the low proficiency learners such as drawing pronunciation of the word from the online tools, looking for synonyms, use of flashcards for meaning or definition and making use of feedback given by the online tools imply their dependence on the online tools for assistance and prioritization of the primary word knowledge such as phonological form, meaning, word definition etc. to draw from the online tools.

On the other hand, the “A” and “T” group participants have resembled in the least used strategies which included, “I practice words over a gap in a day” (Strategy# 38), “I maintain a vocabulary notebook” (Strategy# 28) and “I ask other learner for mother tongue translation” (Strategy# 11). Least use of the translation strategies imply that the learners do not rely on mother tongue translation anymore. This might be for different reasons: they grew comfortable learning in English, all of them being learners with English as the medium of instruction since their schooling days; they practiced more autonomous strategies rather than social strategies; they got enough information from the online tools that they did not need to check with others. The other least used strategy was maintaining a vocabulary notebook; this would not have been used as they had never practiced it earlier and did not find it useful when they were learning the words virtually. Another least used strategy of practicing a word over a gap in a day was also not brought into practice as some of them responded in their interviews that they were into hectic IT course schedules that begin early in the morning and last till late in the evening. Some of them liked the idea and thought of practicing it at a later part of the day if they had some leisure time to do so.

5.6.2. The e-VLS used by the 'T' group learners implied that they were primarily looking for peripheral word knowledge, whereas the 'A' group learners were looking for deeper word knowledge:

On a close examination of the e-VLS used by the low and high proficiency learners, apart from finding some commonly used e-VLS, there were also considerable differences with regard to the use of some other e-VLS. For instance, the e-VLS that were extensively used by low proficiency learners, such as “I listen to and

practice the pronunciation of a word” (CCS6 Strategy# 29) and “I study and practice spelling of a word” (CCS1 Strategy# 24) as presented in Table 4.7, implied that the learners have prioritized on learning the phonological and the orthographical forms of the words. And the strategies such as “I find the words with similar meaning” (DDS3, strategy# 3), “I use online flashcards to know the meaning using the definition or a picture given” (DDS6 Strategy# 6), and “I observe any pictures given in a text related to the words used” (DDS8 Strategy# 8) used by the low proficiency learners imply their primary emphasis on drawing meaning either through synonyms, flashcards, or the pictorial representations of the words. Further, heightened use of the strategies “I try to use new words in speaking or writing to remember well” (CMS2, Strategy#17) and “I use flashcards to remember new English words better” (CMS7, Strategy# 22) imply their emphasis on remembering the words better as both strategies are of the memory category and are useful in consolidating word knowledge. These findings are in congruence with the earlier findings of Cohen and Aphek (1980) that the beginners or the low proficiency learners tend to use strategies that fetch peripheral word knowledge. In another view, using such shallow strategies is important for low proficiency learners (Schmitt, 1997) to learn vocabulary. Though the low proficiency learners used these strategies, they did not restrict themselves from using other deeper strategies similar to the high proficiency learners as mentioned earlier. In the context of learning in an ICT-enhanced setting, it implies that though the low proficiency learners have adapted deeper strategies using the online tools they still continued to prioritize strategies that helped with primary word knowledge such as form and meaning.

On the other hand, the high proficiency learners appear to prioritize and extensively use some of the cognitive and meta-cognitive strategies in their learning.

For instance, their use of the strategies “I think myself if I am learning the new words effectively” (CMCS5, Strategy# 40), “I paraphrase the word meaning on my own” (CCS4, Strategy#27), and “I guess meaning of a word from its context” (DDS1, Strategy# 1) imply an approach to evaluate oneself on learning through meta-thinking, paraphrase the complex meaning and decode the deeper word knowledge using their background knowledge. These findings align with the findings of Naiman et al. (1978), in reference to the notion of “good language learners”; they found that high proficiency learners monitor their learning and make necessary adjustments, and cope actively with the cognitive demands while learning. Similarly their use of the strategy “I look for related forms of the word noticing their prefixes or suffixes” (DDS5, Strategy# 5) indicate their quest for the familiar inflections for the root word to unwrap the meaning of the unfamiliar root words they encounter. Some of such cognitive and metacognitive strategies useful in decoding deeper word knowledge were comparatively less used by the low proficiency learners.

5.6.3. The e-VLS used by the “A” group learners indicate a higher level of learner autonomy and self-management while learning.

It was found over the analysis that the e-VLS used by the “A” group learners and their respective preferred strategy categories indicate a higher level of autonomy and self-management while learning vocabulary using the online tools. Three among the five most used e-VLS (DDS1, DDS2 and DDS7) by the “A” group belong to the ‘Discovery-Determination’ category (See Table 4.7). It implies their thrust for discovering word knowledge by their self-inquiry rather than resourcing into others’ expertise. An extensive use of the e-VLS such as DDS1 as mentioned above demands

a higher language competency to decode the contextual linguistic cues and guess the meaning of a difficult word from a given context. Use of the e-VLS like DDS2 would require effective use of the resources such as online dictionaries rather than just look up meaning. And use of the e-VLS like DDS7 would need competence to understand varied use of the words with reference to the context.

When the use of the two other e-VLS CMCS6 and CMCS7 were compared between both the groups, the “A” group participants appeared to be more autonomous learners (See Table 4.7). Use of the strategy CMCS6 implies that they were active to use the target words in sentences of their own and share in their online groups. On the other hand, use of the strategy CMCS7 implies that the “I” group learners have opted to learn the words from that were shared in the online groups. From these two strategies’ use it could be inferred that the group “A” learners were autonomous in learning by themselves, active in contributing to the group and also were learning from the group. Whereas the “I” group learners were active in just learning from the group and remained passive in contributing to the group. These findings are in compliance with the findings of Rubin (1975) who found that the ‘good language learners’ are proactive and have a strong desire to communicate to others.

Some of the e-VLS used extensively by the high proficiency learners such as CCS4 and CMCS5 as seen in the Table 4.7, show that comparatively they are more independent learners than the low proficiency learners. To use the strategy CCS4, a learner usually needs higher language competency to paraphrase and learn by oneself and to use the strategy CMCS5, one would need self-planning and introspection which contribute to independent learning.

5.6.4. “I” group learners were found to make use of the scaffolding offered by the online tools more than the high proficiency learners.

When the e-VLS used by the “A” and “I” group learners were analysed, the e-VLS that facilitate scaffolding using the online tools such as Quizlet that scaffolds with flashcards, Imagery, pronunciation etc. were found to be used more by the “I” group learners. Some of such observations are as below.

5.6.4.1. The flashcard related e-VLS were used more by the “I” group learners:

The e-VLS of using flashcards for learning vocabulary have got familiar to many of the learners in the study by practicing them on the online tool, Quizlet. As seen in Table 4.7, the use of the strategies “I use online flashcards to know the meaning using the definition or a picture given” (DDS6, Strategy# 6), “I use flashcards to remember new English words better” (CMS7, Strategy# 22) and “I visualize the flashcards to recall words learnt” (CCS9, Strategy# 32) is high among the “I” group learners comparatively. Though both the groups made use of flashcards, the “I” group learners drew the learning assistance offered by the flashcards more. This is because the learners found flashcards as a good material to learn words by accessing the definition, meaning, pronunciation and pictorial representations at one place, on each of their flipsides, especially the learners of low proficiency. Some of them mentioned in their reflective journals that the online flashcards were more flexible to use anytime on Quizlet than using them as physical hard copies. Few “I” group learners commonly reflected that the flashcards helped in better recall of the

word meanings by providing the target word on one side and the definition or meaning on the other side.

5.6.4.2. The e-VLS of imagery were used more by the “I” group:

Pictorial representations supplemented with the text or with the flashcards were a rich additional source of information to understand a word. The use of the e-VLS, DDS8 and CMS3 imply that the low proficiency learners have used the pictorial support more in learning a word than the high proficiency learners. With the help of these strategies, a learner could observe a picture given to draw primary meaning and then learn the word meaning by relating it to the given picture for better comprehension. Few learners reflected that they found the pictorial representations of the words in flashcards and the ones adjacent to the reading texts were very interesting and useful.

5.6.4.3. The e-VLS of pronunciation was used more by the “I” group:

For learners who found a word to be new or unfamiliar to its pronunciation, the aural support provided by the online tools greatly scaffolded them to learn its pronunciation accurately and quickly. Extensive use of the e-VLS CCS6 by the low proficiency learners as seen in the Table 4.7, shows clear difference in use of the strategy between both the groups. All the participants in the “I” group have reported to have used the strategy. During the sessions, it was observed that the low proficiency learners often accessed the target words’ pronunciation and practiced asking the researcher to cross check if they pronounced them right. For instance, the word “Pivotal” was familiar to many of the learners in terms of its meaning but they

went wrong with its pronunciation. Some of them uttered the first syllable of the word as /pai/ instead of uttering it as /pi/. They checked the pronunciation from the online dictionary and on the flashcards provided on Quizlet and practiced the right pronunciation during the session. Participant 28 who is under the “I” group shared that he always uttered it as /pai/ till he did the vocabulary activity and found its pronunciation new that day.

5.6.4.4. The fun filled strategies were used more by the “I” group learners:

Fun filled learning has got its echo in the online learning contexts. In the context of the current study, Quizlet facilitated fun-filled learning through a matching activity and a word game, “Gravity”. As shown in the table, the use of the e-VLS CCS11 and CCS12 imply that the low proficiency learners have practiced the fun filled learning more than the high proficiency learners. There is a great shift in using the strategy by the ‘Participant 30’ and few other learners of the “I” group.

5.6.4.5. The “I” group learners practiced the semantic mapping strategy more:

Looking at a relevant semantic map while learning a word adds better inference to the word knowledge by sensitizing the learner to its lexical field. It would be more useful for the learners who find a word unfamiliar or partially familiar because they could learn unfamiliar words by locating them in relation to the familiar words; and learn partially familiar words in relation to the very familiar words that appear in a semantic map. In the current study this was practiced with the semantic

maps displayed on the tool, Visuwords. Use of the strategy CMS6 implies that the low proficiency learners have visualized the semantic maps of the target words available on the tool more when compared to the high proficiency learners (See Table 4.7). Overall, the use of the strategy has undergone a paradigm shift post intervention when compared to its pre-intervention use among both the high and low proficiency learners. However, the low proficiency learners have used it more extensively as they might have found the target words less familiar compared to the high proficiency learners.

5.6.4.6. The self-testing and feedback strategies were used more by the “I” group learners:

One of the activities available on Quizlet was “Test”, which is useful in testing oneself on the words learnt and get feedback wherever one may go wrong; this was found to be used more by the low proficiency learners. As shown in Table 4.7, the use of the e-VLS, CMCS2 and CCS10 imply that the low proficiency learners have used strategies of ‘self-testing’ and ‘learning from the instant feedback’ more than the high proficiency learners. The propensity of the low proficiency learners towards the use of such strategies could be either to carry out further practice or to assess oneself on the efficiency of one’s learning and get automated feedback about the mistakes and refine their learning accordingly. It is because the objective of the “Test” activity is not to assess a learner but to provide further practice and facilitate ‘assessment for learning’ approach. It is evident from the learners’ reflections too. For instance, in reference to the “Learn” option on Quizlet that facilitates further practice, participant 15 reflected that tools like Quizlet gave more practice to learn difficult words better. Similarly with reference to the “Test” option on Quizlet, participant 33 reflected that he enjoyed

testing himself on the Quizlet tool and such new practices on the online tools have helped in repeated learning. This shift in the use of the above mentioned strategies of testing oneself and learning using feedback could in turn be attributed to the use of online tools. The two strategies were used very less by the participants before the intervention but their use increased significantly after the use of the online tools for learning vocabulary during the study. It implies that when the online tools are familiarized to the learners and when they are encouraged to use different word learning strategies, the low proficiency learners would make use of the available strategies of further practice, testing and availing feedback more than the high proficiency learners.

5.7 Findings of the research question 4

Three significant findings emerged under the research question 4, “What are the perceptions of the learners on learning vocabulary online and on the use of online tools?”. They were drawn based on the thematic analysis of the learners’ perceptions on using the online learning tools to learn vocabulary, the analysis of the classroom observations and the interview responses. The findings drawn were in relevance to what they learnt of the words, what processes they used while learning, and what are their perceptions on using the online learning tools. The findings are mentioned below.

1. The learners have learnt peripheral as well as deeper word knowledge ranging it from form and meaning to collocations, homonymy and polysemy.
2. The learners have gone through various word learning processes such as making deeper cognitive decisions, network building, word using, and imaging.

3. The learners perceived the online tools to be highly motivating, readily accessible, time and cost effective to integrate into L2 vocabulary learning.

5.7.1 Interpretation and Discussion of the findings of Research Question 4:

First finding which is in reference to the details of word knowledge learners gained is discussed under section 5.4.1, the processes they underwent while learning under 5.4.2 and their perceptions on using the online tools under 5.4.3. as follows.

5.7.1.1 The learners have learnt peripheral as well as deeper word knowledge ranging it from form and meaning to collocations, homonymy and polysemy:

The themes that emerged as results (briefly presented in the figure 4.1 and elaborated under the section 4.4.2.1.) indicate that the learners had learnt various aspects of word knowledge moving beyond learning form and meaning. As they viewed, their learning ranged from peripheral word knowledge, the word forms (Orthographic and Phonological), word classes, word meanings, synonyms and antonyms to deeper word knowledge such as learning word families, collocations, homonymy and polysemy. Usually, it has been a practice for the majority of the learners in traditional learning to limit themselves to learn word forms and meanings to meet the immediate purpose of knowing a word they come across in a text and move on. Sometimes, learners would have moved beyond learning word form and meaning emphasizing on learning the word usage too. However, taking up initiatives either by the instructors or the learners to learn other deeper vocabulary elements such as word classes, word families, collocations, homonymy and polysemy were rare for

varied reasons. The results of the current study reported through the themes and sub-themes (as shown in figure 4.1 and reported under the section 4.4.2.1.) in the previous chapter, inform that the learners have begun with learning the form and meaning and moved on to learning deeper elements such as contextual word use, collocations, homonymy, polysemy etc. in a continuum of depth of word knowledge.

Concerning learning the word forms, the participants' reflections reported in the results section (4.4.2.1.1) imply that they learnt orthographical and the phonological forms better using the online tools. Specifically the 'Learn' and 'Test' options on Quizlet appear to have helped in learning and relearning the word forms. However, to look at mastering the spelling of words practically, learners could have attained it by practicing a couple of times on a paper as well. Then, it is questionable if the online tool really made a difference; if so, how? and why did learners find it helpful for learning. On the flip side, they (For instance, participants 15 and 33, as mentioned in the results section) acknowledged that the tools gave them more practice, and they enjoyed the new practices of learning on the tools. Based on such perceptions it appears that the learners could have sensed the benefits of learning with a teacher, and of learning in a conventional classroom while learning with the online tools too. The 'Learn' option on the Quizlet usually enables learning by making learners read the definition of a word and type its accurate spelling, similar to a teacher giving them dictation. They might have found it encouraging further when the tool could do it multiple times with the same efficacy and at an individual learner level, which is difficult to be practiced by a teacher for varied reasons. Further, the immediate feedback provided by the tool, which was positive and encouraging even when the learners were wrong, seems to have motivated the learners. Such automated

assistance they received from the tools contributed to fill the gap created by the absence of a teacher.

