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Research Paper

The Effect of Vocabulary Learning Strategy Training on Vocabulary Knowledge: The Case of Addis Ababa University

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Abstract

The specific purpose of this research was to examine the effect of vocabulary learning strategy instruction on university students' breadth and depth of vocabulary knowledge using an experimental research design. Both the control group (20 students) and the treatment group (20 students) sat for pretests and post-tests of vocabulary knowledge. In between the pretests and posttests, vocabulary learning strategy training was offered only to the treatment group. Finally, the results of the two groups were compared. The vocabulary learning strategy training was offered for 16 hours. The vocabulary strategy training material was produced by integrating the vocabulary lessons of Communicative English Language Skills I module of Ethiopia and the vocabulary learning strategies identified by Schmitt (1997) and renowned vocabulary books of various authors such as Oxford (1990), Nation (2001), Carter (1998) and Takač (2008). Independent samples t-test was used to assess if there was a statistically significant difference between the experimental and control groups. Paired samples t-test was also run to see if there was a statistically significance difference between the pre and post mean scores of the students in the treatment and control groups. The treatment group students scored better than the control group students on

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breadth of vocabulary knowledge test. In addition, the students assigned to the experimental group scored higher than the control group in depth of vocabulary knowledge test.

Keywords: Vocabulary, Breadth of Vocabulary Knowledge, Depth of Vocabulary Knowledge, Strategy Training

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1. Introduction

Different scholars raise two important points regarding vocabulary knowledge: vocabulary breadth and depth. Vocabulary breadth is described as the amount words a student understands whether he/she know the words deeply or not (Daller et al., 2007 p.7). Vocabulary depth has a more comprehensive definition. Depth of knowledge is concerning how learners create a link between words; regarding how students associate and interconnect one word with another and whether they recognize the limited use of words according to register and context (Moghadam et al., 2012).

There are two common terms in vocabulary study: receptive vocabulary and productive vocabulary. In the present study, receptive vocabulary was studied because students' vocabulary knowledge was measured by letting students read tests and answer them. Receptive vocabulary knowledge stands for the capability to identify and understand a word in listening or reading, while productive vocabulary knowledge is used to produce words, beyond comprehending, in speaking or writing (Boone & Wilde, 2023).

The term 'language learning strategy' has been defined by many scholars but there is no common definition. Even though language study strategies have been explained by numerous well-known authors in the profession, there is no complete agreement regarding the definition and categorization of strategies. Oxford (1990) defines it as particular measures employed by the

learner to make learning simpler, quicker, further pleasant, further autonomous, further efficient, and further applicable to novel circumstances. Language learning strategies stand for the procedures and tasks employed by language students to study or utilize a language more successfully (Rose, 2015). In general, many of the definitions stress the use of receptive and productive skills of language in autonomous way.

Vocabulary learning strategies training is originated from the general area 'learning strategies'. As an instructor who has taught for the past 12 years, mostly in universities, the present researcher has always had questions about the reasons behind the gap of English language academic performance of his students. English language teaching scholars also began to see the importance of individual variation in language learning (Brown, 2007). We see some students achieve faster and better academically while other students achieve sluggishly because of what is commonly called learning strategies. Language aptitude and motivation constitute factors that impact the speed of second language attainment. But how does their effect function? One option is that they affect the nature in which learners use learning strategies (Ellis, 1997).

It seems customary to hear many individuals complain about their inability to comprehend English speeches and texts referring to the difficulty of the vocabulary. Regarding this point, studies (e.g., Laufer, 1997) confirm that students think the lexical shortage as the key problem specifically when they are studying to read and that the need to comprehend can explain their fascination towards lexis. Strengthening the lexical knowledge can guide enhanced reading comprehension and reduced reading mistakes and spelling errors (Incognito et al., 2023). Therefore, the acquisition of lexis has become a question of interest to applied linguists since then. The complexity of vocabulary acquisition is high to ESL/EFL learners especially if their mother tongue has a structure which is very different from their target language.

Concerning this issue, if a word has sounds that exist in the mother tongue, follows usual spelling patterns, is a borrowed word in the mother tongue with approximately identical meaning, in shape with more or less identical grammatical pattern as in the mother tongue, with identical collocations and limitations, then the studying load will be very low (Nation, 2001).

For students whose mother tongue is strongly connected to the language which is not their first language, the study load of most words may be little. Nevertheless, for students whose mother tongue is not connected to the language they are learning, the study load is big.

The other problem regarding vocabulary learning is the depth nature of 'knowing a word'. That means, when we say that a person knows a word it embraces more than knowing the meaning of that word. Nation (2000, p.40) specifically lists "the aspects of word knowledge as form, meaning and use". However, according to the experience of the researchers, many students are not good at deeply understanding the meaning of words.

Pertaining to the influence of vocabulary strategy instruction in students' language skills, some research outcomes show a rational degree of achievement, whereas other studies illustrate only inadequate success, or even learner opposition (Schmitt, 1997). In his investigation of school-oriented research works, McDonough (1995) concludes that enhancements from strategy instruction are low, culturally reliant, and demonstrated only in a few situations. In contrast, Stoffer (1995) states strategy training was the solitary excellent forecaster of the employment of vocabulary-learning strategies; whereas, Hulstijn (1997) quotes several research works that illustrated achievement in the successful employment of a specific strategy of creating a link between the current knowledge and the previous knowledge of vocabulary, an association between the new word and previously known picture and sound, after strategy instruction. Nation (2001) sums up related

results for the strategy of contextual meaning guessing. All these conflicting research results indicate that many more studies are needed regarding training on vocabulary learning strategies. Of course, it could be logical to conclude that the area was not well-researched and there was a need for further studies. Therefore, the present researcher believed that the present study can contribute new knowledge to the ELT community, on this specific issue.

