Alternative Vocabulary Learning Approaches in EFL Setting: Bottom-up or Top-down?

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The present study aimed at investigating the effectiveness of bottom-up (BU) and top-down (TD) approaches on EFL learners' vocabulary learning, the difference in the effects of the two approaches depending upon their level of vocabulary proficiency, and their perception of the approaches. For this study, 122 college students were divided into two approach groups and to two levels in each group depending upon their level of vocabulary knowledge. They were trained with either of the approaches for one semester. The results were that 1) there was no statistically significant differences between the BU and TD approaches, even though the two approaches were effective to improve the students' vocabulary knowledge; 2) high-level students failed to show any significant differences between the two approaches in the two tests, whereas low-level students in the BU group performed significantly better than those in the TD group in the production test; and 3) they preferred the BU or TD approach to the traditional method in vocabulary learning, and they listed some advantages and disadvantages of the approaches.

Key words: vocabulary learning, bottom-up approach, top-down approach

1. INTRODUCTION

Vocabulary learning has always been a major issue to language learners since acquiring new words is believed to be the basis of language learning (Chin, 2002; Hedge, 2000;

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Kwon, 2004; Pae, 2016). Especially, the development of lexical knowledge has been recognized as a prerequisite for L2 learning in that highly developed vocabulary knowledge could lead L2 learners to be successful in interacting with authentic materials (Chin, 2002; Dubin, 1989; Graves, Slater, & White, 1989; Nation & Coady, 1996).

Over the past decades, a number of research has been conducted with the purpose of validating the essential role of vocabulary learning in ESL/EFL contexts (Helman, 2008; Scott, Nagy, & Flinspach, 2008; Manzo & Manzo, 2008; Nation, 2013). Their main focus was on a variety of cognitive and affective factors such as learning strategies, task involvement, modes of input, attitude, or motivation that are reportedly conducive to learners' vocabulary achievement. Many researchers and practitioners have concurred with the view of the key role of vocabulary knowledge in L2 acquisition, and have struggled to come up with practical and effective vocabulary learning/teaching methods that can be applied to ESL/EFL settings.

In recent years, bottom-up (hereafter, BU) and top-down (hereafter, TD) processing approaches, which have long been well-known instructional techniques in L2 learning, were introduced to vocabulary learning as an alternative learning strategy to the traditional way—for instance, acquiring only a denotative meaning of a word. It is maintained that explicit vocabulary learning using processing strategies such as BU and TD helps L2 learners to improve L2 competence in general as well as lexical knowledge (Read, 2004; Sonbul & Schmitt, 2010). In other words, learners need an opportunity for expanding the depth of vocabulary knowledge through a series of process from denoting meaning of a word to understanding its usage in larger contexts such as sentences, or vice versa; then, they may obtain meaningful outcomes in language use.

However, there is few empirical evidence to support the effects of the BU and TD approaches and their suitability for L2 learners, particularly in EFL settings. Considering that strategy use such as the depth of processing and determination strategies is directly related to EFL learners' vocabulary achievement (Pae, 2016) and that context-related teaching treatment was much more effective than simple word-list treatment for EFL learners' vocabulary learning (Chin, 2002), there is no doubt that using vocabulary learning strategies such as BU and TD approaches in EFL context is critical to enhance learners' vocabulary proficiency.

When it comes to studies on the role of processing strategies, most of them have been conducted to verify the effectiveness of the strategies to improve listening or reading ability (Field, 2004; Oh & Lee, 2014; Tsui & Fullilove, 1998), while few can be found concerning the enhancement of vocabulary knowledge using the BU and TD approaches (Moskovsky, Jiang, Libert, & Fagan, 2015). That is to say, while the critical influence of vocabulary learning strategies/approaches on the development of vocabulary knowledge has been emphasized, there has, to date, been little empirical evidence on the effectiveness

of the BU/TD processing approaches on vocabulary acquisition. Therefore, considering this research gap, the current study aims at investigating the effectiveness of the BU/TD processing approaches on EFL learners' vocabulary learning, the difference in the effects of the two approaches depending upon their level of L2 proficiency, and their overall perception of the approaches. The research questions are posed as follows:

1. Which approach is effective in vocabulary learning, bottom-up or top-down?
2. Is there any difference in the effects of the bottom-up and top-down approaches depending upon students' level of L2 proficiency?
3. How do students perceive the bottom-up and top-down approaches for vocabulary learning?