Similar to learning the written forms, learners also learnt the pronunciation of difficult or ambiguous words like 'Triage', 'Scourge' and 'Vitiate' by listening to them repeatedly. Altogether, the flexibility for repeated learning, the positive feedback every time, the assistance on the oral form, and self-evaluation practices that were missing at an individual level in their traditional learning appear to have made a difference in learning word forms enthusiastically. The findings on repeated learning of the orthographic and phonological forms are in congruence with the findings of Lightbown and Spada (1999). They viewed repetitive learning as one of the most effective vocabulary learning strategies. They found repeated learning to be effective in face-to-face learning, which through the current study, appeared to be effective in learning with the online tools too.

Another element of vocabulary the participants learnt was 'word classes'. Noticeably, the majority of the participants perceived learning word classes as troublesome in their traditional learning. However, it got easier and more interesting while using the online tools. The triangulation of the reflections with the interview responses and the researcher's observations (See section 4.4.2.1.1.2 of the results chapter) affirms that the learners realized the use of online tools to be very effective in this respect and it seems to have shifted their notion on word classes from being additional word knowledge to essential word knowledge.

In addition to learning the word forms and word classes, learners were found to have learnt the word meanings, synonyms, and antonyms using the online tools. Learners continued the traditional practice of using textual context as a primary

source to draw meaning though the online tools could instantly fetch them meaning. And in case of difficulty, they quickly shifted to the online tools for assistance with the meaning or the definition. In either case, they did not pause their learning with the meaning or the definition. Instead, they continued to use the online tools to grasp the meaning in varied contexts as the tools provided multiple authentic sentences to understand a word better rather than sticking to the context in the given text, or the meaning provided by the tools. The learners' views on learning synonyms and using them as anchors to understand difficult words better acknowledges that the synonyms provided by the online tools were of more help in learning the words that were partially or completely unfamiliar to them.

Multiple reflections of the participants on learning synonyms and antonyms (See section 4.4.2.1.2.3) further approve that the learners turned learning them as a part of their current word learning process, which was not in their traditional learning process. They progressed from learning a meaning to learning multiple meanings and multiple words that mean the same as the target words. Therefore, the learners did not comprehend the words just from the word definitions or their meanings provided by the tools but also made use of synonymy and antonymy facilitated by the tools.

As learners do not usually focus on word families while learning vocabulary in the traditional learning practices, the researcher was sceptical if they would be interested in adding them to their learning repertoire. However, learners showed interest in learning word families when they were presented with interconnected semantic maps (See the reflections in section 4.4.2.1.3.1). The online tools provided multiple inflections of the root words formed by affixation. The tool Visuwords, to

mention, displayed the network of words connecting the root words and their inflections. For example, it graphically displayed the word ‘incoherently’, which was a target word in task 4, mapping it with the word ‘coherent’ (root word), ‘coherently’ (by suffixing the root word) and ‘incoherent’ (by prefixing the root word). Such a resultant semantic map of the target word and the other target words in different tasks has sensitised the learners to their respective word families. Learners turned curious not just to know the word but also to explore the word.

It was also found that the participants have learnt collocations. They learnt them in two ways (See section 4.4.2.1.3.2) : Firstly, by noticing the organization of the target words (Ex. Fleet in task 5) in harmony with their neighbouring words in the sample sentences provided on the tools. Secondly, by putting the words into use with the right collocates by forming sentences of their own. These findings imply that the learners could get a rich exposure to the collocations of the target words and be encouraged to put them to use when they learn using the online tools. They confidently shared that they could come out of the limitation of learning collocation from a stipulated context in a given text.

In addition to learning collocations, the learners were found to have learnt homonyms adding to their deeper word knowledge. For example, for the word ‘unwind’ (Task 5), they learnt unrelated meanings and put them to use. It implies that learners have realized different senses some words may signal using the online tools and proactively put them to use. Interestingly, the learners were also found to have learnt polysemy, which they hardly did in their traditional learning, for some of the target words extending their deeper word knowledge. For the words ‘Firm’ and

‘Radical’, they learnt multiple meanings which were unrelated to each other or partially overlapping. The use of the online tools made it easy by displaying such words with multifaceted meanings derived from different domains such as Chemistry, Mathematics, Botany, Linguistics, Political science etc., comprehensively. Visuwords, for instance, displayed multiple meanings for the word ‘Radical’, specifying their disciplines. Notably, learners did not stick to the meanings from their highly familiar fields, ‘Chemistry’ and ‘Mathematics’ but used unfamiliar meanings from the socio-political domain in their sentences.

From the above interpretation and discussion on what the participants have learnt from the words, it could be summarized that they learnt both the primary and secondary word knowledge. In other words, they began with learning peripheral word knowledge- word forms (Orthographic and Phonological), word classes, word meanings, synonyms and antonyms. Considerably, they did not restrict themselves there but got motivated to learn deeper word knowledge- word families, collocations, homonymy, and polysemy. According to the earlier experiences of word learning shared by most participants, they usually googled a word for the meaning when they needed it, and they ended their quest for the word knowledge there. They hardly looked for other details of the words as they did not view them as needed and did not come across the open sources that could fetch them such word knowledge comprehensively. Therefore, this shift towards learning the deeper word knowledge noticed in the current study could be attributed to the need created by the tasks given, the realization of the need of learning holistic word knowledge, the awareness gained of the use of the tools, and the motivation they derived from accessing multiple elements of word knowledge on the online tools. With these, learners have turned autonomous and practiced self-guided learning of holistic word knowledge.

5.7.1.2 The learners have gone through various word learning processes such as making deeper cognitive decisions, network building, word using and Imaging.

The learners were found to have learnt by making deeper cognitive decisions such as analysing the contextual use of target words and putting them to use.

Matching words with their meanings or respective pictures, for instance, as Scott Thornbury believes, are surface-level decisions. Whereas analysing its parts of speech is a deeper decision and putting a word to its use is a further deeper decision in the working memory. The learners have practiced these and continued to build word networks. They built associations between the familiar and unfamiliar words. In addition, they strengthened partially familiar and ambiguous words in their mental lexicon. These imply deeper cognitive decisions that assist one in effective learning.

The learners have learnt the word use both by the exposure to ‘Word use’ and by using the words in their own sentences. They learnt difficult words by repeated learning and the new words by reinforcing their learning. The learners had tried to retrieve the words while doing the tasks given and when they planned to use them in their conversations.

They have practiced ‘Spacing’ by learning at different intervals of time in a day, depending on their feasibility. The learners have learnt by ‘Pacing’ their learning as they quickly finished learning the familiar words and took longer time for unfamiliar ones. They modulated their pace from time to time based on the familiarity and the difficulty level of the words. The learners used ‘Imaging’ by noticing the images facilitated on the flashcards and by visualising the words they learn. Overall,

they underwent different word learning processes to draw peripheral and deeper word knowledge autonomously.

5.7.1.3 The learners perceived the online tools to be motivating, highly accessible, time and cost effective to integrate into L2 vocabulary learning:

The learners perceived that the online interfaces were motivating in nature. They shared their perceptions that inform their eagerness to learn on the online tools. They reflected that the visual interfaces provided to them were helpful. Further, the learners perceived that they practiced an autonomous learning approach. There was a shift noticed in their learning style that differed from the classroom learning. However, they were found to perceive that they need someone to assist them despite having access to the online tools. However, they did not expect help in every aspect of learning but only when they fell in need of some help. Therefore, they perceive they need a mentor rather than a teacher.

The learners were found to practice fun-filled learning in the study. They perceived that they practiced fun-filled learning by playing word games provided on the Quizlet tool and by learning using the flashcards. Further, they perceived that online tools had facilitated higher accessibility. They could access plenty of material in one place and access it in and out of the classroom.

With reference to the duration of time taken while learning using the online tools, the participants perceived that the online tools have been time-efficient. They felt the online tools were time-consuming at the beginning, but over time they got familiarized with them. After familiarizing themselves with how to use them, they could access a lot of information in a shorter time, which gradually turned out to be time conservative.

Overall, they felt that they were learning quickly by using the online tools for vocabulary learning.

The participants perceived that the online tools were cost-effective as well. They reflected that the online tools were either free or cheaper to use. They were quite encouraged as the tools were free without any timeline restrictions. Concerning the devices needed to access the online tools, such as laptops, desktops or smartphones, the learners perceived that it would be a good and one-time investment at an institutional or administrative level to procure and use them for a couple of academic years rather than spending on printing course books every academic year.

5.8 Implications of the Study

5.8.1 Implications of the study for the teachers

1. Teachers may encourage the learners integrate ICT tools with Vocabulary learning. They may adopt the online learning tools used by the learners in the current study or similar tools by exploring online, which could better meet the vocabulary learning needs of their learners. Then, they could raise awareness of the online learning tools, their use and various vocabulary learning strategies the tools could facilitate. Gradually, teachers may encourage the learners to use necessary devices like smartphones or laptops in the classroom if possible or at home to learn vocabulary by practicing various vocabulary learning strategies with the help of the tools. Over time, having familiarized themselves with the online tools and the strategies, they may learn both in the presence and absence of the teacher. Such effective integration of ICT tools with vocabulary learning could increase the vocabulary exposure to the learners and decrease their dependency on the teacher in a crowded classroom.

2. Teachers could design/adopt additional vocabulary learning tasks that may require their learners to practice different vocabulary learning strategies.
3. Learners could be encouraged to practice e-Vocabulary learning strategies using the online tools rather than practicing them as Vocabulary learning strategies in their traditional learning, as the latter practice is a challenge for varied practical reasons.
4. Teachers could work with the positive motive that a greater number of vocabulary learning strategies could be brought into learner's practice with the use of the online learning tools as observed in the current study.
5. Teachers could emphasize using the Discovery-Determination strategies as they could bring in greater learner autonomy among the learners.
6. The most used e-VLS found in the current study could be prioritized to begin using strategies. However, the teacher needs to observe what works better with his/her learners and what does not. Accordingly, the use of the suitable strategies from the most used ones in the study and the rest of the strategies could be encouraged.
7. Teachers may encourage the learners to use all the categories of the strategies equally. However, all learners may not find their interest in using the same strategies. Teachers may give the flexibility for the learners to practice the strategies of their choice.

8. Teachers may encourage the learners to practice social strategies innovatively using the collaborative platforms while learning with the online learning tools.
9. Teachers need to encourage the learners to use strategies beyond their cultural affinity, like the use of mind mapping strategies with an online tool they might not have used in their prevalent learning system.
10. Teachers may gauge the differences in strategy choices among the low and high proficiency learners and encourage them accordingly to use their current choices but with the goal of gradually progressing to use the most effective ones. The high proficiency learners could be encouraged to use more self-guided strategies to attain learner autonomy. The low proficiency learners could be encouraged to use the strategies that could anchor them initially and shift to self-guided strategies to attain learner autonomy gradually.
11. Teachers could encourage the learners to draw deeper word knowledge in addition to the peripheral word knowledge with the use of online learning tools. Teachers could make the learners aware of various word learning processes and encourage them to use them according to the word's difficulty level.

5.8.2 Implications of the study for the Learners

1. Learners may welcome the integration of ICT tools with Vocabulary learning

Learners may implement the use of the online learning tools adapted in the current study or similar ones available online, which may help meet their vocabulary learning needs better than their traditional learning. They need to volunteer to raise their awareness of various online learning tools available for free, their use and the e-VLS they could facilitate. Learners may use smartphones or personal laptops depending on their availability in the classroom or home to learn vocabulary using the e-VLS.

2. Learners need to use the online learning tools to increase their exposure to vocabulary and to extend learning beyond the classroom

With the help of the increased exposure on the tools, they need to begin using the e-VLS as practicing the strategies in their traditional learning was not so feasible for varied practical reasons. They need to do it with the positive motive that through the use of online learning tools, they could practice many more strategies than what they could do without their use as seen by a paradigm shift in the current study.

3. Learner autonomy could be attained by using the e-VLS of their choice

Learners may emphasize the most used e-VLS found in the current study, which include self-guided strategies like the Discovery-Determination strategies to turn themselves into more autonomous learners. They could initially begin with the most used e-VLS if they interest them and gradually try using the rest of the

strategies. They could flexibly choose the strategies of interest among many in the inventory in the process of learning by themselves.

4. Learners need to practice strategies that are also beyond their cultural affinity

Learners could volunteer to go beyond their cultural affinity for certain traditional vocabulary learning strategies and begin to practice less used but cognitively more effective strategies like mind mapping strategies. They were less used because they were difficult to be practiced in traditional learning as found in the earlier studies as that of Nobert Schmitt (2000). But the use of the appropriate online learning tools could address it and such strategies could be readily and effectively practiced as observed in the current study. Learners could also practice the social strategies innovatively using different collaborative platforms while learning with the online tools.

5. Learners need to realize their level of proficiency and switch from discovery strategies to consolidation strategies gradually using the online tools

The low-proficiency learners could initially use the strategies that facilitate them with the primary word knowledge and then gradually shift to self-guided strategies that anchor them in gaining secondary word knowledge autonomously using the online tools. On the other hand, the high-proficiency learners could use more self-guided strategies right from the beginning, as found in the current study, and attain greater learner autonomy.

6. Learners could adopt the online learning tools to draw both the peripheral as well as deeper word knowledge.

7. Learners could volunteer to get aware of the various word learning processes and to use them according to the difficulty level of the word as they see it.

8. Learners need to do away with distancing themselves from the ICT tools in academia

Learners need to work on the stigma of distancing themselves from using ICT tools to learn the language in general and Vocabulary in specific and get acquainted with them. The findings of the current study stand by it. The online tools in the study were found to be perceived as learner-friendly, interesting, fun-filled, time-efficient and cost-effective by the participants in the current study. Interestingly, the participants also come from a point when they faced the same challenge in their initial days of using technology in their academic spaces, but they could address it over time.

5.9 Scope for further research

1. The current study was conducted with an Indian ESL learner sample. The results may vary if the participants are from a different ESL/EFL geographical location. Therefore, similar studies could be carried out with learner samples of different ESL/EFL locations to strengthen the generalization of the findings of the current study.
2. The current study participants were tech-savvy and enrolled in an IT course (MSIT). Further research could be carried out with the learners who may not be familiar with online accessing skills by conducting prior orientation training and making them practice e-VLS. The results of such studies could be compared and contrasted with the findings of the current study.

3. There could be further research by emphasizing the use of online tools, specifically outside the classroom, to practice e-VLS in their leisure time after class hours.
4. The social strategies were found to be the least used strategies in the current study. However, they were underused as the learners were in a hectic IT course and preferred to save time by avoiding interacting with others. Otherwise, the learners might have practiced social strategies innovatively using online platforms and collaborative learning. Further research could be conducted with learners who got leisure time, encouraging learners to practice social strategies innovatively with online tools.

5.10 Conclusion

The current study was conducted to understand the e-Vocabulary learning strategies of ESL learners. Upon raising an awareness on the vocabulary learning strategies well researched in the field and orienting on the use of online learning tools, learners were found to exercise many more strategies than what they were found to have used without the use of online tools in the earlier studies in the field. They were found to use strategies of different categories meeting their vocabulary learning needs at different stages, primary and secondary learning phases. Through such stages, learners were found to draw peripheral as well as deeper word knowledge.

Findings of the study imply that online tools have played a pivotal role in learners practicing their e-VLS in and out of the classroom. The online tools not just provided word knowledge but they also facilitated the learners with reinforcement which helped in longer retention of words. These imply that ESL/EFL learners could be encouraged to use online

tools to learn vocabulary in and beyond the classroom. Such practices would motivate the learners to learn when they are ready to learn in their feasible time and learn autonomously.