The first important contribution of this study would be the basic knowledge on the result of vocabulary learning strategies training on vocabulary knowledge, and vocabulary strategy exercise of English as Foreign Language students. As it was discussed in the literature review, there was an argument on whether language strategy training improves students' language skills; therefore, this study could contribute to this scholastic debate. The results can also help curriculum designers to design, according to the outcomes of this study, 'Vocabulary Learning Strategies' lessons by integrating them with reading comprehension skills and incorporate it into *Communicative English Skills* courses. The findings could also raise students and teachers' awareness concerning the benefits of vocabulary learning strategies. Fourthly, English language instructors might get a good understanding about vocabulary learning strategies training and could improve their classroom practices. In addition, future researchers who would be interested in this less-researched topic might use this study as a benchmark. This study required to respond to the subsequent research questions:

1. Is there any significant difference in breadth of vocabulary knowledge between students who receive vocabulary learning strategies training and those who do not receive the training?

2. Is there any significant difference in depth of vocabulary knowledge between students who receive vocabulary learning strategies training and those who do not receive the training?

2. Review of Literature

This section mainly addresses the issues associated with the aims of the research: vocabulary, teaching and learning vocabulary, vocabulary knowledge, assessing vocabulary knowledge, vocabulary study strategies and vocabulary learning strategies training. Besides, the researcher's arguments are presented followed by the debates of scholars of different fields; an attempt is made to put the arguments for and against each agenda, together with this researcher's arguments and reflections.

2.1 Teaching and learning vocabulary

Different scholars (e.g., Carter, 1998; Schmitt, 2000) recommend the best possible ways to learn and teach vocabulary to make learners rich in words and able to understand written texts and lectures and communicate their ideas in written and spoken language. Carter (1998) discusses the disparity between teaching vocabulary for input skills and teaching vocabulary for output skills. He states particular instruction techniques are more appropriate for comprehension than for production and it is inversely true. For instance, as an instruction method cloze procedure inspires skills of lexical understanding, particularly in reading. He also advises primary school teachers to focus on a variety of techniques to support memorization. Specifically, teaching techniques which encourage imagistic and picturable associations across the L1 and L2 can be helpful. The other point advised by this author to elementary language learners is to have regular suggestion to the concept of few words being more essential than others. Word lists should be evaluated in accordance with theories of core vocabulary.

Carter (1998) suggests that specific attention be paid to phonological forms to support remembering in the word stock. It is required that a psycholinguistic insight of words as discrete forms should be settled with more pragmatic, social meetings with words in discourse settings of actual practice. Carter (1998) states that advanced students should give attention to production so emphasis should be given to teaching of words in a network of semantic associations. The vocabulary instruction in semantic sets or grids is considered as helpful at this point.

Vocabulary knowledge

Knowing a word in a second or foreign language can have the following key features:

1. knowing the way to employ it effectively and acquiring the capacity to remember it for lively utilization, even though for few reasons only receptive knowledge is required and few words for few learners are only ever known receptively
2. recognizing the possibility of meeting the term in one of the situations- verbally or text-wise or in the two situations cooperatively
3. Being aware of the sentence structures into which the word can be inserted and the fundamental shapes and derivation which can be formed from it
4. Being cognizant of the associations it agree with other words in the language and in addition with connected words in a mother tongue
5. understanding the comparative center of the word in addition its more noticeable pragmatic and discoursal functions and its style-stages
6. Being familiar with the varied definitions linked with it and, frequently in a joined way, the diversity of its collocational outlines

7. Being acquainted with terms as element of or completely as common sayings properly rehearsing to replicate—and adjust—when the instance desired (Carter, 1998)

Assessing vocabulary knowledge

Schmitt (2000) states there is no one common way of measuring one's vocabulary knowledge; however, Nation's (1990) test can be considered as relatively the regular exam. It is named as the Vocabulary Levels Test, first devised by Paul Nation (1990). Instead of offering a particular approximate calculation of the whole vocabulary size, it estimates knowledge of words at four frequency stages: 2,000, 3,000, 5,000, and 10,000. It also has a particular stage for academic English words." (Schmitt, 2000, p. 174). However, he criticizes the Checklist tests by Paul Meara alone and with one of his colleagues. These scholars have produced a manuscript of pencil-and-paper checklist tests called the EFL Vocabulary Tests (Meara, 1992), a business automated edition known as the Eurocentres Vocabulary Size Test (Meara & Jones, 1990), besides a sequence of single-level computerized exams known as the LLEX exams (Meara, 1994). He further states, in the Checklist tests, words to be studied are written on a register and students are simply expected to ensure if they understand-them or not. Hence, the participants might miscalculate their vocabulary knowledge and choose words they actually do not know.

The Vocabulary Levels Test produced by Schmitt et al. (2001) has been adapted for this study. The levels test obtains its name from the reason that isolated parts compute students' knowledge of vocabulary from lots of separate frequency levels. Accordingly, it is able to offer a summary of a student's word knowledge, is stead of a particular numerical educated guess of general word knowledge. The levels dealt with are the 2000, 3000, 5000

and 10000 common stages. Moreover, there is a part for educational vocabulary.