2. LITERATURE REVIEW

2.1. What Is an Ideal Way of Vocabulary Learning?

With a greater awareness of the importance of lexical knowledge in language learning in the early 2000s (Decarrico, 2001), the task of vocabulary learning has also been a crucial issue especially in ESL/EFL settings (Hedge, 2000; Kwon, 2004). A plethora of studies have dealt with a variety of aspects of vocabulary that exert great influence on vocabulary learning: vocabulary size, frequency, vocabulary learning strategies, integrated learning with other skills such as reading. In other words, a variety of methods of how to encourage learners to build up vocabulary knowledge effectively has been constantly studied over the past decades.

For example, it has been encouraged for vocabulary learners to be aware of connotative meaning from authentic sources in the target language as well as understand referential or denotative meaning of a word (Hedge, 2000). That is, they need to be exposed both to word meanings and associations through experiencing a wide range of texts for meaningful vocabulary learning. Decarrico (2001) also asserted that "knowing a word" is more than knowing its meaning, parts of speech, word family, and other associations. He put particular emphasis on the necessity of contextual learning, including collocations and lexical phrases associated with their specific discourse functions.

Schouten-van Parreren (1989) also echoed the importance of "contextualization," in vocabulary learning that remembering a word highly relies on the depth of processing: inferencing the meaning of a word from context and word form, confirming it through looking up referential sources, and analyzing its word form comparing others already perceived. Here comes the possibility of the application of bottom-up (BU) and top-down

(TD) approaches to vocabulary learning, the approaches that frequently mentioned in receptive skill learning such as listening and reading comprehension (Field, 2004; Tsui & Fullilove, 1998). The approaches might enhance L2 learner's retention of a word, contributing to retrieving the word from memory and producing it automatically, using a meaningful and deep vocabulary learning process (Hedge, 2000; Lewis, 2002; Moskovsky et al., 2015). Therefore, especially for EFL learners, the effectiveness of the BU and TD approaches needs to be verified as an alternative vocabulary learning strategy to traditional one that have learners memorize a list of words one by one presented by the teacher.

2.2. Bottom-Up and Top-Down Approaches in Vocabulary Learning

In the late 1990s, much research on the processing strategies such as bottom-up (BU) and top-down (TD) in L2 learning has been undertaken (Carrell, 1988; Carrell & Eisterhold, 1983; Jensen & Hansen, 1995; Rost, 1990; Smith, 1971), particularly related to receptive skills—listening and reading. Craik and Tulvig (1972) shared the view of the necessity of the depth of processing that would make "input" become "intake" in learning vocabulary since the processing activates learners' working memory for processing the meaning of a word. Hedge (2000) added that there are many factors affecting vocabulary learning; some are frequency, pronunciation related with input, the way to be presented to learners, while others are depth of processing with intake from storing new words in their mental lexicon to retrieving and producing them as necessary.

BU and TD processing are widely known as well-established strategies to process and organize information, and also introduced to language processing (Moskovsky et al., 2015). In fact, BU processing, which is also called "data-driven" processing, is defined that it has to do with decoding a text from the smallest units (sound or letters), gradually moving upward to larger ones to construct meaning such as sentences. On the other hand, TD processing, also known as "concept-driven" processing, involves understanding language with schematic knowledge that works from the text structure to lower-ranked elements (Celce-Murcia & Olshtain, 2001; Hedge, 2000; Jay, 2003; Matthews, 2007; Shohamy & Inbar, 1991).