The findings of the study support that low proficiency learners could also exercise vocabulary learning strategies similar to the high proficiency learners when they are oriented to how to incorporate them in their vocabulary learning. Therefore, online tools could be used as scaffolding tools for the low proficiency learners in absence of the instructors too. The learners were found proactive in learning primary meaning, practicing and testing themselves using the online tools which in contrast to the conventional learning. Such practices could make learning effective with automated feedback when they go right or wrong while learning.

Based on the current study, it could be inferred that both peripheral and deeper word learning strategies are important in their own way. Therefore, learners need to be encouraged to begin with the strategies of peripheral word learning and gradually shift to the strategies that fetch deeper word knowledge. Learners could be encouraged to use the online tools depending on their learning needs. The instructors could encourage the learners to use the online learning tools by configuring them to their vocabulary learning needs. Such initiatives in the contemporary time would pave a way for effective vocabulary learning in the forthcoming virtual learning era by exercising a variety of e-VLS by the learners, in and out of ESL/EFL classrooms.

References

- Ahmed, M. O. (1989). Vocabulary learning strategies. In P. Meara (Ed.), *Beyond words: Papers from the Annual Meeting of the British Association for Applied Linguistics*. London, UK: Center for Information on Language Teaching and Learning, 3-14.
- Barcroft, J. (2009). Strategies and performance in intentional L2 vocabulary learning. *Language Awareness*, 18, 74-89.
- Bedell, D. A., & Oxford, R. (1996). Cross-cultural comparisons of language learning strategies in the People's Republic of China and other countries. In R. Oxford (Ed.), *Language learning strategies around the world: Cross-cultural perspectives*. Manoa, HI: University of Hawaii Press, 47-60.
- Brown, H. Douglas. (2000). *Principles of Learning and Teaching* (4th ed.). New York: Addison Wesley Longman, Inc.
- Carter, R. (1998). Vocabulary: applied linguistic perspectives (2nd ed.). London: Routledge.
- Chamot, A.U. (1987). The learning strategies of ESL students. In Wenden, A. and Rubin, J. (eds.) *Learner Strategies in Language Learning*. New York: Prentice Hall.
- Chamot, A. U. (2005). Language learning strategy instruction: Current issues and research. *Annual Review of Applied Linguistics*, 25, 112-130.

Chen, M., Tseng, W., & Hsiao, T. (2018). The effectiveness of digital game-based vocabulary learning: A framework-based meta-analysis. *British Journal of Educational Technology*, 49(1), 69-71.

Coady, J., & Huckin, T. (1997). *Second language vocabulary acquisition*. Cambridge, UK: Cambridge University Press.

Cohen, A. D. and Aphek, E. (1980). Retention of second-language vocabulary over time: Investigating the role of mnemonic association. *System* 8, 3: 221-235.

Cohen, A. D. (1998). *Strategies in learning and using a second language*. London: Longman.

Cohen, A. D. (2000). Strategies-based instruction for learners of a second language. *NASSP Bulletin*, 84, 10-18.

Cole, J., & Vanderplank, R. (2016). Comparing autonomous and class-based learners in Brazil: Evidence for the present-day advantages of informal, out-of-class learning. *System*, 61, 31–42.

Cook, L.K. and Mayer, R.E. (1983). Reading Strategies Training for Meaningful Learning from Prose. In Pressley, M. and Levin, J. (eds.) *Cognitive Strategy Research*. New York: Springer Verlag.

Cook, V.J. (2001). *Second language learning and language teaching*. (4th ed. 2008). London: Edward Arnold.

Craik, F.I.M. and Lockhart, R.S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior* 11: 671-84.

Craik, F.I.M. and Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology* 104: 268-84.

Cummins, R., Schwarz, G. (1991). Connectionism, Computation, and Cognition. In: Horgan, T., Tienson, J. (eds) *Connectionism and the Philosophy of Mind. Studies in Cognitive Systems*, vol 9. Springer, Dordrecht. https://doi.org/10.1007/978-94-011-3524-5_3

Dalton, B., & Grisham, D. L. (2011). eVoc strategies: 10 ways to use technology to build vocabulary. *The Reading Teacher*, 64, 306–317.

De Wilde, V., Brysbaert, M., & Eyckmans, J. (2020). Learning English through out-of-school exposure. Which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition*, 23(1), 171–185.

Ebbinghaus, H. (1913). *Memory: A contribution to experimental psychology*. New York, NY: Teachers College, Columbia University.

Ellis, N. (1994). Vocabulary acquisition: The implicit ins and outs of explicit cognitive mediation. *Implicit and explicit learning of languages*, 211-282.

- Fan, M. Y. (2003). Frequency of use, perceived usefulness, and actual usefulness of second language vocabulary strategies: A study of Hong Kong learners. *Modern Language Journal*, 87, 222-241.
- Fitzpatrick, T. (2007). Word association patterns: unpacking the assumptions. *International Journal of Applied Linguistics* 17/3, 319-331.
- Folse, K. (2004). *The Underestimated Importance of Vocabulary in the Foreign Language Classroom*.
- Gómez, M. I., King, G. (2014). Using mind mapping as a method to help ESL/EFL students connect vocabulary and concepts in different contexts. *TRILOGÍA. Ciencia, Tecnología y Sociedad*, 10, 69–85.
- Green, J. M., & Oxford, R. (1995). A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly*, 29, 261-297.
- Gu, Y., & Johnson, R. K. (1996). Vocabulary learning strategies and language learning outcomes. *Language Learning*, 46(4), 643-679.
- Gu, Y. (2005). Vocabulary learning strategies in the Chinese EFL context. Singapore, Singapore: Marshall Cavendish Academic.

Gu, Y. (2010). Learning strategies for vocabulary development. *Reflections on English Language Teaching*, 9, 105-118.

Han, Yi. (2014). Foreign Language Vocabulary Learning Strategies: Patterns of use among college students. Doctoral dissertation, Auburn University.

Hsiao, I. Y. T., Lan, Y.-J., & Kao C.-L., & Li, P. (2017). Visualization Analytics for Second Language Vocabulary Learning in Virtual Worlds. *Educational Technology & Society*, 20 (2), 161–175.

Hsu, C.-K., Hwang, G.-J., Chang, Y.-T., & Chang, C.-K. (2013). Effects of Video Caption Modes on English Listening Comprehension and Vocabulary Acquisition Using Handheld Devices. *Educational Technology & Society*, 16 (1), 403–414.

Hu, M., & Nation, I. S. P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language*, 23, 403–430.

Kojic-Sabo, I., & Lightbown, P. M. (1999). Students' approaches to vocabulary learning and their relationship to success. *The Modern Language Journal*, 83, 176-192.

Kumaravadivelu, B. (2006) Understanding language teaching: from method to postmethod. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Lan, Y.-J. (2013). The Effect of Technology-Supported Co-Sharing on L2 Vocabulary Strategy Development. *Educational Technology & Society*, 16 (4), 1–16.

Laufer, B. (1989). What percentage of text lexis is essential for comprehension? In C. Lauren and M. Nordman (Eds.), *Special language: From humans to thinking machines*. Clevedon, UK: Multilingual Matters. 316–323.

Laufer, B. (1992). How much lexis is necessary for reading comprehension? In H. Béjoint & P. Arnaud (Eds.), *Vocabulary and applied linguistics*. London, UK: Macmillan, 126–132.

Laufer, B. (2000). Task effect on instructed vocabulary learning: The hypothesis of ‘involvement’. In Selected Papers from AILA ’99 Tokyo. Tokyo: Waseda University Press, 47-62.

Lawson, M. J., & Hogben, D. (1996). The vocabulary-learning strategies of foreign language students. *Language Learning*, 46, 101-135.

Lee, J. S. (2019). Informal digital learning of English and second language vocabulary outcomes: Can quantity conquer quality? *British Journal of Educational Technology*, 50(2), 767–778. <http://dx.doi.org/10.1111/bjet.12599>

Lightbown P. & Spada N. M. (2021). *How languages are learned* (Fifth). Oxford University Press.

Liu, X. (2013). Investigation into vocabulary learning strategies by learners of Chinese as a foreign language in United States institutions of higher education. *PhD Dissertation, Boston University*.

Liu, S.-H.-J., Lan, Y.-J., & Ho, C.-Y.-Y. (2014). Exploring the Relationship between Self-Regulated Vocabulary Learning and Web-Based Collaboration. *Educational Technology & Society, 17* (4), 404–419.

Meara, P. (1980). Vocabulary acquisition: A neglected aspect of language learning. *Language Teaching, 13*, 221-246.

Mitchell R. & Myles F. (1998). Second language learning theories. Arnold; Co-published in the U.S.A. by *Oxford University Press*.

Mitchell, R., Myles, F., & Marsden, E. (2013). Second language learning theories. *Routledge*.

Naiman, N., Fröhlich, M., Stern, H.H., and Todesco, A. (1978). *The good language learner*. Research in Education Series 7. Toronto, Ontario: Ontario Institute for Studies in Education.

Nation, I. S. P. (1983). Testing and Teaching Vocabulary. *Guidelines, 5*, 12-25.

Nation, I. S. P. (1990). Teaching and learning vocabulary. New York, NY: *Newbury House*.

Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge, UK: Cambridge University Press.

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review*, 63, 59–82.

Nation, I. S. P. (2013). *Learning vocabulary in another language* (2nd ed.). Cambridge, UK: Cambridge University Press.

National Education Policy 2020 (2020).

https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf, 56-59.

O'Malley, J.M., Chamot, A.U., Stewner-Manzares, G., Kupper, L., and Russo, R.P. (1985). Learning strategies used by beginning and intermediate ESL students. *Language Learning* 35, 1: 21-46.

O'Malley, J.M. and Chamot, A.U. (1990). *Learning Strategies in Second Language Acquisition*. Cambridge: Cambridge University Press.

Online vocabulary learning tools. The online learning tools included in the study were accessed from their websites. 'Quizlet' was accessed from: <https://quizlet.com>. 'Visuwords' interactive lexicon: <https://visuwords.com>. 'Yourdictionary' was accessed at: <https://www.yourdictionary.com>

Ou Yang, F. C., & Wu, W. C. V. (2015). Using Mixed-Modality Learning Strategies via e-Learning for Second Language Vocabulary Acquisition. *Educational Technology & Society*, 18 (3), 309–322.

Oxford, R.L. (1990). *Language Learning Strategies: What Every Teacher Should Know?* Boston: Newbury House.

Oxford, R., & Burry-Stock, J. (1995). Assessing the use of language learning strategies worldwide with the ESL/EFL version of the strategy inventory for language learning (SILL). *System*, 23(1), 1-23.

Oxford, R.L., Crookall, D., Cohen, A., Lavine, R., Nyikos, M., & Sutter, W. (1990). Strategy training for language learners: Six situational case studies and a training model. *Foreign Language Annals*, 23(3), 197-216.

Oxford, R.L., & Schramm, K. (2007). Bridging the gap between psychological and sociocultural perspectives on L2 learner strategies. In Cohen, A. D., & Macaro, E. (Eds.). (2007). *Language learner strategies: Thirty years of research and practice*. Oxford, UK: Oxford University Press.

Peters, E. (2018). The effect of out-of-class exposure to English language media on learners' vocabulary knowledge. *ITL-International Journal of Applied Linguistics*, 169(1), 142–168.

Piccinini, Gualtiero. 2010. The Mind as Neural Software? Understanding Functionalism, Computationalism, and Computational Functionalism. *Philosophy and Phenomenological Research* 81: 269–311

Politzer, R., & McGroarty, M. (1985). An exploratory study of learning behaviors and their relationship to gains in linguistic and communicative competence. *TESOL Quarterly*, 19, 103-123.

Pressley, M., Levin, J.R., Kuiper, N.A., Bryant, S.L., and Michener, S. (1982a). Mnemonic versus nonmnemonic vocabulary-learning strategies: Additional comparisons. *Journal of Educational Psychology* 74: 693-707.

Pressley, M., & McCormick, C.B. (2007). *Child and Adolescent Development for educators*. New York, NY: *The Guilford Press*.

Purpura, J.E. (1994). The role of learner strategies in language learning and testing. Paper given at the Thai TESOL Conference, Bangkok, January, 1994.

Purpura, J. E. (1999). *Learner strategy use and performance on language tests: A structural equation modeling approach* (Vol. 8). Cambridge University Press.

Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review*, 56, 282-308.

Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: An assessment perspective. *Language Learning*, 52, 513-36.

Rafik-Galea, S., & Wong, B. E. (2006). Vocabulary learning strategies among adult foreign language learners. In W. M. Chan, K. W. Chin, & J. T. Suthiwan (Eds.), *Foreign Language Teaching in Asia and Beyond: Current Perspectives and Future Directions* Singapore: Centre for Language Studies, 145-188.

Read, J. (2000). *Assessing vocabulary*. Cambridge, UK: Cambridge University Press.

Richards, J. C. & Renandya, W. (2002). *Methodology in Language Teaching: An Anthology of Current Practice*. Cambridge: Cambridge University Press.

Richards, J. C. & Schmidt, R. (2002). *Dictionary of language teaching and applied linguistics* (3rd Ed.). London: Longman.

Rubin, J. (1975). What the good language learner can teach us. *TESOL Quarterly* 9: 41-51.

Rubin, J. (1981). Study of Cognitive Processes in Second Language Learning1. *Applied linguistics*, 2(2), 117-131.

Schmitt, N. (1997). Vocabulary learning strategies. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 199-227). Cambridge, UK: Cambridge University Press.

Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge, UK: Cambridge University Press.

Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research*, 12, 329–363.

Sheorey, R. (1999). An examination of language learning strategy use in the setting of an indigenized variety of English. *System*, 27, 173-190.

Stern, H.H. (1975). What can we learn from the good language learner? *Canadian Modern Language Review* 31: 304-318.

Stoffer, I. (1995). University Foreign Language Students' Choice of Vocabulary Learning Strategies as Related to Individual Difference variables. *Doctoral Dissertation, the University of Alabama*, Tuscaloosa, Alabama.

Teng, F. (2015). Assessing the relationship between vocabulary learning strategy use and vocabulary knowledge. *PASAA: Journal of Language Teaching and Learning in Thailand*, 49, 39-65.

Thompson, I. (1987). Memory in language learning. In Wenden, A. and Rubin, J. (eds.) *Learner Strategies in Language Learning*. New York: Prentice Hall.

Thornbury S. (2002). *How to teach vocabulary*. Longman.

Tugce, K., Eda, C., Enisa, M. (2016). Perceptions of EFL Learners about Using an Online Tool for Vocabulary Learning in EFL Classrooms: A Pilot Project in Turkey. *Procedia-Social and Behavioral Sciences*, 232, 362-372

Vocabulary tasks' sources. Academic word lists and exercises for vocabulary tasks 1 to 5 were adapted from the website: <https://www.eapfoundation.com/> . Reading exercise for task 6 was adapter from the website:

https://gre.graduateshotline.com/reading_comprehension_practice.html. Reading exercise for task 7 was adapted from 'The Hindu' portal:

<https://www.thehindu.com/opinion/editorial/vanquishing-viruses-on-nobel-prize-for-medicine/article59778769.ece>.

Wang, Yan. (2018). Vocabulary-Learning Strategies of Students Learning Chinese as a Foreign Language in an Intensive-Training Setting. Doctoral Dissertations. 478.

Webb, S. (2015). Extensive viewing: Language learning through watching television. In D. Nunan & J. C. Richards (Eds.), *Language learning beyond the classroom*, Routledge, 159–168.

Wilkins, D. A. (1972). *Linguistics in Language Teaching*. Cambridge: MFT Press.

Yang, N. (1999). The relationship between EFL learners' beliefs and learning strategy use. *System*, 27, 515-535.