Moreover, a receptive vocabulary depth test was utilized because the above vocabulary breadth test was not adequate to have a full understanding regarding the vocabulary capacity of the learners. The Word Associates test which was selected by this researcher to be set for the research purpose was the revised form of Read's (1998) Word Associates Test. It focused on the notion of vocabulary connection, intended to evaluate two features of depth of word knowledge: (1) vocabulary meaning, specifically multiple meanings and meanings, and (2) vocabulary collocation. It consists of eight choices inside two tables for every studied term, 4 choices inside every box.

Vocabulary learning strategies

English language experts classified also all the major language skills (speaking, listening, reading and writing) strategies and the language items (vocabulary and grammar) strategies. Given the emphasis of this research is on vocabulary, vocabulary learning strategies are emphasized. It is challenging to come up with all-inclusive vocabulary learning strategies. One of the reasons may be the following as put by Schmitt (1997): the procedure of studying second/foreign language words is a cognitive procedure and this development linked with the broader language study and output strategies. Hence, it is pretty complex to arrive at all-agreed classification of vocabulary learning strategies.

Like language learning strategies, vocabulary learning strategies are grouped differently by many authors. Among these scholars, Schmitt (1997) and Nation (2001) have widely known VLSs taxonomies. Schmitt (1997) produced a classification of word study strategies according to an inclusive language learning strategies' classification produced by Oxford (1990),

incorporating memory, cognitive, compensation, metacognitive, affective, and social categories.

The next is the strategy categorization set by Schmitt (1997): Group 1: Strategies for the detection of unfamiliar word's meaning • Determination Strategies: investigating form class, analyzing attached words to the base words and base words, looking for mother tongue equivalence, examining any accessible pictures or gestures, guessing meaning based on contextual clues and referring a dictionary (within a language itself or from one language to another language) • Social Strategies: requesting the instructor for a similar meaning, another expression, or mother tongue translation of unfamiliar word and inquiring school friends for meaning. Group 2: Strategies for internalizing a word after it had been studied earlier • Social Strategies: learning and exercising definition in a team and communicating with a mother-tongue speaker. • Memory Strategies: associating the term to a prior individual knowledge, connecting the word with its coordinates, relating the word with its similarities and opposites; using semantic maps, picturing the word's spelling in mind, picturing the word's meaning in mind, employing two stage mnemonic technique, categorizing words collectively to learn them, learning the spelling of a word, studying an familiar word by voice projection and employing physical deeds when studying a word • Cognitive Strategies: oral reverberation; transcribed reverberation; word lists; placing English stickers on concrete materials and registering word meanings on exercise book •Metacognitive strategies: utilizing English-language broadcasting (records, cinemas, broadcasts, etc.); sitting for vocabulary exam; omitting unfamiliar term and keeping on learning vocabulary.

Training of vocabulary learning strategies

Cohen (2003) states the main effective method to develop student knowledge is to provide strategy instruction. He adds that strategies-based

training is a learner-centered way of instruction and it can incorporate both covert and overt combination of strategies into the training content. In his book, it is explained that in a distinctive strategies-based training classroom, instructors give details and reproduce strategies, consider learners' background knowledge, guide deliberations about strategies, motivate learners to attempt using different strategies and incorporate strategies into coursebooks. This implies that we are expected to include strategy instruction inside classrooms; however, it may be asked how successful such instruction is.

2.2 Training of vocabulary learning strategies and vocabulary knowledge

Concerning the utilization of training of vocabulary learning strategies to develop the vocabulary knowledge of English language learners, many scholars agree on its usefulness. Schmitt (2000) advises English language teachers that it is possibly essential to consider incorporating a vocabulary learning strategies section to a vocabulary program. He added that a teacher cannot lecture all the words learners should know, and even the input produced by extensive reading has its weaknesses; learners will finally require to successfully control their own vocabulary study. But Schmitt advises that successful instruction must be customized to an instructor's specific condition, considering the age, motivation, proficiency, and desires of his/her trainees. Finally, he discusses that students gradually developed into employing varied strategies at various times of their life, so it is most likely logical to introduce them to different strategies and let them make their mind up which ones are appropriate for them.

There are some studies which show the results of training of vocabulary learning strategies on trainees' word progression. One of these research works is the one conducted by Namaghi and Rajaee (2013). This research designed to compare the discrepancy result of vocabulary strategy instruction

and conventional approach of offering vocabulary training. Trainee t-test for independent and non-independent samples was employed to examine the data. The findings indicated that strategy instruction resulted in considerably with enhanced results ($t = 4.83$, $p = 0.0001<0.05$).

The other study was done by Llamosas (2011). One of its objectives was to identify if there was a disparity in the stages of enhancement showed by the treatment group, after the employment of the "Vocabulary Improvement Program", in contrast to the comparison group, through the use of after the training exam to both treatment and comparison groups. The results of the experiment illustrated that the employment of vocabulary teaching and vocabulary learning strategies, for instance as those presented in the VIP Program, shows improvements in the English words meaning study in beginner EFL learners. The experiment suggested that even though there are lots of vocabulary study strategies which are available in past and newly published books, the instructor is expected to identify suitable strategies based on level, type of learners and studied vocabulary.

The third study was conducted by Banisaeid (2013) to weigh against the outcome of memory and cognitive strategies instruction on words study of average ability cluster of Iranian learners of English as a foreign language. The findings of independent samples t-test indicated no major disparity between the outcome of cognitive and memory strategy instruction on intermediate EFL students' vocabulary study. However overall, the result recommends that memory strategies instruction and cognitive strategy instruction correspondingly improve students' vocabulary knowledge.