In terms of the two forms of language use, perception and production, BU processing seems to be closely related with language perception by its nature, which should be processed from lexical aspects, step by step, to conceptual-semantic content. On the other hand, TD processing, starting with higher-ranked units—for example, sentences or contexts—down to grammatical and lexical structures, appears to play more roles in language production (Celce-Murcia & Olshtain, 2001; De Bot, Paribakht, & Wesche, 1997). With regard to the role of the two processing, however, Sun (2002) contended that mental processing generally involves both BU and TD, so neither BU nor TD is likely to

be responsible for just one type of language use (De Bot et al., 1997).

Early in the years, a number of studies provided evidence of superiority of TD processing, considering that the more schemata L2 learners bring to a text, the better they understand the text, which is reportedly a characteristic skillful learners reveal frequently in their L2 learning (Anderson, Reynolds, Schallert, & Goetz, 1977; Tsui & Fullilove, 1998). Other studies suggested that less-proficient learners should place more weight on improving bottom-up skills for thorough understanding prior to integrating them with their background knowledge (Lee & Schallert, 1997; Tyler & Warren, 1987). Accordingly, a more balanced view between BU and TD processing is necessary for successful outcomes because mental processing is so complex that it involves both processing (Carrell, 1988; Mendelsohn, 2001; Sun, 2002).

With reference to the BU/TD processing approaches in vocabulary learning, there has been lack of studies to confirm the effectiveness of the approaches in EFL context. In recent years, Moskovsky et al. (2015) conducted a study on the relative effectiveness of the two processing strategies in English academic vocabulary teaching with 120 Chinese university students, whose English proficiency level is relatively low. They reported that the scores of the BU group were slightly higher than the TD group's, indicating that the BU processing approach was more effective for less-skillful EFL learners' vocabulary learning, based on two factors of proficiency level and nature of L2 lexical development (Eskey, 1988; Shohamy & Inbar, 1991). In addition, they found that the process of acquiring new vocabulary, by its nature, seemed to be well aligned with the BU processing approach, reporting the learners' strong preference for BU to TD. It was also argued that Chinese sociocultural and educational contexts deeply based on the bottom-up sequence might have had an influence on the learners' preference for the BU approach (Jin, 2010).

2.3. Research on Vocabulary Teaching and Learning in the Korean Setting

Regarding research on vocabulary teaching and learning performed in the Korean setting, Chin (2002) investigated the effectiveness of context and semantic mapping treatments comparing to the traditional method—a word-list treatment. She found that students' outcome in the context treatment group was better than that of the word-list treatment group. It can be interpreted that it is necessary to provide EFL learners with a variety of contexts when they learn new words. In other words, "contextualization" appears to help enhance learners' retention of vocabulary (Schouten-van Parreren, 1989).

In Kwon's (2004) study on how to present new words to learners in EFL classrooms, she measured the differences across the four different treatment groups (examples before English definition; examples before Korean definition; Korean definition before examples; and English definition before examples) depending on vocabulary presentation. She found

that while there were no significant differences across the vocabulary treatments, the order to present new words had a positive effect on their performance, reporting that the example-first groups did better than the definition-first ones. That is, learners tend to take in new words better when they are cognitively engaged. She finally proposed that a teacher needs to consider learners' processing strategies when presenting new words in vocabulary instruction and help them cognitively engage in the meaning of the target words.

The importance of processing strategy use in vocabulary learning was reaffirmed by Pae's (2016) research, in which learners' vocabulary achievement was significantly related to strategy use, such as the depth of processing and determination strategies. He argued that the training of vocabulary learning strategy should be implemented in EFL contexts to increase EFL learners' vocabulary knowledge. The issue these studies suggest in common is the necessity of vocabulary learning using the order and depth of processing such as BU and TD processing approaches.

As mentioned above, due to lack of research conducted on vocabulary learning using the BU and TD approaches, any pedagogical and pragmatic consideration regarding the use of the approaches in vocabulary instruction are not presented yet. In this respect, the current study aims at investigating the effectiveness of the BU/TD processing approaches in EFL students' vocabulary learning in general and depending on their level of vocabulary knowledge, and their overall perception of the two approaches.