Appendix I: Questionnaire used for the study

Questionnaire

Participant's Demographic Information:

- 1. Name of the student:**
- 2. Course :**
- 3. Institution :**
- 4. Gender :**
- 5. Age :**
- 6. Native place :**
- 7. English as medium of instruction from:**
Primary/Secondary/High school/Inter/Graduation/Post graduation
- 8. Number of years of English language exposure so far:**
- 9. Please mention the contexts in which you use English for communication:**
- 10. Graduation details (Course, Specialization and the College):**
- 11. I wish to be a participant with my interest in the study: Yes / No**

Strategy Inventory for Vocabulary Learning (SIVL)

Adapted from

Robert Schmitt's Vocabulary Learning Strategies Questionnaire (1997) and

R.L. Oxford's SILL (Version 7.0 (ESL/EFL) © R. Oxford. 1989)

Directions:

- A. The current questionnaire is to understand different ways of learning vocabulary used by the ESL learners with and without the use of online learning tools.
- B. Dear learners, please respond to each question on a continuum that ranges from 1 to 5 in order to share how true of a statement to you following the details below:
 1. **NEVER OR ALMOST NEVER TRUE OF ME** means that the statement is very rarely true of you.
 2. **USUALLY NOT TRUE OF ME** means that the statement is true less than half the time.
 3. **SOMEWHAT TRUE OF ME** means that the statement is true of you about half the time.
 4. **USUALLY TRUE OF ME** means that the statement is true more than half the time.
 5. **ALWAYS OR ALMOST ALWAYS TRUE OF ME** means that the statement is true of you almost every time.
- C. Think into each statement/question and your past experience before you make your choice.
- D. Do not answer how you think you **should** be, or what **other** people do.
- E. There are no right or wrong answers to these statements.
- F. Please put a cross mark (X) under your choice.
- G. Work as quickly as you can being active and careful.
- H. This usually takes about 15-20 minutes to complete. If you have any questions, please let the resource person know immediately.
- I. A sample question is done for you below:

S.No	Question and its choice	NEVER TRUE	USUALLY NOT TRUE	SOMEWHAT TRUE	USUALLY TRUE	ALMOST ALWAYS TRUE
		1	2	3	4	5
i	I actively choose an online dictionary for learning a word			X		

Note: After reading the above sample question, please wait for the facilitator to give you the prompt to go on to the other questions. When you answer the questions, work carefully but quickly. All the best.

S.No	Question and its choice	1	2	3	4	5
		NEVER TRUE	USUALLY NOT TRUE	SOMEWHAT TRUE	USUALLY TRUE	ALMOST ALWAYS TRUE
Part A						
1	I guess the meaning of a word from its context					
2	I look for the meaning or the paraphrase of a word in an online dictionary					
3	I find the words with similar meaning					
4	I find out the part of the speech of the given word					
5	I look for related forms of the word noticing their prefixes or suffixes					
6	I use online flashcards (cards with a word on one side and the word knowledge on the other)					
7	I refer to sentence(s) with the new word					
8	I observe any pictures given in a text related to the words used	–				
Part B & C						
S.No	Question and its choice	1	2	3	4	5
		NEVER TRUE	USUALLY NOT TRUE	SOMEWHAT TRUE	USUALLY TRUE	ALMOST ALWAYS TRUE
9	I ask other learners for paraphrase or a similar word					
10	I ask the facilitator for a paraphrase or a similar word					
11	I ask other learners for mother tongue translation					
12	I ask the facilitator for mother tongue translation					
13	I discuss the meaning of a word or sentence with other learners					
14	I discuss the meaning of a word or sentence with the facilitator					
15	I study and practice meaning in a group					

Part D						
16	I think of links between what I already know and the new word knowledge I gain					
17	I try to use new words in speaking or writing to remember well					
18	I study a word connecting it to a given pictorial representation					
19	I refer to more sentences using the word					
20	I connect the word to its synonyms and antonyms					
21	I use online Semantic map (group/map of related words) to learn words					
22	I use flashcards to remember new English words					
23	I physically act out new English words					
24	I study and practice the spelling of a word					
25	I say the new word aloud when studying					
26	I remember other forms with suffixes/prefixes learnt					
27	I paraphrase the word's meaning on my own					
Part E						
S.No	Question and its choice	1	2	3	4	5
		NEVER TRUE	USUALLY NOT TRUE	SOMEWHAT TRUE	USUALLY TRUE	ALMOST ALWAYS TRUE
28	I maintain a vocabulary notebook					
29	I listen to and practice the pronunciation of a word					
30	I say or write new English words several times					
31	I use the English words learnt in different ways					
32	I use online flashcards to remember words learnt					
33	I learn words using online tool's feedback					

34	I learn through fun-filled matching activities					
35	Reinforce by playing a word game					
Part F						
S.No	Question and its choice	1	2	3	4	5
		NEVER TRUE	USUALLY NOT TRUE	SOMEWHAT TRUE	USUALLY TRUE	ALMOST ALWAYS TRUE
36	I use English-language media like Web sites, phone apps etc.					
37	I test myself with word tests for reinforced learning					
38	I practice words over a gap in a day					
39	Try to use new words in speaking or writing					
40	I think if I am learning the new words effectively					
41	Use words in a sentence and share in an online group					
42	Learn words from peers in an online group					

Appendix II: Reflective Journal

Reflective Journal on Learning Vocabulary

Name of the student:

Roll No:

Please write down the target words:

--

1. The strategies that I used to learn words today (at the beginning, while & after exploring the word)

- a) I used the following strategies at the beginning to know the primary meaning of the words:

- b) I used the following strategies to gain additional word knowledge:

- c) I used the following strategies for reinforcement and later:

2. **The most difficult words (among the given) and the strategies they were learnt with.**

Difficult words in gaining deeper knowledge	Strategy I employed (briefly mention how)	I understood the word as

3. **The most useful strategies in understanding the words are (briefly mention why they are useful):**

4. **The strategies that were not so useful in understanding the words are (briefly mention why):**

5. **Briefly mention how the online tools helped you in learning words today.**

6. **Share something that interested you/found as an advantage regarding online tools today. Add your overall experience here.**

7. **The difficulty level of the vocabulary and the percentage of the knowledge gained today according to you are (Highlight the applicable ones):**

Level	Very easy	Easy	Challenging	Difficult	Very difficult
Word knowledge gained today	Almost Full	70 to 90%	50 to 70 %	30 to 50 %	< 30 %

Appendix III: Samples of researcher's field notes

Field notes and observations of Task 1:

1. Students were curious to carry out the task given following the instructions.
2. Some of them were proactive in interacting with others and with the researcher to get clarity on words and task given.
3. Some students felt the online tool 'Yourdictionary' has easier definitions and is learning friendly whereas few others still opted to use google search, continuing their usual practice.
4. Few students liked using Quizlet and said the flash cards were new and the games were interesting to play.
5. All the participants have explored different word forms for the given words.
6. It was noticed that they used the target words connecting to their daily life instances in their tasks. Examples:

"We have better placement prospects in IT sector after MSIT" (Using the word 'prospect')

"Our mentors inspect our daily online submissions" (Using the word 'Inspect')

7. Many students found the task and the reflective journal as taking longer time than they expected to be.
8. As a measure, they felt it would be more accommodative if the number of words per session can be five instead of eight in order to do all the tasks given.
9. The students felt the reflective journal is little longer and the number of questions can be brought down.

10. Then it was thought that they may take some time to get used to the online approach over the following tasks and could manage withing the time given.
11. So, they would be observed for one more task if they still face the issue.
12. Then, if required, few questions would be combined or eliminated which could also be explored during their interviews. (Contemplated on the issue)
13. Need to rethink on the changes required and discuss with the research guide.

Field notes and observations of task 2:

1. The participants eagerly read the text on the Alternative power resources, which was a continuation of the previous task's text.
2. They started doing the task following the instructions.
3. They were reminded to interact among themselves and with the researcher to get clarity on the words needed. However, there were very few who discussed it.
4. Many participants shared that they are curious to explore some words with the word maps on Visuwords.
5. Though learners used the online tools familiarised as a part of the study, some participants continued to use google search to know word meanings still.
6. For additional knowledge, they shifted to access online learning tools.
7. Quizlet was extensively used for reinforcement. The flashcards and the quiz built on Quizlet were highly prioritised over the other choices.
8. Few who had feasible time today attempted to play the games out of their interest.

9. It was observed that very few practiced spellings and carried out word repetition. May be the words were familiar to the rest of the participants. The words chosen for the initial vocabulary tasks, like the current task, were purposefully kept less challenging for the learners to get used to the online approach. The difficulty level of the words was gradually raised over the tasks.
10. A few students shared that the words for the day are high in number and time-consuming.
11. As a measure, they felt it would be more accommodating if the number of words per session could be five instead of eight to complete the task in time. (It was discussed with the research guide, and the number of words would be reduced in the following tasks).
12. The students felt the open-ended reflective journal was taking longer time. The scope of questions could be considered to be reduced in the following tasks so that any missing information could be collected during their interviews.
13. Review the changes required and check with the research guide on the changes.
(Discussed with the guide and brought in required changes.)
14. The participants explored different word forms for the given words and submitted the task in their google classroom.
15. Learners used authentic sentences for learning.

Examples:

“We decided to curtail the event because people began to leave early.”

“There was a dramatic increase in the prices recently.”

Observations and field notes of task 3:

1. Participants appeared very comfortable with the use of online learning tools.
2. They began to learn the words proactively and chose more words to learn.
3. They have explored different word forms for the given words. For the unfamiliar words, they listened to their pronunciation and learn.
4. While the number words to learn were brought down to a minimum of five based on learners' feedback in the initial tasks, they could gradually get used to the online approach and increased their pace of learning. Consequently, they began to choose more than five words over the tasks.
5. Similar to the earlier tasks, they were reminded to interact with their peers and with the facilitator to get clarity on words needed but there were very few who opted for it.
6. When probed on the reasons for the lack of interactions, many responded that they were getting all the required information on the online tools provided. They shifted to interaction only when they felt it was essential. Otherwise, they were comfortable learning using the available learning tools online.
7. Many participants shared that they are curious to explore some of the words with their word maps on Visuwords.
8. Over the tasks, the use of google search engine for knowing word meanings got gradually replaced by searching the words on online dictionaries and other tools.
9. Many participants mentioned that for every word they first checked in 'Your dictionary', then get an idea on other forms of the word. Then they saw the synonyms and referred sentences.
10. The learners went through different sentences given on the online dictionaries to guess the word meanings from the contexts during the sessions.

11. In case of any difficulty faced with a sentence, they shifted to next sentences given.

This continued till they found a sentence of their comfort to elicit meaning. In such ways, learners actively used guessing and paraphrasing skills and learnt meanings.

12. Quizlet was extensively used for reinforcement. The flash cards and the quiz built on Quizlet were of high priority over the other choices.

13. Few who had feasible time today attempted to play the ‘Gravity’ game out of their interest.

14. Learners continued to use authentic sentences while learning.

Examples:

“The physicist did his best to explicate the wave theory of light for the audience of laymen.”

“The computer has introduced radical innovations”

Observations and field notes of task 6:

1. Participants were observed to be interested in using English language media like language learning websites, online dictionaries and platforms like Quizlet. (Many participants shared the same in their earlier reflective journals too.
2. They showed their interest in knowing the meaning by relating the pictorial representations of the words provided in online dictionaries and flashcards (built on Quizlet for their learning).

3. The learners showed their interest in using the language learning websites, mind mapping sites, multiple online dictionaries and Quizlet (for reinforcement and fun-filled game-based learning).
4. They were eager to improve their word knowledge using multiple sentences in the online dictionaries. They used the sentences as rich sources of context to draw different senses a word conveys in respective contexts.
5. Along with the sentences, the learners were found to have read some of the quotes facilitated by the tools to familiarize themselves with the variety of contexts of word use.
6. They were then interested in looking at multiple words that mean the same as the target word.
7. They showed their interest in using semantic maps of the target words of the day on 'Visuwords'. They related the target words to their surrounding words in their lexical fields visible on the platform.
8. For difficult words, they practiced spelling activities on Quizlet, and tried to test themselves using the test option provided.
9. Practiced spelling and matching activities for reinforced learning.
10. The learners carried out fun-filled learning by playing the Gravity game.
11. Few learners said they remembered the pictorial representations to retrieve the meaning learnt.
12. The learners were invited to initiate a discussion on any difficult word with the researcher or among the learners at the beginning of the task, then while doing the task and at the end (reinforcement time) too. There were hardly any participants who took the opportunity to discuss.

13. When questioned on the reasons for the lack of interactions with the researcher and the peer group, many responded by mentioning that they were getting all the required information on the online tools provided. They shifted to interaction only when they felt it was essential. Otherwise, they were comfortable learning using the available learning tools online.
14. They were reminded to form their own sentences and submit the task without fail. They did it and submitted the task in their google classroom.
15. After the completion of the vocabulary activity, the participants were enquired how did they find using the tools. Most of them responded that they enjoyed learning words using the tools.
16. They mentioned that they were accessing the tools sometime after the class also to reinforce the difficult words and words of their interest.
17. They said they could extend learning after the class as the tools were easy to access anytime, they were free and wherever.
18. They responded by saying that the supplementary visuals were helpful, more importantly, the ones offered by 'Visuwords' and 'Quizlet'.
19. While the 'Intermediate' language proficiency learners spoke of the tools to be very helpful in learning all the words given, the 'Advanced' language proficiency learners responded a little differently. They viewed that the tools were of use specifically to learn difficult words.

Appendix IV: Main questions and sub questions used for a participant's semi-structured interview

Participant's Semi-structured interview

- 1. Was the practice of using online tools helpful in learning vocabulary? How?**
- 2. What are your perceptions on using online learning tools for vocabulary learning compared to usual classroom resources? You may refer to any specific tool you used or a combination of them.**

Note: In the reflective journal III and in the following reflective journals, participant 1 had reflected as below. Let the participant elaborate on the reflections.

Quizlet.com is helpful to learn words with pictorial representations.

yourdictionary.com is handy to check for the word in a sentence

visuwords.com for the related words.

wordhippo.com helped me gather all the word forms.

Merriam Webster was handy for checking the meanings of the words.

- 3. Could you remember the words better when you learnt them using the online tools? Also elaborate on your reflections mentioned earlier.**

Reflections of the participant:

“online flashcards and playing the game, which will make us remember for a long time.”

“Online Flashcards are helpful to relate the word with a picture and remember it longer.”

- 4. Were they helpful in learning new words or partially familiar words or both? Also elaborate on your earlier reflections.**

Reflections of the participant:

“Knowing that already learnt words can also be learnt better using the mentioned tools and techniques is what interested me today.”

“Even the hard words are easy to understand as we are going through the synonyms.”

5. How were online dictionaries helpful to you when compared to printed dictionaries that have been under use? Elaborate on your reflections.

Note: Focus on your recent views and experiences of learning vocabulary.

Reflections of the participant:

“They helped me to learn the pronunciation, similar words, different word forms and meaning.”

“First, I started knowing the meanings of words by checking the online dictionary. Then, I practised using online flashcards and by mapping the words. Later On, knowing the usage of words in sentences helped me to understand.”

Follow up questions:

5.1 Did you like something about using Visuwords?

5.2 What did you feel about the time factor while learning with online dictionaries?

6. What are the major advantages/disadvantages of using online learning tools for vocabulary learning?

Sub questions:

For example Yourdictionary or word hippo, were they taking more time?

Did the tools encourage you to look for more words around? Any example?

7. Did you learn words this way earlier, or is it a new way of learning for you? Is it better? How or how not?

Sub questions:

What is your view on the role of facilitator in this approach? Do you find any gap?