There was also a research conducted by Rasekh and Ranjbary (2003). The research was aimed at contributing to the concern of strategy instruction. They examined the impact of metacognitive strategy instruction via the employment of overt strategy training on the improvement of vocabulary

knowledge of EFL students. To achieve the aim of the research two groups of EFL language students at intermediate language performance stage were arbitrarily allocated to a control and treatment group. These two groups received instruction on vocabulary learning strategies for 10-weeks. Nevertheless, only the treatment group took metacognitive strategy instruction throughout the term. The instruction model employed was in accordance with the structure for direct language learning strategies training recommended by Chamot and O'Malley (1994). The research found that overt metacognitive strategy instruction has a substantial progressive influence on the vocabulary education of English as Foreign Language students.

Here is also a recent study conducted by Dobakhti et al. (2020) regarding the outcome of Rote and Mnemonic Strategies on word study. They found that the participants who received training in strategy of associating unfamiliar word with familiar word through pictures and words, rather than repetition mode of study strategy, had considerably superior scores in vocabulary knowledge than learners who took training in vocabulary strategy in repletion mode of strategy study.

Khazaie and Derakhshan (2024) attempted to compare the effect of online face-to-face synergy and online instruction strategies on students' reading. They found that both online face-to-face synergy and online instruction strategies had a positive effect on reading comprehension. The results marked that, compared to the online instruction strategy; the online face-to-face synergy was meaningfully productive in strengthening the students' reading.

3. Methodology

3.1 Introduction

This segment treats the research design and methodology employed in this article. Specifically, the research design, sampling technique, steps of the

strategy training, data gathering instruments, data collection procedure and methods of data analysis are discussed.

3.2 Research design

As a research design, experimental research design was employed mainly, for all of the research questions of this article need this type of design. In this research, an attempt was made to see the effects of vocabulary learning strategies training on vocabulary knowledge. In this article the independent variable (the intervention) is the training on vocabulary learning strategies and the dependent variables include breadth of vocabulary knowledge and depth of vocabulary knowledge.

Together the control group and the treatment section sat for vocabulary knowledge pretests and post-tests. In between the pretests and post-tests, vocabulary learning strategy training was offered to only the treatment section. Finally, the results of the two sections were compared.

All the two specific objectives of this article were addressed quantitatively- by tests. Therefore, the paradigm employed in this study is called realist (positivist).

3.3 Procedures

3.3.1 Producing the training and training material

The instruction which was offered to the treatment section employed the Oxford (1990) model. This model was chosen because the author is a pioneer in researching on the issue and putting clearly the logical ways of strategy training.

The present researcher served as an instructor and handled both the treatment and control sections of the research work. The researcher offered Communicative English Language Skills I course to the control group but he taught *Communicative English Language Skills I* course and vocabulary learning strategy training to the experimental group to avoid the influence of

extraneous variables that may appear because of the trainers' difference (regarding ability, gender, classroom management …). Moreover, the researcher believed that the training would be effective when it was offered by the person that was studying about the issue instead of training other instructors and let them provide the training.

The vocabulary learning strategy training was offered for 16 hours in 16 weeks (1 hour per week). This time was determined considering the 48 hours (3 credit hours x 16 weeks) offered for Communicative English Skills course in the semester.

The vocabulary strategy training material was produced by integrating the vocabulary lessons incorporated in Communicative English Language Skills I module and the vocabulary learning strategies identified by Schmitt (1997) and renowned vocabulary books of various authors such as Oxford (1990), Nation (2001), Carter (1998) and Takač (2008).

3.3.2 The contents of vocabulary learning strategies training material

The training material begins with the cover page entitled as "Vocabulary Learning Strategies Training Material for First Year Students. The cover page also includes date, and the writer's name and address. The second page is comprised of the table of contents incorporating general objectives of the training material, the two units' topics and subtopics, answer key for the instructor, references and appendices.

The general objectives of the training material are stated as follows. After the completion of this training, learners will be able to:

- discover the meaning of words by guessing from their structural knowledge of the words,
- recognize how to interact with other people to improve their vocabulary knowledge,

- identify how to relate the term to be recalled with particular formerly studied facts,
- recognize the strategies of repetition and using mechanical means to study vocabulary,
- decide which words are worth studying,
- choose the most efficient methods of vocabulary study,
- test themselves on vocabulary knowledge to measure improvement.

The main topic of unit one reads as: strategies for the discovery of a new word's meaning. The subtopics include analyzing parts of speech, social strategies- strategies for the discovery of a new word's meaning and asking the teacher for paraphrase (another expression) or synonym (similar) of a new word.

The main topic of unit two is 'consolidation strategies'. It is followed by the following sub-topics: social strategies, studying word with a pictorial representation of its meaning, memory strategies, associating the word with its coordinates, skipping or passing a new word; other memory strategies- affixes and roots-remembering, parts of speech (remembering), paraphrasing the word's meaning; chunking, using physical action, semantic feature grids, repetition, listening to tape of word lists and putting English labels on physical objects; meta-cognitive strategies, attending English-language broadcasting (tracks, films, newsflashes, etc.) and sitting for vocabulary exams; employing time-interval vocabulary exercise, peg method (memorizing words by associating words with numbers), loci method group words together to study them and using new word in sentences.

At the end of the training, the following contents are incorporated: answer key for the instructor, references, appendix A- the general service list and appendix b- academic words list.

3.3.3 Preparing vocabulary knowledge tests

As part of the experiment, it was essential to give a pre- and a posttest to both the experimental and control groups. Hence, to test the breadth of vocabulary knowledge of the participants, the reviewed type of the VLT, which was initially produced by Nation (1983), then endorsed and advanced by Schmitt, Schmitt and Clapham (2001) as Vocabulary Level Tests (VLT) was used. The test was chosen among all these standardized tests because it was employed as a reliable and valid vocabulary size measure in a number of studies (e.g., Laufer, 1992, 1996; Qian 1999, 2002). The other reason was that, the present researcher found that it seemed easy enough to administer, mark and interpret.