Are you comfortable learning this way by integrating online tools with language classroom or prefer the usual classroom mode?

Through this approach, was it essential word knowledge or the excess word knowledge you feel you gained?

Elaborate on your reflections:

“Support and help from the facilitator and the peers were helpful.”

“They helped me to learn the pronunciation, similar words, different word forms and meaning.”

8. Can the approach be useful to current and future language learners? If yes, from what level is it appropriate for the students to begin it in your view? Why?

Note:

- i. You may comment by taking your earlier learning experiences. Think of the contexts you are aware of and the approaches used. Share your suggestions, if any.
- ii. You may also relate how it would help you in better learning now and ahead.

Thank you for your responses and for being a part of the study.

Appendix V: Tasks used for the study

Task 1

- A. Read the passage given below. Notice the highlighted words in the text and explore them as instructed in the following sections.

Nuclear power is a two-edged sword. It provides relatively cheap power without the immediate air pollution problems that result from oil and coal use. However, it brings



with its long term environmental pollution risks. It is the **predominant** (1) form of power in France, yet in other countries like Australia and New Zealand, it isn't used at all and there's little **prospect** (2) of it being used in the future. There is not much that could **induce** (3) Australia to use it. Even with guarantees of high standards and regular **inspections** (4), there is **intense** (5) and **widespread** (6) opposition **thereby** (7) unlikely that the government will **abandon** (8) its dependence on coal and turn instead to nuclear power.

- B. Please rate the words given from 1 to 5 based on the scale details given below and then go with the instructions to do the task. Place an "X" in the respective cell to indicate your choice. As informed, the rating includes below options:

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word well and I use it.

Word No.	Word	1	2	3	4	5
1	Predominant					
2	Prospect					
3	Induce					
4	Inspection					
5	Intense					
6	Widespread					
7	Thereby					
8	Abandon					

- C. Complete the below table with the common forms of the given academic words. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/> and Visuwords at <https://visuwords.com/>. You could leave wherever an “X” mark is placed as not applicable.

Noun	Verb	Adjective	Adverb
	Predominate	X	
Prospect			X
			Inductively
	Inspect		X
	X	Intense	
X	X	Widespread	X
X	X	Thereby	X
Abandon			X

- D. For each word listed below, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence. First one is done for you.

- 1) Prospect 2) Thereby 3) Inspection 4) Intense
5) Induce 6) Abandon 7) Predominant 8) Widespread

- Word: Prospect
Meaning: A possibility
Part of speech 1, (noun): It is a great career with good promotion prospects.
Part of speech 2, (verb): The CEO of the company prospected a better turnover this quarter.
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

5. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
6. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
7. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
8. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

E. Learn the words further by practicing them on the online learning tool, Quizlet accessible at https://quizlet.com/in/414040227/krishna_awl-sublist-8-with-pictures-flash-cards/.

Task 2

- A. Read the text given and attempt to fill the blanks with appropriate words given in the box. Explore them further to gain deeper word knowledge in the following sections. You will be given the key by the facilitator after doing it.**

restored	dramatic	detected	consistent	accumulates
curtail	chart	chief	abandoned	guidelines

One problem with nuclear power is that it causes extremely dangerous waste that continues to be _____(1) in the environment for many years. As the waste _____(2) the danger increases. There is no safe way of disposing of the waste. In the past it has been thrown in the ocean or buried underground, but it has leaked from both of these locations causing massive sea and land pollution. There is talk about sending it out into space in vehicles which will either circle the earth forever or head off into the endless universe. Another issue for nuclear power is the problem of accidents. Even with strict controls and every power plant using the _____(3) procedures that _____(4) danger, we know that accidents occur and once they happen the environment cannot be _____(5) back to a safe condition for perhaps thousands of years.

We all remember the Chernobyl nuclear disaster of 1986 in Russia where many people lost their lives and many more were seriously injured or developed terminal illnesses when there was an explosion at a power plant. In addition, many hundreds of kilometres of land were contaminated and had to be _____(6). Food crops throughout Europe were affected. We remember the minor accidents in Japan that nonetheless caused _____(7) evacuations of large areas. We know that even when _____(8) are strictly followed, serious danger exists.

Nuclear power certainly brings with it substantial problems. However, it is not alone. Oil and coal also have problems. Brown coal in particular is a significant contributor to air pollution. In fact, we can _____(9) the rise in environmental air pollution with the rise of coal use in the colder winter months in many countries when coal is the _____(10) used fuel for heating.

- B. Please rate the words given from 1 to 5 based on the scale details given below and then go with the instructions to do the task. Place an “X” in the respective cell to indicate your choice. As informed, the rating includes below options:**

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word very well and how to put it to use.

Word No.	Word	1	2	3	4	5
1	restored					
2	curtail					
3	detect					
4	consistent					
5	accumulates					
6	guidelines					
7	chiefly					
8	abandoned					
9	chart					
10	dramatic					

C. Complete the below table with the common forms of the given academic words. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/> and Visuwords at <https://visuwords.com/>.

Noun	Verb	Adjective	Adverb
	restore		
	curtail		
	detect		
		consistent	
	accumulate		
guidelines			
			chiefly
		abandoned	
chart			
		dramatic	

D. For any five words listed below, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence. A sample one is done for you.

restored dramatic detect consistent accumulates

curtail chart chiefly abandoned guidelines

Sample:

Word: Detect

Meaning: Uncover

Part of speech 1, (noun): The detectives assigned to trace the root causes of COVID-19 are keen on breaking its origin mystery.

Part of speech 2, (adjective): It is always fascinating to watch detective movies.

1. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

2. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

3. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

4. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

5. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

E. Carry out further practice and fun filled reinforcement on Quizlet using the below link: https://quizlet.com/_8fcns0?x=1qqt&i=1ual0u

Task 3

A. Please read the text given and attempt to fill the blanks with appropriate words given in the box. Explore them further to gain deeper word knowledge in the following sections. You will be given the key by the facilitator after doing it.

explicate pivotal contradictory radical biased



Even the more natural sources of power generation, such as hydro or water power, are responsible for environmental problems. Consider the beautiful forested valleys and villages that have been permanently flooded in the process of building dams to generate hydro powered electricity in China and Tasmania.

Research into power sources is _____ (1). It doesn't _____ (2) the issue as research is often funded by groups that want to see a specific outcome. The research can be _____ (3) and findings can be unreliable.

So, what is the answer to this _____ (4) question of how we can supply cheap, clean electricity to the world's population? It seems that nuclear, oil, coal and hydro power all come with problems, but presently there are few answers. We need some _____ (5) new solutions.

B. Please rate the words given from 1 to 5 based on the scale details given below and then go with the instructions to start the task. Place an "X" in the respective cell to indicate your choice. As you know, the rating includes below options:

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word well and I use it.

Word No.	Word	1	2	3	4	5
1	explicate					
2	pivotal					
3	contradictory					
4	radical					
5	biased					

- C. Complete the below table with the common forms of the given academic words. You could explore them on the online learning tools, Quizlet at <https://quizlet.com/8fcns0?x=1qqt&i=1ual0u>, Yourdictionary at <https://www.yourdictionary.com/> and Visuwords at <https://visuwords.com/>.

Noun	Verb	Adjective	Adverb
	explicate		
			Pivotaly
		contradictory	
radical			
	bias		

- D. For each word listed below, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence. A sample one is done for you.

1) explicate 2) pivotal 3) contradictory 4) radical 5) bias

Sample:

Word: Prospect

Meaning: A possibility

Part of speech 1, (noun): It is a great career with good promotion prospects.

Part of speech 2, (verb): The CEO of the company prospected a better turnover this quarter.

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

3. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

4. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

5. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

E. Carry out further practice and fun filled reinforcement on Quizlet using the below link:

https://quizlet.com/_8fcns0?x=1qqt&i=1ual0u

Task 4

A. Please read the text given and attempt to fill the blanks with appropriate words given in the box. Explore them further to gain deeper word knowledge in the following sections. You will be given the key by the facilitator after doing it.

commenced bulk incoherently span instigated

I was heading off to Italy for my holidays. After a two-hour delay boarding finally_____ (1) at 9am. It was the worst flight ever. Children in front of me and behind me were screaming for the entire 8 hour _____! (2). It _____ (3) the most awful headache.



I tried to watch a movie, but the _____ (4) of the playlist was horror movies. I hate horror movies. Anyway, I started watching an historical drama set in England in 1850. Then the guy in the seat in front of me decided to put his seat all the way back. That meant that the TV screen was about 5cm away from my face, so I couldn't see. I asked him to put the seat up a bit, but he became angry and started yelling _____ (5).

B. Please rate the words given from 1 to 5 based on the scale details given below and then go with the instructions to start the task. Place an "X" in the respective cell to indicate your choice. As you know, the rating includes below options:

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word well and I use it

Word No.	Word	1	2	3	4	5
1	commence					
2	bulk					
3	incoherent					
4	span					
5	instigate					

- C. Complete the below table with the common forms of the given academic words. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/> and Visuwords at <https://visuwords.com/>.

Noun	Verb	Adjective	Adverb
	commence		
bulk			
		incoherent	
span			
	instigate		

- D. For each word listed below, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence. A sample one is done for you.

1) Commence 2) bulk 3) incoherent 4) span 5) instigate

1. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

2. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

3. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

4. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

5. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- E. Carry out further practice and fun filled reinforcement on the tool, Quizlet using the below link:

https://quizlet.com/in/509555519/krishna_vocabulary_reinforcement_set_4

Task 5

- A. Please read through the text given and attempt to fill the words contextually. Explore them further to gain deeper word knowledge.**

Fleeting unwind scenario restrained firmly



It was one of my worst flight experiences ever. I put my seat back, but the kid behind me started grabbing my hair and pulling it; so, I had to put my seat up again. I was forced to sit _____ (1) in my seat because there was no space for me to _____ (2). I wanted to jump up and down and start yelling at the kids, at the man in front of me, at the kids' parents and at the flight crew, but I _____ (3) myself. I figured that this particularly unpleasant _____ (4) was just _____ (5). It would soon be over.

- B. Please rate the words given from 1 to 5 based on the scale details given below and then go with the instructions to start the task. Place an "X" in the respective cell to indicate your choice. As you know, the rating includes below options:**

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word well and I use it

Word No.	Word	1	2	3	4	5
1	fleet					
2	unwind					
3	scenario					
4	restrain					
5	firm					

- C. Explore the above words for their basic information using flashcards on Quizlet at https://quizlet.com/_8xuvy4?x=1jgt&i=1ual0u . Then complete the below table with the common forms of the given academic words. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/> and Visuwords at <https://visuwords.com/>.

Noun	Verb	Adjective	Adverb
fleet		fleeting	
	unwind		
scenario			
	restrain		
		firm	firmly

- D. For each word listed below, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence. A sample one is done for you.

1) fleet/fleeting 2) unwind 3) scenario 4) restrained 5) firm

1. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

2. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

3. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

4. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

5. Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- E. Carry out further practice and fun filled reinforcement on Quizlet using the below link: https://quizlet.com/_8xuvy4?x=1jgt&i=1ual0u

Task 6

- A. Read the passage given below. Notice the highlighted words and pick the ones that you are not familiar/partially familiar with (pick at least five) and explore them as instructed in the below activities.**

I tend, as a reader, to prize and admire clarity, precision, plainness, **lucidity**, and the sort of magical compression that enriches instead of **vitiates**. Someone's ability to write this way, especially in nonfiction, fills me with **envy**, and **awe**. That might help explain why a fair number of Best American Essay pieces tend to be short, **terse**, and informal in usage/syntax. Readers who enjoy **noodling** about genre might welcome the news that several of this year's Best Essays are arguably more like **causeries** or **propos** than like essays per se, although one could counter argue that these pieces tend, in their essential **pithiness**, to be closer to what's historically been meant by 'essay.' Personally, I find taxonomic arguments like this dull and irrelevant. What does seem relevant is to assure you that none of the shorter essays in the collection were included merely because they were short. **Limpidity**, compactness, and an absence of verbal methane were simply part of what made these pieces valuable; and I think I tried, as the Decider, to use overall value as the prime **triage** - and filtering mechanism in selecting this year's top essays.

- B. Please mention the five words picked in the respective column and rate them from 1 to 5 based on the scale details given below and then go with the instructions to start the task. Place an “X” in the respective cell to indicate your choice. As you know, the rating includes below options:**

1. I hardly know the word.
2. I just know the word by its form (how it looks/sounds) but don't know the meaning.
3. I know both the form and meaning of the word.
4. I know the form and meaning of the word but hardly used it.
5. I know the word well and I use it

Word No.	Word	1	2	3	4	5
1						
2						
3						
4						
5						

- C. Explore the above words for their basic information such as common forms, meaning, parts of speech etc. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/>, Wordhippo at <https://www.wordhippo.com/>, Visuwords at <https://visuwords.com/>, using flashcards on Quizlet at https://quizlet.com/_90wirk?x=1jqt&i=1ual0u or any**

other online resource used earlier. Then complete the below table with different forms of the words.

Noun	Verb	Adjective	Adverb

D. For each word listed above, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence.

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

E. Carry out further practice and fun filled reinforcement on Quizlet using the below link: https://quizlet.com/_8xuvy4?x=1jqt&i=1ual0u

Task 7

- A. Read the passage given below noticing the highlighted words and pick the words that you are not familiar/partially familiar with from them (pick at least three to five) and explore them as instructed in the activities given thereafter.

Vanquishing viruses: On Nobel Prize for Medicine

The Nobel Prize for Medicine is an inspiration to researchers working on SARS-CoV-2

At a time when the world is faced with multiple **assaults** from a frighteningly **obscure** virus, it cannot be mere coincidence that the Nobel Committee decided to **anoint** three scientists who peeled the layers off another virus that confounded generations of physicians — the Hepatitis C virus (HCV). The 2020 Nobel Prize in Physiology or Medicine, to Harvey J. Alter, Michael Houghton and Charles M. Rice, is a **stout** endorsement of years of work that went towards identifying one of the world's greatest **scourges**. But to see it **shorn** of the context it is **couched** in would be to miss the larger point or purpose it could serve. Choosing researchers who went after a **pathogen**, and succeeded in unwrapping the whole puzzle at a time when others are fighting **fatigue** in a daily battle against the SARS-CoV-2 virus, is also a **hat tip** to the virologists and geneticists burning the midnight oil, for couple of months now.

- B. Please mention the words in the respective column and rate them from 1 to 5 based on the scale details given below and then go with the instructions to start the task. Place an “X” in the respective cell to indicate your choice. As you know, the rating includes below options:

- I hardly know the word.
- I just know the word by its form (how it looks/sounds) but don't know the meaning.
- I know both the form and meaning of the word.
- I know the form and meaning of the word but hardly used it.
- I know the word well and I use it

Word No.	Word	1	2	3	4	5
1						
2						
3						
4						
5						

- C. Explore the above words for their basic information such as common forms, meaning, parts of speech etc. You could explore them on the online learning tools, Yourdictionary at <https://www.yourdictionary.com/>, Visuwords at <https://visuwords.com/>, using flashcards on Quizlet at

https://quizlet.com/_90cnuc?x=1jqt&i=1ual0u or any other online resource used earlier. Then complete the following table with different forms of the words.

Noun	Verb	Adjective	Adverb

D. For each word listed above, write its meaning as you understand by referring the word on the online tools, its forms (at least two forms as noun / adjective / verb / adverb / conjunction etc.) and its respective use in a sentence.

- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():
- Word:
Meaning:
Part of speech 1 ():
Part of speech 2 ():

E. Carry out further practice and fun filled reinforcement on Quizlet using the link:
https://quizlet.com/_90cnuc?x=1jqt&i=1ual0u

Appendix VI: Pre-intervention and Post-intervention questionnaires analysis

Analysis of the responses for the choices 1 to 5 in the pre-intervention questionnaire:

Analysis of the Pre-intervention responses on the strategies use								
The Vocabulary learning strategy	Pre-intervention responses of the participants					Responses as 4 and 5		Mean of all responses
	NEVER TRUE (1)	USUALLY NOT TRUE (2)	SOMEWHAT TRUE (3)	USUALLY TRUE (4)	ALMOST ALWAYS TRUE (5)	Sum of the responses 4+5	% of the responses	
1) I guess meaning of a word from its context	0	0	10	23	3	26	72.22	3.81
2) I look for meaning or the paraphrase of a word in an online dictionary	0	3	10	16	7	23	63.89	3.75
3) I find the words with similar meaning	1	6	16	8	5	13	36.11	3.28
4) I find out the part of the speech of the given word	6	15	9	4	2	6	16.67	2.47
5) I look for related forms of the word noticing their prefixes or suffixes	4	11	12	6	3	9	25.00	2.81
6) I use online flashcards to know the meaning using the definition on the card	18	11	6	1	0	1	2.78	1.72
7) I refer to sentence(s) with the new word	2	5	19	6	4	10	27.78	3.14
8) I observe any pictures given in a text related to the words used	1	14	11	6	4	10	27.78	2.94
9) I ask other learner for paraphrase or a similar word	4	8	12	10	2	12	33.33	2.94
10) I ask facilitator for paraphrase or a similar word	2	7	15	10	2	12	33.33	3.08
11) I ask other learner for mother tongue translation	4	10	11	8	3	11	30.56	2.89
12) I ask facilitator for mother tongue translation	10	12	6	6	2	8	22.22	2.39
13) I discuss the meaning of a word or sentence with another learner	2	13	12	7	2	9	25.00	2.83
14) I discuss the meaning of a word or sentence with the facilitator	2	13	13	7	1	8	22.22	2.78
15) I study and practice meaning in a group	5	11	18	1	1	2	5.56	2.50
16) I think of links between what I already know and the new word	0	2	12	16	6	22	61.11	3.72
17) I try to use new words in speaking or writing to remember well	2	6	16	9	3	12	33.33	3.14
18) I study a word connecting it to a given pictorial representation	1	12	11	10	2	12	33.33	3.00
19) I refer to more sentences using the word	3	7	13	9	4	13	36.11	3.11
20) I connect the word to its synonyms and antonyms	1	2	11	17	5	22	61.11	3.64
21) I use online Semantic maps (group/map of related words) to learn	11	13	10	2	0	2	5.56	2.08
22) I use flashcards to remember new English words better	19	12	3	2	0	2	5.56	1.67
23) I physically act out new English words	10	7	16	3	0	3	8.33	2.33
24) I study and practice spelling of a word	2	12	13	7	2	9	25.00	2.86
25) I say new word aloud when studying	6	10	12	6	2	8	22.22	2.67
26) I remember other forms with suffix/prefix learnt	2	14	15	4	1	5	13.89	2.67
27) I paraphrase the word meaning on my own	0	7	12	13	4	17	47.22	3.39
28) I maintain a vocabulary notebook	12	19	5	0	0	0	0.00	1.81
29) I listen to and practice the pronunciation of a word	1	11	13	8	3	11	30.56	3.03
30) I say or write new English words several times	6	14	8	7	1	8	22.22	2.53
31) I use the English words learnt in different ways	2	7	15	10	2	12	33.33	3.08
32) I visualize the flash cards to recall words learnt	18	13	4	1	0	1	2.78	1.67
33) I learn words using online tool's feedback	9	9	14	2	2	4	11.11	2.42
34) I learn through fun filled matching activities	7	11	12	4	2	6	16.67	2.53
35) Reinforce by playing a word game	8	10	14	3	1	4	11.11	2.42
36) I use English-language media like Web sites, mobile phones communication	0	0	10	14	12	26	72.22	4.06
37) I test myself with word tests for reinforced learning	5	9	16	4	2	6	16.67	2.69
38) I practice words over a gap in a day	13	14	9	0	0	0	0.00	1.89
39) Try to use new words in speaking or writing	2	9	13	10	2	12	33.33	3.03
40) I think myself if I am learning the new words effectively	1	9	15	10	1	11	30.56	3.03
41) Use words in a sentence and share in an online group	10	14	9	1	2	3	8.33	2.19
42) Learn words from peers in an online group	5	9	14	5	3	8	22.22	2.78

Analysis of the responses for the choices 1 to 5 in the post-intervention questionnaire:

Analysis of the Post-intervention responses on the e-VLS use									
e-Vocabulary learning strategy	Post-intervention responses of the Participants					Responses as 4 and 5			Mean of all responses
	NEVER TRUE (1)	USUALLY NOT TRUE (2)	SOMEWHAT TRUE (3)	USUALLY TRUE (4)	ALMOST ALWAYS TRUE (5)	Sum of the responses 4+5	% of the responses		
1) I guess meaning of a word from its context	0	0	2	19	15	34	94.44		4.36
2) I look for meaning or the paraphrase of a word in an online dictionary	0	1	2	9	24	33	91.67		4.56
3) I find the words with similar meaning	0	0	5	17	14	31	86.11		4.25
4) I find out the part of the speech of the given word	0	2	11	17	6	23	63.89		3.75
5) I look for related forms of the word noticing their prefixes or suffixes	0	3	15	12	6	18	50.00		3.58
6) I use online flashcards to know the meaning using the definition or pictures	0	4	5	21	6	27	75.00		3.81
7) I refer to sentence(s) with the new word	1	0	2	18	15	33	91.67		4.28
8) I observe any pictures given in a text related to the words used	0	1	6	20	9	29	80.56		4.03
9) I ask other learner for paraphrase or a similar word	0	9	11	13	3	16	44.44		3.28
10) I ask facilitator for paraphrase or a similar word	0	7	12	15	2	17	47.22		3.33
11) I ask other learner for mother tongue translation	1	14	15	4	2	6	16.67		2.78
12) I ask facilitator for mother tongue translation	3	16	9	6	2	8	22.22		2.67
13) I discuss the meaning of a word or sentence with another learner	0	3	13	16	4	20	55.56		3.58
14) I discuss the meaning of a word or sentence with the facilitator	0	8	12	11	5	16	44.44		3.36
15) I study and practice meaning in a group	2	4	5	22	3	25	69.44		3.56
16) I think of links between what I already know and the new word I learn	0	0	6	16	14	30	83.33		4.22
17) I try to use new words in speaking or writing to remember well	0	0	7	21	8	29	80.56		4.03
18) I study a word connecting it to a given pictorial representation	0	1	8	20	7	27	75.00		3.92
19) I refer to more sentences using the word	0	1	4	19	12	31	86.11		4.17
20) I connect the word to its synonyms and antonyms	1	1	4	20	10	30	83.33		4.03
21) I use online Semantic maps (group/map of related words) to learn	0	1	7	15	13	28	77.78		4.11
22) I use flashcards to remember new English words better	0	4	6	20	6	26	72.22		3.78
23) I physically act out new English words	1	9	12	11	3	14	38.89		3.17
24) I study and practice spelling of a word	0	2	9	15	10	25	69.44		3.92
25) I say new word aloud when studying	1	4	11	13	7	20	55.56		3.58
26) I remember other forms with suffix/prefix learnt	0	3	16	14	3	17	47.22		3.47
27) I paraphrase the word meaning on my own	0	2	7	14	13	27	75.00		4.06
28) I maintain a vocabulary notebook	6	16	7	5	2	7	19.44		2.47
29) I listen to and practice the pronunciation of a word	0	0	4	22	10	32	88.89		4.17
30) I say or write new English words several times	2	4	13	13	4	17	47.22		3.36
31) I use the English words learnt in different ways	1	0	9	19	7	26	72.22		3.86
32) I visualize the flash cards to recall words learnt	1	4	4	20	7	27	75.00		3.78
33) I learn words using online tools feedback	0	2	4	22	8	30	83.33		4.00
34) I learn through fun filled matching activities	0	3	5	16	12	28	77.78		4.03
35) Reinforce by playing a word game	1	2	4	20	9	29	80.56		3.94
36) I use English-language media like Web sites, mobile phones content	0	0	1	3	32	35	97.22		4.86
37) I test myself with word tests for reinforced learning	0	2	5	22	7	29	80.56		3.94
38) I practice words over a gap in a day	2	6	17	9	2	11	30.56		3.08
39) Try to use new words in speaking or writing	0	0	7	22	7	29	80.56		4.00
40) I think myself if I am learning the new words effectively	0	1	9	17	9	26	72.22		3.94
41) Use words in a sentence and share in an online group	1	3	16	13	3	16	44.44		3.39
42) Learn words from peers in an online group	0	2	7	20	7	27	75.00		3.89

Appendix VII: Sample excerpts of learner reflections and interview responses used for qualitative analysis using QDA Miner Lite software tool

I. The excerpts of reflections from the learner reflective journals for the question, “What were your views on using online tools for learning words today?”:

They gave me more examples to get familiarized with

They helps to understand the meaning of the words effectively and easily

Helped me understand the context of the words and how to actually use them in sentences better.

The online tools made the task easy to learn the words quickly by providing the related synonyms and also by providing more examples for the usage of the sentences.

They made my job easy by providing the relevant content and also provided many sentences with the word.

They helped me a great deal as they have provided the meaning of the word as well as sentences using that word.

The tools helped in connecting the new and the known words. They helped to learn a word and also the words around it.

helped me recognize the parts of speech of the word and hence with example sentences helped me understand the meaning

To know the meaning and also by providing word games to understand the word better

Online dictionaries helps in understanding the meaning of the word, from there i find words with similar meaning of the words and try to form a sentence.

online tools helps me a lot

Some of the tools show the different forms of the word and its usage, so it helps me to remember that word and its meaning easily

To understand the meaning as well as its parts of speech

Firstly I have searched for the meaning and later I tried to find synonyms, its other forms as verb, noun, adjective etc and sentences of the word using the online tools. They were readily available.

With the help of visuwords I was able to look up how the word relates to other simpler words which I previously knew.

They helped to know how to use a word effectively and I used then in a conversation

Never heard of the word but as soon as I searched for the meaning using online dictionary, I not only knew the word but understood the meaning and later by knowing its parts of speech I was able to form sentences using the word

Using wordhippo and yourdictionary interested me to refer to find usages of the words in sentences. They helped in understanding words in various contexts and then form my own sentences.

Using not just Google dictionary but also Visuwords, Merriam Webster, Quizlet and Wordhippo facinated me to explore word meanings, its other forms and sentences using the words to do the given activity.

They gave me lot of new information on the words that I did not know so far.

online tools very helpful to me in order to get the meanings of new words.

The tools helped me to learn meaning and to pronounce the words.

They reinforced learning by playing a word game, reading many sentences on the tools helped me in paraphrasing the word meaning on my own

Some of the tools shows the different forms of the word and its usage, so it helps me to remember that word and its meaning easily and for longer time

Helpful in easily understanding the meaning through pictures on Quizlet flash cards

The online tools helped me to pronounce, learn the meaning and also usage of the word in sentences.

They helped in searching multiple sentences to that word and its other forms like noun, verb, adverb etc.

Helped to guess the word meaning from the sentences contexts and easily learn from online dictionary, Yourdictionary was quick to understand compared with other dictionaries used

They helped me in understanding the meaning of the word and also related sentences with the word

In a single website, I found the meaning and its other forms easily and in a short time.

II. The excerpts of reflections elicited from the learner reflective journals for the prompt, “Share if something interested you today regarding using online tools when compared to your earlier classroom learning”:

By using these online tools, I got to know about the word in much better way than I would get in a regular classroom

Understood the different parts of speech of the word and how to use them, it was confusing earlier

Referring more sentences using the word in a very short time and know much about a word use

the graphical interfaces made my learning interesting and better

I found flashcards as an interesting tool, as it is more fun while learning.

The thing that I found most interesting while using the online tool was learning with the visuwords platform. While searching for a word in this online platform it generates us the synonym, antonym and also the noun, verb, adjective and adverb of the given word in particular animated fashion. Learning with tools like visuwords, Quizlet and online dictionaries was a new learning for me.

I got to explore more words that I have not heard of before..

Flash cards provided on Quizlet were interesting to learn words today and in earlier activities parts of speech fascinates me all the time. Visuwords and other tools presented it interestingly.

Just like every other task, i once again had fun knowing new words and their usage with real time sentences given on the tools

Flashcards created interest to learn by looking at the pictures given there and the word definitions

One tool can help to find a lot of information about a word rather than searching in different sources

Flashcards helps me to remember the meaning of the word as the pictorial representation of the words meaning lasts forever in our brain even we forget or confuse about the word we can know more related to that word and can find more information compared to a classroom.

They saved lot of my time because they gave much information about a word in a short time

To know different forms of the word and usage at one place

The parts of speech has always been a trouble for me but I can surely tell now that learning parts of speech using these tools was very easy and it has helped me know about the word more. I always get confused if I know more about a word but these tools and the exercises helped me overcome that confusion.

Classroom learning limits in terms of not letting us explore a word or concept more. There is a predefined way to teach something and everyone is at its mercy, regardless of their learning style. But learning with these tools gave an opportunity to learn in my own way, in my leisure time and explore as much as we wish to learn about any word.

The dictionaries of google and Merriam Webster along with yourdictionary continued to provide the needed support and to visualize the scope of a word and its various forms has been very useful in understanding the literal meaning of the words and also their usage in various forms.

It was interesting that we can get meaning and usage of any word with in fraction of seconds using these tools.

It is easy, effective and efficient to learn new words online compared to classroom learning. wide range of online content to reach, and learn in our own way gives us to know where we are lagging and provides a scope to learn in our own style, time and speed.

Flashcards are useful with the pictures for the words to remember meaning well. They help us to recollect if we forget word meaning also.

graphical representations made learning better and remember well than classroom learning

I found that the visuwords and yourdictionary are very helpful and they have an advantage that visu words gives it synonyms, antonym and also the different forms of the given word.

Yourdictionary gives many useful sentences to learn a word.

The online tools made a difference in Searching sentences to that word and its other forms

The tools made learning faster and easier

I found the words very interesting as some of them are pretty new to me and I have learnt new words and where to use them and in what context.

These platforms also provide the synonyms for the words which are quiet helpful

I am able to see different forms of a word, its parts of speech and its origin in one place.

This approach gave a better information to remember a word after learning it. This was not a practice in a classroom.

III. Sample excerpts of the interview responses conveying learner perceptions on the use of the online learning tools:

“The tools have definitely helped in learning vocabulary in new ways compared to my earlier ways like to just google a difficult word whenever I come across to find out its meaning and move on”.

"These tools made my job easy by providing the relevant content and provided many sentences with the words".

"Different sentences I came across helped in understanding not just its primary meaning but varied context driven meanings."

"They not just provided different meanings but also provided different words that mean the same."

"This has been a new approach altogether because we used internet but not such tools ever. Moreover, at the beginning I got puzzled what the use of these tools is when we already have google to search but then gradually got their significance and got used to it".

"The tools not only helped in learning new words but also the partially familiar words like how to use them and in which contexts they are used".

"As it is said a picture speaks more than words the pictorial representations provided on the flashcards were very helpful in easily registering a word in my memory".