This tool is a vocabulary assessment for evaluating a student's knowledge of vocabulary from a particular stage. It was given both as a pretest and a posttest in order to identify the likely change in breadth of vocabulary knowledge. The test includes 90 items. This test incorporates examining the two thousand, three thousand, five thousand, and ten thousand stages, besides the Academic word index. In this particular research, it was not practicable to examine the ten thousand indexes as the researcher took it beyond the partaking learners' stage. Correspondingly, the Academic vocabulary index was not incorporated as it involves words from the other indexes. This led the researcher to involve only the two thousand, three thousand and five thousand stages which were considered as suitable for first year students of an Ethiopian university and the delimitation of the present research.

Moreover, a receptive vocabulary depth test was utilized in this study because the above vocabulary breadth test wasn't adequate in order to have full understanding regarding the vocabulary knowledge of the learners. The test which was selected by this researcher to be administered for the study purpose was the revised version of Read's (1998) *Version 4 Word Associates Test*. It focuses on the notion of word relationship, produced to evaluate two

features of depth of word knowledge: (1) word meaning, specifically multiple similar meanings and similarity, and (2) word association. It consists of eight choices inside two tables to every studied term, four choices in every table. It was the same test which was given both as a pretest and a post-test in order to identify the performance change in depth of vocabulary knowledge that might be seen. The test incorporates 40 items.

The exam layout which has been maximum used as a depth of knowledge evaluation is likely the Word Associates Format (Schmitt, 2010, p. 210)". The WAT has been adapted and implemented by several academics in their research works (Greidanus & Nienhuis, 2001; Qian, 1999, 2002). In addition, in one of the latest findings (Fan, 2015), the reliability of WAT was .87 in accordance with Kuder-Richardson Formula 21, which was comparatively great.

3.3.4 Identifying setting and the study population

The research was conducted in Addis Ababa University. From the two streams (Social Science and Natural Science) of the university, two groups were randomly selected from Natural Science stream. A section was considered as treatment section whereas the other was used as a control section.

3.3.5 Determining the sample size and sampling technique

The sampling technique employed to choose the university was convenience sampling. Using this sampling technique, Addis Ababa University was selected. The researcher focused on a university, not school level, because the researcher thought that he had a better knowledge on the case of universities; he had been teaching English at various universities since 2008. This university was chosen because the University enrolled students with similar educational background and demographic characteristics that all other universities register across the country. Besides,

the researcher was a part-time instructor of English Language and Literature Department of the university and he could have good access to the treatment class and control class.

Two sections of Natural Stream sections were randomly selected and offered to the English Language part-time instructor (also this researcher) of Communicative English Language Skills I by Foreign Languages and Literature Department of Addis Ababa University. Besides, simple random sampling or lottery method was used to select specific sections. Section 5B was employed as the experimental class whereas section 4B was used as the control group in Arat Kilo campus, Addis Ababa University. First an attempt was made to let all the students in each class participate in the study. However, after letting students take the tests and fill in the questionnaire it was found that the average number of students, 20, was employed for analysis. Before the stage of analysis, 20-25 students in each class participated in taking the tests and completing the questionnaire. As a result, the results of some students were discarded randomly.

3.3.6Assignment of treatment and control sections

The following steps were followed to assign students to experimental and control groups. First, the following pretests were administered: Schmitt et al. (2001) Vocabulary Level Tests to test the learners' breadth of vocabulary knowledge and Read's (1998) The Word Associates Test to test the students' depth of vocabulary knowledge.

Second, the test paper of each student was marked objectively, based on the answer keys of the tests for WAT. Thinking it had had a common answer key for the vocabulary breadth test produced by Schmitt et al. (2001), the researcher had sent an email to Professor Norbert Schmitt; however, he received the following mail "As for the VLT, we did not make an answer key, as we felt that anyone giving the test should be proficient enough in

English to know the answers." Therefore, the researcher of the study produced his own answer key by referring dictionaries and by receiving comments from his Ph.D. candidate friends.

Third, independent-samples t-test was calculated to check if both of the sections had alike performances on each of the vocabulary knowledge and reading comprehension tests. If there had been a significant difference in the tests' scores between the groups, matching the participants would have been done based on their scores. The researcher (trainer) would have ordered the students to change their classes to equate the groups. Fortunately, there were no significant differences between the control and experimental groups regarding the scores in the Vocabulary Levels Test and Word Associates Test. Therefore, this situation made the process of the experiment easy to be carried out.

Finally, the groups were named experimental and control by drawing lots. According to the lot, from Natural Science Stream Arat Kilo Campus, Section 4B class was named as the control group whereas Section 5B was named as the experimental. Thus, this allowed the groups to have equivalent probability of being chosen as treatment or control section. In other words, this randomization helped the researcher to minimize the influence of extraneous variables.

3.3.7Conducting the experiment

The same instructor handled both the treatment and control sections of the research as the researcher believed that this could minimize instructor-related extraneous variables. The vocabulary learning strategy training was offered for 16 hours in 16 consecutive weeks. Students were not informed if the trainees were in the treatment section or in the control section to minimize artificial behavior. This care was taken by the researcher to avoid the Hawthorne effect and the placebo effect.

3.3.8 Administering posttests

The posttests were given to the treatment and control sections in order to examine the effect of vocabulary learning strategies training on the vocabulary knowledge (vocabulary depth and breadth) of university students. The students took the tests by the same invigilator (the researcher) in the same examination rooms and in the same session (morning) in which they took the pretests.

3.3.9 Methods of data analysis

In analyzing the results of the tests, independent samples t-test was calculated to investigate if there was a statistically significant disparity among the treatment and control sections with regard to vocabulary knowledge. Paired samples t-test was also applied on the SPSS version 24 to assess if there was a statistically significant variance between the pre- and posttest mean results of the learners in the treatment and control section regarding their vocabulary knowledge. T-test was employed because the variables of the research are continuous- vocabulary test scores.

3.3.10 The pilot study

Prior to studying the main research, the pilot study was carried out. The aim of the pilot study was to evaluate the feasibility of the study procedure. Specifically, an attempt was made to assess the effectiveness of the instruments, sampling technique, research design and data analysis of this research. The number and type of research objectives, instruments, participants, research design and analysis in the pilot study were the same as those in the plan of the main research in many cases.

The first input gained in relation to vocabulary knowledge tests was that some options of the questions had not been arranged properly; nonetheless, they were later put appropriately. However, the significant issue is related to answer key of the tests. First, thinking it had had a common answer key for

the vocabulary breadth test produced by Schmitt et al. (2001), the researchers sent an email to Professor Norbert Schmitt; however, he received the following mail "As for the VLT, we did not make an answer key, as we felt that anyone giving the test should be proficient enough in English to know the answers." Therefore, the researcher of the study produced his own answer key by referring to dictionaries and by receiving comments from his PhD candidate friends. The researcher also sent an email to John Read for an answer key for the vocabulary depth test (Word Associates Test). Luckily, the author immediately sent the answer key to this researcher accompanied by a short note "Thank you for your enquiry. You are welcome to use one of my WATs if it is appropriate for your research. I am not sure which test you are referring to, so I am sending two tests and answer keys." Finally, the researcher could use the answer key of Version 4 WAT and marked students' test papers.

4. Results and Discussion

4.1 Independent samples t-test result of vocabulary levels (vocabulary breath knowledge) pretest

To compare the breadth of vocabulary knowledge difference between learners in the treatment section and control section, the two sections of learners took a standardized vocabulary levels test before the treatment section students received instruction of vocabulary learning strategies. The pretest enabled us to know the probable breadth of vocabulary knowledge change brought about by the training. The outcome of pretest related to the control and treatment sections in breadth of vocabulary knowledge is presented below.

Table 1

Independent Samples T-Test Results for Vocabulary Levels (Vocabulary Breath Knowledge) Pretest

Group	No.	Mean	SD	df	T	P

Treatment	20	158.6	33.40	38	.010	.986
Control	20	158.5	31.96	37.92		

Table 1 illustrates that the mean score related to vocabulary levels pretest of the treatment section was 158.6 while the mean score of the control section in the pretest was 158.5. The standard deviation of the treatment section was 33.40 and the standard deviation of the control section was 31.96. Moreover, the table shows that the t-value of the two sections was .010 and the p-value was .986 indicating no significant disparity among the treatment and the control sections in vocabulary levels (breadth of vocabulary knowledge) pretest ($t = .010$, $df = 38$ for the control section and 37.92 for the treatment section, $p > 0.05$).

The results clearly showed that it was scientifically correct to begin the experiment because the treatment and control sections were corresponding in breadth of vocabulary knowledge.

4.2 Independent samples t-test results for word associates (depth of vocabulary knowledge) pretest

Before answering one of the research questions, that is, whether there is significant difference in depth of vocabulary knowledge between students who receive vocabulary learning strategies training and those who do not, it was significant to show that there is no significant difference in breadth of vocabulary knowledge between learners assigned to experimental and control groups. Therefore, independent samples t-test was computed and the following result was found.

Table 2
Independent Samples T-test Result for Word Associates (Depth of Vocabulary Knowledge) Pretest

Group	No. of Students	Mean	Standard Deviation	DF	T-value	P-value
Treatment Section	20	121.65	17.42	35.39	-.40	.19
Control Section	20	119.65	13.19	38		

Table 2 shows that the pretest mean total of the treatment section was 121.65 while the mean total for word associates pretest in the control section was 119.65. The standard deviation of the treatment section was 17.42 and the standard deviation of the control section was 13.19. In addition, the table presents that the t-value of the two sections was -.40 and the p-value was .19, showing no significant variance between the control and treatment section in vocabulary levels (breadth of vocabulary knowledge) pretest ($t = -.40$, $df = 38$ for the control section and 35.39 for the treatment section, $p > 0.05$). This amount clearly specifies that it was sound to conduct the experiment because the control section and treatment section were equivalent in depth of vocabulary knowledge.

4.3 Independent samples t-test result of vocabulary levels posttest

1. Is there any significant variance in breadth of vocabulary knowledge between students who receive vocabulary learning strategies training and those who do not receive the training?

To reply the primary research question of this research, after the vocabulary levels pretest of the two groups and the vocabulary learning strategies training for the experimental group, a vocabulary levels posttest was given to both experimental and control groups. Finally, an independent t-test was run and the subsequent result was found.

Table 3
Independent Samples T-Test Results for Vocabulary Levels Posttest

Group	No.	Mean	SD	df	T	P
Treatment Section	20	169.7	7.15	19.84		
Control Section	20	148.7	47.94	38	-1.94	.001

As presented in Table 3, the treatment section students scored an average score of 169.7 in vocabulary levels test while the mean score of the control

section students was 148.7 in the test. The standard deviation of the experimental section was 7.15 but the standard deviation of the control section was found to be 47.94. The t-value and p-value were found to be -1.94 and .001, respectively.