"To comment specifically on the online dictionaries, they were quite different in use when compared to the usual physical dictionaries. They provided lot more word knowledge than just meaning and pronunciation so for the learners they widened the scope of learning vocabulary".

"I agree that using these tools take comparatively more time but I felt it is worth to do so because I felt I was engaged with the information and because I learnt much more than what I expected".

IV. Sample excerpts of the interview responses for the question, “Was there a difference in the time needed to explore words at the beginning of using this approach and later on?”:

"To be frank I didn't understand these tools and their use at the beginning and it took some inertia ending up sparing more time. But when I got to know them and their use the amount of time I needed to spend gradually reduced”.

“As I remember, at the beginning every student had a time lag issue. Overtime, we got better aware of the use of these tools and could complete the activities in much lesser time”.

“I was comfortable with classroom learning but when I began to use also the online learning tools, my learning turned much better for me comparatively”

“Classroom learning is not self-paced learning whereas online learning could be steered according to our need”

“Online tools have got multiple forms of the word and multiple meanings which is not a case in our usual classroom learning”.

“They are rich in content and cheaper in price”.

“I took more time when I started. Later I reduced it a lot and got familiar how to use”

“After getting used to the tools, I needed very less time to study all words”

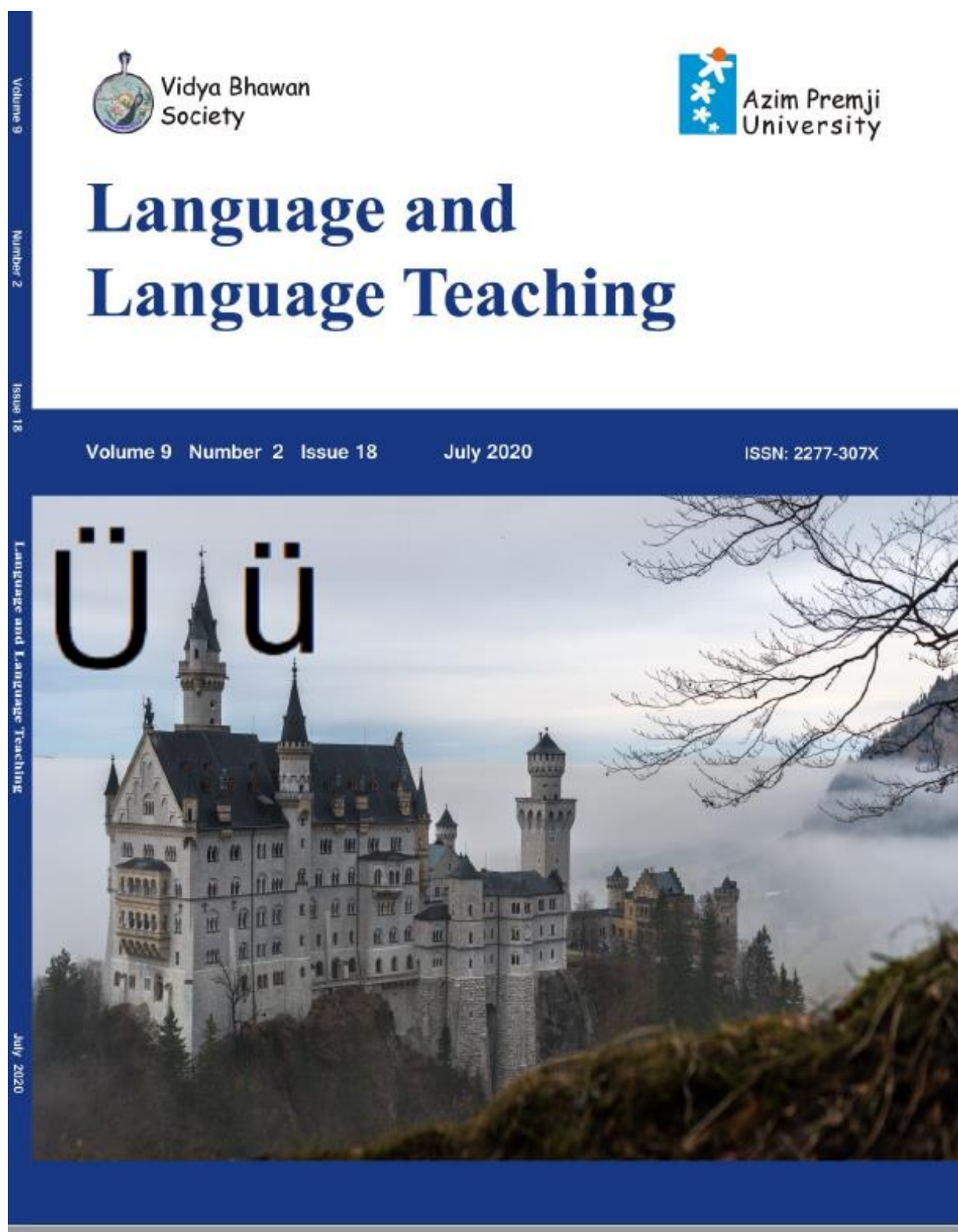
“I am thankful to the online tools, they saved lot of my time. I learnt many things in short time”

“Sometimes the information about words was more but then tools saved time by presenting them interestingly”

“I needed some days to habituate to the online tools learning. When I was okay with them, they saved lot of my time. I used it for other things I needed to do”

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Contents

Editorial

Rajesh Kumar and Devaki Lakshminarayan

How not to Improve Heritage Language Competence: The Case of Farsi

Nooshan Ashtari and Stephen Krashen 53

Articles

"Forced Pleasure Reading May Get You Neither": A Reply to Jeff McQuillan
Brett Milliner

Interview
Interview with Tara Mohanan
Praveen Singh 59

Free Voluntary Reading and Heritage Language Development
Grace Cho and Stephen Krashen

Landmark
Foreign Language Studies in India: Some Critical Observations
Milind Bramhe 68

Knowledge of Spelling Consonant Clusters in Young ESL Learners: A Study
Kankan Das

Classroom Activities
Activities for Integrating Speaking with Reading and Writing Skills
Vanita Chopra 76

Mother Tongue Education for Revitalising Endangered Languages: Miju and Digaru
Dimple Choudhury

Book Reviews
Developing Expertise through Experience
Shreesh Choudhary 81

How do Teachers Handle Linguistic Diversity in Classrooms?
Devaraja Kodabala

Perceptions of Language Pedagogy
Robert Bellarmine 85

Online Semantic Mapping Strategies for Augmenting Retention of Lexical Fields: Applying Theory into Online Practices
Kotturi Krishna Swamy

Report
Online Lessons: New Platforms for Teaching-Learning
Ameya M.R. and ERC English Team 90

Formal Grammar?: They Already Know it, so Just Show it
Arvind Sivaramakrishnan

40

Providing Opportunity for Creative Expressions in Classroom: A Study
Naganada G. V.

46

Online Semantic Mapping Strategies for Augmenting Retention of Lexical Fields: Applying Theory to Online Practices

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Key Words: Vocabulary learning, Learning strategies, Semantic mapping strategy, Lexical fields, Online semantic mapping tools, MindMup 2.0

Abstract

Vocabulary learning is a prominent aspect of attaining mastery in a language. At the same time, it is a complex cognitive process (Cook, 2001), that leaves the learners, especially the weak vocabulary learners, with learning difficulties. Enabling such learners to use strategies such as semantic mapping would help them navigate this complex process more effectively. Integrating the use of certain online learning tools available with the advent of web 2.0 technology could help this process further and lead to better retention of the lexical fields. This paper attempts to analyse these possibilities by drawing a link between vocabulary learning difficulties, use of semantic mapping strategy and the use of an online tool, MindMup 2.0. The paper begins by introducing the challenges in vocabulary learning and then brings in the prominence of semantic mapping strategy in addressing them. This is followed by a discussion on the multidisciplinary perspectives of the strategy and from this an outline of its theoretical framework has been critically drawn. Finally, the paper argues in favour of implementing the essence of the theoretical underpinnings of the strategy using online tools for better lexical retention.

Vocabulary Learning

For successful language learning, vocabulary learning and the process involved in it play a prominent role. Vocabulary was a neglected domain of SLA and received attention much after the four language skills. Until then, despite adopting various methods for teaching the four language skills built on a strong theoretical base, there were still challenges in getting learners to attain the desired proficiency. Perhaps this was because the role of vocabulary was disregarded, and there was no explicit research to understand the process involved in learning it. Later research has established that vocabulary as "a core component of language proficiency and provides much of the basis for how well learners speak, listen, read and write" (Richard and Renandya, 2002, p. 255); also vocabulary learning involves a complex cognitive process (Cook, 2001). The traditional approach to learning vocabulary was through learning a word just by its form and its meaning and rote memorization. Such a surface approach coupled with lack of opportunities to learn and practice vocabulary results in the learners relying more on an instructional environment and traditional academic input, which in turn leads to vocabulary learning difficulties (Kumaravadivelu, 2006; Brown, 2014; Souleyman, 2009). For the last 3 years, there has been a strong opposition to the use of surface-level approaches (Khoii & Sharififar, 2013). This reluctance has favoured the argument for more constructivist and thought-oriented strategies such as semantic mapping. Therefore, researchers are inclined to move towards learning strategies to

explore how these could result in effective vocabulary learning. Enabling the learners to use specific strategies may go a long way in addressing these challenges. Semantic mapping is one such strategy as it involves a more in-depth processing approach (processing of word knowledge in the context). Additionally, it can be practised outside the classroom, which in turn increases the opportunities for vocabulary learning.

Semantic Mapping Strategy

Semantic mapping strategy has been a part of almost every taxonomy of strategies that were proposed based on the cognitive mechanisms. It is treated as an important strategy in Oxford's (1990) taxonomy of strategies for language learning. Semantic mapping strategy falls under language learning strategies (LLS). LLSs are defined as "any set of operations, steps, plans, routines used by the learner to facilitate obtaining, retaining, retrieving and using the information" (Wenden & Rubin, 1987, p. 19). Semantic mapping is the categorical structuring of information in graphic form. "It is an individualized content approach in that learners are required to relate their new words to their own experiences and prior knowledge" (Johnson & Pearson, 1984). While doing this, learners carry out particular operations and steps, thereby turning semantic mapping into a strategy. Semantic mapping strategy is a cognitive vocabulary learning strategy that maps visually and displays a set of words/phrases (that are new to the learner) and a set of related

words/concepts (already known to the learner), with underlying meaning level associations. In other words, it is a way of visually representing the semantic connections between familiar and unfamiliar words in a language while learning vocabulary.

Approaches to Semantic Mapping Strategy

There are multidisciplinary approaches to look at what necessitates the idea of bringing extensive use of semantic mapping strategy into L2 classroom practice.

Philosophical Approach

A philosophical perspective questions how anything could mean anything. For instance, how could a noun denote an animate/inanimate object? Philosophically, this implies that earlier there was just animate and inanimate reality around human beings and attributing a pattern of sound, a word or a meaning to an entity came much later. This implies that different aspects of an entity would have been attributed with words which are closely related in terms of what they mean, in order to recognize them as belonging to one collective entity. In other words, linguistically, the vocabulary of a language is not a body of isolated lexemes, but a collection of numerous interrelated lexical fields. Though while learning vocabulary, visualization of these lexical fields and an overview of their connections are necessary, it is hardly emphasized in traditional learning practices for certain practical reasons.

Although learners are taught dispersed vocabulary using different methods, they subconsciously try to integrate them with the relevant pre-existing items that they are familiar with and form a lexical network of their own. This integration implies that both the linguistic lexical system and the subconscious lexical network formed by the learner follow a lexical pattern that is governed by the internal semantic relativity of the learner. However, this pattern is never a part of the lexical input given to the learner. In such subconscious and implicit processes of forming networks, one might take a very long time to encounter a lexical item that was learnt much earlier and which is very close to the item in its lexical field. Such a process of reaching implicit learning is a convoluted one. It would be helpful if learners were explicitly instructed about pre-existing associations of the lexical items using semantic mapping strategy and trained to cognitively visualise the integral structure of the language vocabulary.

Psycholinguistic Approach

A psycholinguistic approach is concerned with certain fundamental issues related to mental processing of meaning, such as how the mind represents a meaning or how a piece of intended information can be drawn from a lexical input instantly. Addressing this to an extent, Leslie, Friedman, & German (2001) state that there is an innate theory of mind that produces cognitive representations of a person's mental attitudes or states. A biological approach further addresses this mechanism and reveals the innate nature of the brain.

Biological Approach

Hardcastle and Stewart (2002), posit, on the basis of brain imaging studies, single-cell recording and neurological studies, it

is evident that different parts of the brain carry out different activities; these activities are confined to specific processing streams. As per the current understanding of vocabulary learning, it is clear that the left half of the brain works logically, linking vocabulary to related schematic ideas; and the right half of the brain recognizes concepts by taking the image of the bigger picture into account (King, 2011). A semantic map would integrate both sides of the human brain, as it would engage the learners in establishing logical meaning level associations among the words, thereby forming a visual map. Such a map is altogether a better way of providing lexical input to the learners. Furthermore, neurological perspectives based on research in the field suggest that the closer the arrangement of input to the imprint of the lexical patterns in one's memory, the higher the chances of successful learning of vocabulary.

Theoretical Framework for Semantic Mapping

Connectionism

Since the mid-1980s, there have been a growing number of studies in language acquisition that have applied the connectionist framework. Advancement in computer technology has given a new shape to the theory of connectionism. According to this theory, information-processing in the brain is similar to that of a computer. The neural networks in the brain function just like the complex clusters of information in computer execution. Learning, therefore, occurs as an associative process. The human mind is predisposed to look for associations between elements and creates links

between them just as a computer does with different commands. The links become robust as these associations keep recurring. Some aspects of this theory are closely related to the vocabulary learning process. Unlike a generative grammar that has a set of rules, connectionism has no rules. The neurons "know" how to activate patterns; after the fact that data coding provides rules as a label for the sequence (Schunk, 2012).

Cognitive Theory

The cognitive theory is not one theory but consists of the theories of Piaget, Vygotsky, Ausubel and Bruner to mention a few. Research into ESL learner strategies usually includes Piaget's cognitive perspective as a part of its theoretical framework (McLeod, 2018). Piaget argues that the way human knowledge is gradually constructed and used is similar to the nature of vocabulary building using learner strategies. This cognitive perspective has led to the emergence of a wealth of SLA studies in the recent time under cognitive psychology. The primary point of investigation for cognitivists is the processing involved and its development among the language learners. The semantic mapping strategy emphasizes on the process of analysing the lexical input, assimilating it with the existing knowledge, which in turn enhances the chances of retaining it for a longer time with the help of the semantic associations formed.

Assimilation Theory by Ausubel (1962)

Ausubel's assimilation theory is a pre-eminent basis for semantic mapping strategy as it emphasizes meaningful learning. According to Ausubel (1968), meaningful learning results from the assimilation of new words/concepts into

existing words/concepts. Prior knowledge is an essential prerequisite for learning new words and concepts. The justification for the necessity of possessing previously acquired knowledge is that it assists the learner in resolving misinterpretation of the new word as well as in retaining the newly learned lexical information. Therefore, by consciously linking new information with earlier acquired lexical knowledge, learners attempt to construct an understanding of their own (Brown, 2000). As a consequence, meaningful learning takes place, which leads to better retention of the lexical field.