As Table 3 clearly shows, the treatment section achieved significantly greater in vocabulary levels test (vocabulary breadth) than the control section students (t = -1.94, df = 38 for the control section and 19.84 for the treatment section, $p < 0.05$). This could be related to the vocabulary learning strategies training offered to the experimental group learners helping them to improve their breadth of vocabulary knowledge. The previous studies also show that when students are acquainted with various vocabulary learning strategies, their vocabulary knowledge also increases. Therefore, according to the findings, it can be concluded that vocabulary learning strategies training had an encouraging effect on students' breadth of vocabulary knowledge. The effect size was moderate (Cohen's d: .76). The data in the table confirms the alternative hypothesis as there is a statistically significant disparity in breadth of vocabulary knowledge among students who took vocabulary learning strategy instruction and those who do not. In accordance with the present results, previous studies (Amirian & Noughabi, 2018; Heidari et al., 2012) also revealed that vocabulary strategies instruction had a progressive impact on students' vocabulary knowledge; those who took training of vocabulary learning strategies outclassed the control section, who had not taken any particular strategy training.

4.4 Independent samples t-test result of word associates (vocabulary depth) post-test

2. Is there any significant variance in depth of vocabulary knowledge between students who receive vocabulary learning strategies training and those who do not receive the training?

The purpose of running this independent samples t-test was to respond to the above second research question. Followed by the pretest and the training, a posttest of word associates was applied to students of treatment and control sections. By utilizing the marks of this posttest, the researcher computed independent samples t-test and the breadth of vocabulary knowledge of the two groups were compared as follows.

Table 4
Independent Samples T-Test Result for Word Associates (Vocabulary Depth) Posttest

Group	No.	Mean	SD	df	T	P
Treatment	20	139.05	8.56	30.16		
Control	20	117.8	15.02	38		
					-5.49	.039

The above table highlights the mean difference in the word associates test; the mean score was 139.05 for the treatment section learners while it was 117.80 for the control section students. The computed standard deviation for the treatment section was 8.56 but the computed standard deviation of the control section was 15.02. The t-value and p-value were also calculated for both control and treatment sections to be -5.49 and .039, respectively.

From the above data, it is evident that there is a statistically significant disparity among the treatment section and control section; the treatment section outperformed the control section in word associates (vocabulary breadth) test ($t = -5.49$, $df = 38$ for the control section and 30.16 for the treatment section, $p < 0.05$). This significant variation was most probably associated with the advantage of vocabulary learning strategies training offered to the treatment section. The students could utilize the different vocabulary learning strategies they learned during the training to study lots of words and increase their vocabulary knowledge. From the results presented in Table 4, it could be summed up that training of vocabulary learning strategies instruction had a constructive effect on students' breadth of

vocabulary knowledge. The effect size was strong (Cohen's d: 1.80). This result is in line with the alternative hypothesis: there is statistically significant variation in depth of vocabulary knowledge between learners who receive vocabulary learning strategy training and those who do not take the training. It further supports the idea of Ostovar-Namaghi and Rajaee (2013), who also found that the cluster which obtained vocabulary strategy lesson expressively outdid in vocabulary knowledge the cluster which studied vocabulary through traditional tasks suggested by the course book.

4.5 Paired samples t-test result of the treatment and control sections in vocabulary levels (vocabulary breadth) test

The primary specific aim of this research work, to examine the influence of vocabulary learning strategy training on the breadth of vocabulary knowledge of university learners, was answered by employing the following test and procedure.

A standardized vocabulary breadth test adopted from Schmitt, Schmitt and Clapham (2001) Vocabulary Level Tests was employed as a pretest and posttest for the control section and treatment section. After the completion of data gathering process, a paired samples t-test was operated to know whether the control section students, after taking only general English language course and the treatment section students, after taking the general English course and receiving the vocabulary learning strategies training, significantly improved their breadth of vocabulary knowledge. The total scores of paired samples t-test are provided as follows.

Table 5

Paired Samples T-test Result for the Treatment and Control Sections in Vocabulary Levels (Vocabulary Breadth)

Group			Pretest	Posttest			df	t	p
	No.	Mean	SD	No	Mean	SD			
Treatment	20	158.5	31.96	20	174.8	2.11	19	-2.26	.03
Control	20	158.6	33.4	20	148.7	47.94	19	1.28	.21

Table 5 shows that the treatment group's mean score in vocabulary breadth pretest were 158.5; however, the group scored 174.80 in the vocabulary breadth posttest. This experimental group's standard deviation was 31.96 in the pretest but the group's standard deviation was computed to be 2.11 in the posttest. The t-value and p-value of the group was recorded as -2.26 and .03 respectively. This means the p-value was less than the cut-off point (0.05). Interestingly, the treatment section learners scored considerably greater on the vocabulary levels posttest than on the vocabulary levels posttest (t-value: -2.26 and p-value: 0.03). This positive performance change was most probably brought about by the vocabulary learning strategies training the group received. The effect size was moderate (Cohen's d: .95).

Moreover, Table 5 discloses that the mean total of the control section in vocabulary levels pretest was 158.60 and the mean total of the section in vocabulary levels posttest was 148.7. The control section's standard deviation in the pretest was 33.2 while the group's standard deviation in the posttest was 47.94. The t-value of this control section was calculated to be 1.28 and the p-value was found to be .21. Based on these results, we can conclude that the control group students did not have a better performance in their vocabulary breadth posttest compared to their vocabulary breadth pretest (t-value: 1.28 and p-value: .21).

4.6 Paired samples t-test result for the treatment and control sections in word associates (vocabulary depth) test

The goal of this test was to provide the answer to the second specific research objective concerning the outcome of vocabulary learning strategy instruction on the depth of vocabulary knowledge of university learners.

In line with this purpose, a standardized Read's (1998)- Version 4 Word Associates Test was employed as a pretest and posttest and an attempt was made to identify performance change in depth of vocabulary knowledge that

could be brought about by the vocabulary learning strategies training. The result of the paired samples t-test is highlighted as follows.

Table 6

Paired Samples T-Test Results for the Treatment and Control Sections in Word Associates (Vocabulary Depth)

Group	Pretest			Posttest			df	T	P
	No.	Mean	SD	No.	Mean	SD			
Treatment section	20	121.65	17.42	20	130.2	11.7	19	-2.27	.03
Control section	20	79.25	18.20	20	80.25	10.47	19	-.13	.89

As displayed in Table 6, the treatment section students scored 121.65 as mean result in the word pretest; nevertheless, they scored 130.20 in the posttest. The treatment section's standard deviation in the pretest was 17.42 though its standard deviation in the post-test was found to be 11.70. The t-value is -2.27 and the p-value is 0.03. Based on this result, there is an important variance between the pretest and posttest marks of the treatment section in vocabulary depth (t-value: -2.27, p value: 0.03). This implies that the treatment section considerably developed their depth of vocabulary knowledge after receiving the training on vocabulary learning strategies. Therefore, based on this result, we can conclude that vocabulary learning strategies training helps university students improve their vocabulary knowledge. The effect size was moderate (Cohen's d: .73).

In addition, according to Table 6, the average score of the control section in the pretest of vocabulary depth is 79.25 and they scored 80.25 in the posttest. As presented in the table, the standard deviation of the control section in the pretest is 18.20 and its standard deviation in the posttest is 10.47. The table reveals that the t-value of the group is -.13 and the p-value is .89. The data shows that there is no substantial variation among the pretest and post-test marks of the control section in the word associates (vocabulary depth) test.

5. Conclusion

The general intention of this study was to examine the outcome of vocabulary learning strategies training on vocabulary knowledge of university students.

A pretest of vocabulary breadth test known as Vocabulary Level Tests produced by Schmitt et al. (2001) was employed for both the experimental and controlled groups. The purpose of this pretest was to identify whether the control and experimental group had equivalent performances in vocabulary breadth. The marks of independent samples t-test indicated that the students assigned to the experimental and control groups had similar performances in breadth of vocabulary knowledge on the pretest.

A pretest of vocabulary depth called Word Associates Test Version 4 produced by Read (1998) was given to both the treatment and control sections. The aim of this pretest was to find out whether the control and experimental section had equivalent performances in depth of vocabulary knowledge. The marks of independent samples t-test exhibited that there was no statistically substantial variation between the two sections showing that the two groups had equivalent performances in depth of vocabulary knowledge and it was logical to carry out the experiment.

The first specific purpose of this research was to examine the influence of vocabulary learning strategy instruction on the breadth of vocabulary knowledge of university learners. After completion of the vocabulary learning strategy instruction, the same vocabulary breadth test known as VLT, which was also taken as pretest, was completed by first year AAU students. The objective of the posttest was to examine whether the training led to a statistically considerable variation among the control and treatment sections in breadth of vocabulary knowledge. To check the difference, independent samples t-test was run and the following result was found: the

treatment section recorded greater than the control section learners in breadth of vocabulary knowledge. There was a statistically considerable variation among the control section and treatment section in vocabulary breadth because the p-value (sig. value) was lower than the cut-off point (.05), p>.001. Moreover, the effect size was moderate (Cohen's d: .76). The data in the table confirms the alternative hypothesis that there is a statistically considerable variation in breadth of vocabulary knowledge among the learners who took vocabulary learning strategy instruction and those who do not.

The second specific objective of this research was to examine the effect of vocabulary learning strategy training on the depth of vocabulary knowledge of university students. After completion of the vocabulary learning strategy training, the same vocabulary depth test known as Word Associates Test, which was also taken as pretest, was completed by first year AAU students. The objective of the posttest was to examine whether the training brought about a statistically considerable variation among the control and treatment section in depth of vocabulary knowledge. To check the difference, independent samples t-test was run and the following result was found: the students assigned to the treatment section scored greater than the control section in word associates test as the posttest. There was a statistically considerable difference among the control and treatment sections in depth of vocabulary knowledge because the p-value (sig. value) was less than the cut-off point (.05); it was .039. In addition, it was noted that instruction of vocabulary learning strategies had a positive effect on students' breadth of vocabulary knowledge. The effect size was strong (Cohen's d: 1.80). The result is matched with the alternative hypothesis: there is a statistically noteworthy variation in depth of vocabulary knowledge between the students who took vocabulary learning strategy instruction and those who did not.

6. Recommendations

As mentioned above, since the trainees were acquainted with a variety of vocabulary learning strategies in strategy training, they showed improvement in their vocabulary knowledge. Similar positive effects were also found by other researchers as it was discussed in the results and literature review sections. Therefore, curriculum designers and material developers are recommended to integrate varied vocabulary learning strategies in Communicative English Skills courses. Instructors are also supposed to demonstrate the importance of using different vocabulary learning strategies to develop vocabulary knowledge. Future researchers can examine the influence of vocabulary learning strategies instruction on other language skills.

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