Bringing Semantic Mapping Strategy into Practice

The potential of the semantic mapping strategy is immense, but its application has barely been studied. Moreover, the limited research available has been carried out in a traditional classroom setting in the Far East, the Middle East and the UK. Zahedia and Abdib (2012), in a study conducted on lower-intermediate learners in Iran, report that the strategy was successful with them. Khoii and Sharififar (2013) found in another study that learners did not prioritize semantic mapping strategy over rote memorization at Islamic Azad University, North Tehran. The reason behind this preference was shared by the learners and is most insightful. The learners in the study revealed that they tend to opt for an easy way of learning such as using an e-note book to search for meaning instead of engaging in a strategy that would demand a more cognitive process to learn a word. This finding brings up issues of perception and prior orientation to the semantic strategy and not that of strategy. Bringing

the strategy into the L2 classroom would be productive, and a further investigation into the strategy may yield better insights.

Moving a step ahead of practising the strategy in the traditional classrooms using pen and paper or board and marker, technology-enhanced online tools can also be used to draw semantic maps. The idea behind propagating such online tools into L2 classrooms is that these tools have learner-friendly multimodal affordances to better facilitate the strategy and not because they are available or that they introduce new practices.

Online Tools for Semantic Mapping Strategy

There are many online mind mapping tools that can be adopted for practicing semantic mapping strategy. These include tools such as Popplet, MindMeister, Bubbl.us, MindMup2.0, Coggle, Webspiration classroom, etc. Some of these tools are freely available, others have paid access, and some others are available free for a limited time. They all function almost similarly in forming semantic maps. However, tools such as Coggle, MindMup 2.0 and Webspiration classroom have some additional learner-friendly features, such as adding visual images related to the word, adding a video clip if needed and transposing the maps formed into a hierarchical text document. The idea behind these tools is that effective integration of technology-enhanced tools makes it easier for learners to achieve their goals (learning vocabulary with a deeper approach, increasing learning opportunities outside the classroom, thereby reducing reliance

on instructional input, etc.). Research shows that this strategy was successfully explored in the traditional classrooms, to map difficult concepts in subjects such as natural and physical sciences. It was explored in traditional ESL learning spaces, and to some extent in the online learning spaces. This can perhaps be attributed to two reasons. First, that use of online tools is still in its emerging phase in many countries. Second, the available tools are not specifically designed for language learning, but for more generic purposes such as planning and organizing ideas and procedures in corporate and business sectors. Nevertheless, they can be adopted for language learning as their features and multimodal affordances are added advantages for the learners. I have attempted to use MindMup 2.0 to apply some of the theoretical underpinnings mentioned earlier and discuss how it can facilitate better retention of lexical fields.

Practical Application of the Strategy

Semantic mapping strategy can be practised in two ways: theme based semantic mapping and word based semantic mapping.

Theme Based Semantic Mapping

In theme-based semantic mapping, a selected theme acts as the core. This core theme is then associated with keywords, and these words are 'mapped' around the theme. The keywords are further associated with their related words to form a complex lexical field on the core theme.

Word Based Semantic Mapping

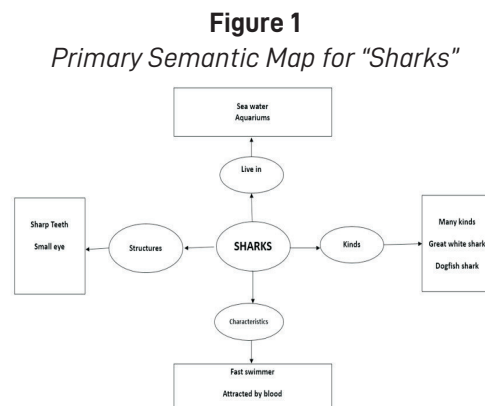
In word-based semantic mapping, the target word is placed at the core.

Thereafter it is extended towards the periphery by associating the word to related words in two major ways. Firstly, by associating the target word with its known synonym or antonym, or an example demonstrating the use of the word; secondly by associating it with a word drawn from the personal experience of the learner for better learning (Antonacci, O'Callaghan & Berkowitz, 2014).

A sample lexical field has been taken and analysed to understand how these two ways of forming semantic maps facilitate better retention of the lexical field, for all learners, more so for weak vocabulary learners (Gambrell, Wilson and Gantt, 1981). Teachers and teacher educators find enabling learners to form semantic maps by carrying out brainstorming even before exposing them to the target words in a selected text as a positive approach (Johnson, Pittelman, Bronowski & Levin, K. M., 1984). Therefore the analysis here is carried out for weak vocabulary learners and taking into account the context that they are made to form semantic maps before making them read the text with target words. An undergraduate learner sample (learning English as L2) seems to be suitable in this respect, as they are assumed to possess a minimum level of English vocabulary and technical skillset to use the online tools for forming the semantic maps. In the first example, the lexical field has been discussed in a traditional setting, and the semantic map has been formed using a pen-paper/board. In the second example, an online tool has been used to create a lexical map to demonstrate the advantages of online tools and to understand how these tools lead to better retention of the lexical field.

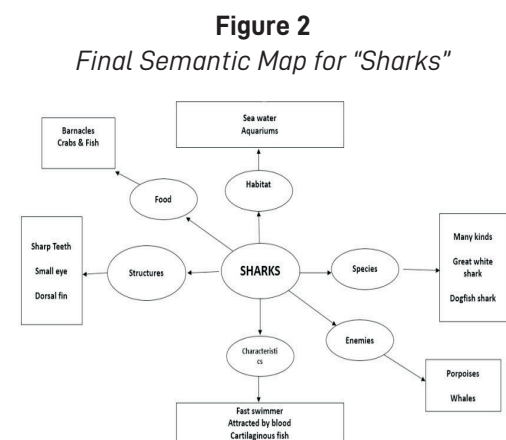
Sample Analysis for Theme-Based Semantic Mapping

Let us assume that the theme in a given text is "sharks". The learners have to first draw a semantic map by linking everything they know about the given theme. The teacher has to assist the learners in brainstorming so that they can recollect their prior knowledge of sharks. The learners could start with basic information about sharks: where do they live, what are the different types of sharks, how do they look, what are their characteristic features, etc., and come up with a possible semantic map as shown in figure 1.



This primary map gives the teacher an idea of the vocabulary level of the learners and hence the target vocabulary that can be associated with their prior knowledge on sharks. For instance, if they use the words "live in", in their semantic map, they could be exposed to the word "habitat" from the text and replace it in their map. Similarly, the learners could replace the word "types" with "species", when they read about the different "species" of sharks in the text. This way,

the learners can replace a previously known phrase/word with a new word that is more academic and appropriate. The teacher could then add some theme-specific words that they had not thought of. For instance, if the text talks about the food habits and the enemies of sharks, these could be added as new associations to the central theme. In the end, the learners would come up with a probable semantic map as shown in figure 2. In both cases, (replacing or adding new words), learners do not just deal with words, but they go through a process of assimilating the new word knowledge with their prior knowledge.



Sample Analysis for Word-Based Semantic Mapping Using an Online Tool

The target word "induce" was chosen for the word-based semantic mapping. This word is drawn from the Sublist 8 of the Academic Word List (AWL). AWL consists of most frequently occurring words in the academic corpus. The list indicates the minimal word knowledge required for comprehending academic texts. The semantic map of "induce" is analysed to

show how the use of online semantic mapping strategies (such as MindMup 2.0) leads to better retention of its lexical field. These semantic mapping strategies include various other strategies such as grouping, organising, sharing in a group, etc., that interplay while practising online word-based semantic mapping. In order to learn a set of target words from AWL, learners are encouraged to form semantic maps for each word independently.

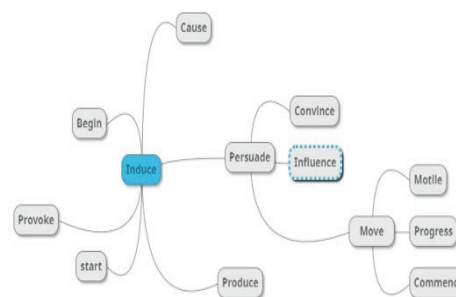
An orientation to online semantic mapping, such as MindMup 2.0, is given to explain mapping. When learners encounter a word for the first time, they are encouraged to use a lexical resource such as an online dictionary, to link the new word to the target word at the meaning level. The teacher also needs to provide an overview of the affordances of the platform to get them accustomed to drawing semantic maps. After forming the primary semantic map, the teacher gives an authentic text (created by the teacher if needed), integrating all the chosen target words to enrich the contextual word knowledge of the learners. This can be followed by an exercise to reinforce the words and so that the learners can gain mastery over the word. The online tool facilitates an easily accessible graphical interface for the learners to draw various shapes (and add the words within these shapes) that can be interconnected to represent the associations between the words.

One would think this could be done on a paper or a board as well. However, doing it using an online tool makes a difference to the learners and their active learning. The tool allows for flexibility in placing the words close to or further from the target word in the semantic map, based on the learners' prior knowledge of their relationship to the target word. Learners

can alter this relationship by relocating the boxes if they find that a word is not as closely related as they had thought. They can also add a supporting image, a video or a recording to the word to enrich its meaning and improve cognition; they can add a hyperlink to gain further knowledge. Learners can take this learning outside the classroom on a mobile device and continue with the semantic mapping in their own time and at their own pace. In addition, this online semantic map can be shared with peers to ask for feedback and refine it further. Similarly, one could also comment on another learners' map, hence resulting in collaborative learning. All this is possible only because this tool can be used anywhere, even outside the classroom, and more importantly at any time. Lastly, MindMup 2.0 can be used to transform a semantic map into a hierarchical outline auto-generated by the tool. The learner can take a printout of this outline or the semantic map and use it for offline learning.

Figure 3 shows a possible semantic map drawn on MindMup 2.0 for the target word "induce". Looking at the semantic map, we see that the target word "induce" is closer to the words "cause" or "start" and comparatively farther from the word "persuade". The learner could also relate

Figure 3
Semantic Map of the Word "Induce" Using MindMup 2.0



the word "persuade" to "move" in a sense, and further relate the word "move" to "motile", with the sense of mobility. In the end, when the learner looks back at the map she/he finds "induce" at the core of the map "move" at the periphery and "motile" as a word no more related to the target word "induce". All the words and the associations around the target word "induce", right up to the periphery word "move" represents its lexical field. Moving a step ahead, the teacher can point out the beginning of a new lexical field of the word "move", which is on the periphery of the adjacent lexical field. Visualizing this, enables the learner to perceive the big picture of the complex lexical network of the lexemes, rather than looking at them as individual lexical items. The process involved in forming the map—identifying the semantically related words, grouping them under a common lexical field, organising them on the map based on the association they share, exploring a new lexical item further wherever needed, learning collaboratively through online sharing—facilitates a deep vocabulary learning approach. Following this, if the teacher introduces the authentic text of the target word to the learner, the level of comprehension of the target word would be much higher than if the learner directly accesses the text and encounters the word. Higher level of comprehension is because the learner do not just learn the new word in isolation, but assimilates the new word knowledge with the previous knowledge, thereby establishing a

connection that helps to overcome misinterpretation of the new word and contributes to better retention, as Ausubel's assimilation theory argues. In such a process of assimilation, the learners relay on their innate mind mechanism (Leslie, Friedman, & German 2001) and draw a semantic map that is unique to them. Therefore there is every possibility that one learner's semantic map may not be the same as that of another. In fact, even the sample semantic maps in the article would not be the ideal or the final maps, but liable to differ slightly from learner to learner.

Despite these variations, it is still productive to encourage learners to form individual semantic maps because the group of online semantic mapping strategies that interplay together ensure that a learner's map lies closer to the lexical pattern imprint of his/her memory. Further, as neurological research suggests, the closer the input to the memory's lexical pattern, the higher the chances of effective learning and augmented retention of lexical fields of the target words for a longer time. Thus, online tools would definitely do a better job in bringing the semantic maps closer to their cognitive imprint with a prior orientation. These tools also effectively integrate the left and the right half of the brain by engaging the learners in learning logical associations of the words and forming visual maps, respectively.

References

- Antonacci, P. A., O'Callaghan, C. M., Berkowitz, E. (2014). *Developing content area literacy: 40 strategies for middle and secondary classrooms*. Washington D.C.: Sage Publications.
- Ausubel, D. P. (1962). A subsumption theory of meaningful learning and retention. *Journal of General Psychology*, 66 : 312-224.

- Ausubel, D. P. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart and Winston
- Brown, D. H. (2000). *Principles of language learning and teaching: A course in second language acquisition. (4th ed)*. New York: Pearson Education.
- Cook, V. (2001). *Second language learning and language teaching*. London: Hodder Education.
- Gambrell, L., Wilson, R. M., & Gantt, W. N. (1981). Classroom observations of task-attending behaviors of good and poor readers. *The Journal of Educational Research*, 74(6), 400-404.
- Hardcastle, V. & Stewart, M. C. (2002). What do brain data really show? *Philosophy of Science*, 69(3), S72-S82.
- Johnson, D., & Pearson, D. (1984). *Teaching reading vocabulary (2nd ed.)*. New York: Holt, Rinehart and Winston.
- Johnson, D., Pittelman, S. D., Bronowski, S. T., & Levin, K. M. (1984). *An investigation of the effects of prior knowledge and vocabulary acquisition on passage comprehension. Program Report*, 84-85. Madison, WI: Wisconsin Center for Education Research, University of Wisconsin.
- Khoii, R., & Sharififar, S. (2013). Memorization versus semantic mapping in L2 vocabulary acquisition. *ELT Journal*, 67(2), 199-209. <https://doi.org/10.1093/elt/ccs101>
- King, G. (2011). *Understanding Mindmap Software – What is Mind Mapping?* <http://www.novamind.com/mindmapping-software/>
- Kumaravadivelu, B. (2006). *Understanding language teaching from method to postmethod*. London: Lawrence Erlbaum Associates Publisher.
- Leslie, A. M., Friedman, O., & German, T. P. (2001). Core mechanisms in “theory of mind”. *Trends in Cognitive Sciences*, 8(12), 528-533.
- McLeod, S. A. (2018). *Jean Piaget's theory of cognitive development*. <https://www.simplypsychology.org/piaget.html>
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Boston: Newbury House.
- Richards, J. C. & Rodgers, T. S. (2001). *Approaches and methods in language teaching. (2nd ed)* Cambridge: Cambridge University Press.
- Richards, J. C. & Renandya, W.A. (2002) (Eds.) *Methodology in Language Teaching: An Anthology of Current Practice*. Singapore: Cambridge University Press.
- Schmitt, N., Bird, R. Tseng, A. & Yang, Y.C. (1997). Vocabulary learning strategies: Student perspectives and cultural considerations. *Independence Spring*, 4-6.
- Schunk, D.H. (2012) *Learning theories: An Educational Perspective, (6th ed)*. Boston: Pearson.

Souleyman, H. M. (2009). *Implicit and explicit vocabulary acquisition with computer assisted hypertext reading task: Comprehension and retention*. Doctoral dissertation. The University of Arizona. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.470.4323&rep=rep1&type=pdf>

Wenden, A. L., & Rubin, J. (1987). *Learner Strategies in Language Learning*. Englewood Cliffs, NJ: Prentice-Hall.

Zahedia, Y., & Abdib, M. (2012). The effect of semantic mapping strategy on EFL learners' vocabulary learning. *Procedia: Social and Behavioral Sciences*, 69, 2273-2280.

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Paper 1

Title: Learning beyond classroom through follow up activities on Moodle

Conference: 5th AINET International Conference



Paper 2

Title: Online Learning Tools and e-Vocabulary Learning Strategies

Conference: A Two-Day National Conference on Innovations in Teaching ESL and Literature: The Present and the Future (ITESLLPF) held at NIT Warangal in 2019.



e-Vocabulary Learning Strategies of ESL Learners: An Exploratory Study

by Kotturi Krishna Swamy

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