3. RESEARCH DESIGN

3.1. Participants

The participants taking part in the current study was 127 college students, who enrolled in *General English* for freshmen or *English Writing* for sophomores as a compulsory course during the fall semester in 2017 at a university. They were from seven classes: six *General English* classes consisting of 16, 13, 21, 18, 20, and 15 students for each and one *English Writing* class of 24 students. Five of them were excluded for the analyses due to their absence resulting from sick leaves or private matters. The total number of 122 students with 107 male students (87.7%) and 15 female (12.3%) participated in the study. According to a pre-survey conducted to gather their background information for the present study, 14% of them had experiences of studying in English-speaking countries or English-mediated schools from 6 months up to 5 years and a half. In addition, they responded to a survey item to ask the previous vocabulary learning methods they had used. It revealed that most of them (89.3%) had heavily depended on learning new words by rote—memorizing Korean meaning of the target English words.

All of the participants from the seven classes were randomly assigned into two groups, taking into account the number of subjects, for the purpose of the analyses of group differences depending upon the two vocabulary learning approaches: one group for the bottom-up approach (BU: $n = 53$) and the other for the top-down approach (TD: $n = 69$). The two groups were homogeneous according to the two kinds of pre-tests administered before the treatment ($t = .368$, $p = .713$ for the AVST and $t = .745$, $p = .458$ for the CKPT). They were also divided into two levels in each approach group depending upon their L2 proficiency measured by their TOEIC scores: for the bottom-up approach group (average score: 797.06), 27 high-level students (50.94%) who scored above 810 with an average of 884.63, and 26 low-level students (49.06%) who scored less than 805 with an average of 706.12; and for the top-down approach group (average score: 793.26), 36 high-level students (52.17%) who scored above 810 with an average of 888.19, and 33 low-level students (47.83%) who scored less than 805 with an average of 689.70.

3.2. Instruments

3.2.1. Vocabulary tests

The two different kinds of vocabulary tests—the Academic Vocabulary Size Test (AVST) and the Controlled Productive Knowledge Test (CPKT) mainly based on Coxhead's (2006) and Nation's (2013) vocabulary studies—were administered to assess the participants' lexical competence in terms of comprehension (AVST) and production (CPKT). A number of researchers have verified validity and reliability of the two tests through their empirical studies (Laufer & Nation, 1999; Moskovsky et al., 2015; Nation, 2013; Schmidt, Schmitt, & Clapham, 2001). After some modification of Moskovsky et al.'s (2015) test formats for the purpose of the current study, the two tests were conducted both at the beginning as a pre-test and at the end of the semester as a post-test.

As for the AVST, a list of 30 words were randomly selected from Coxhead's Academic Word List (AWL). The students were asked to provide Korean translation of the words followed by checking out whether the meaning of the words is recognized (√), familiar (?), or unknown (X). The score of 1 was given in case that the translation of L1 was correct and that simultaneously a test taker marked √. An item with the mark (√) but involving the incorrect L1 translation was given 0.5 point, while the item with the familiar mark (?) and the correct L1 definition was received 0.5. However, if the familiar mark (?) came with a wrong L1 definition, a score of 0 was given. Lastly, as for the other mark, unknown (X), no score was given (0). The maximum score was 30. For the CPKT, 20 sentences involving one target word were randomly selected from Nation's (2013) Productive Level Test. The participants were advised to fill out the blanks in which the first two or three letters were

provided. A score of 1 was given to the correct answer for each sentence, and the maximum score was 20. The two tests were performed before and after the treatment respectively to ascertain any differences between pre- and post-test results.

3.2.2. Questionnaire

A pre-survey questionnaire was conducted at the beginning of the semester in order to obtain the participants' background information. The post-survey was carried out at the end of the course to attain their perception of the BU/TD approaches for vocabulary learning. They were asked of the following open-ended questions in the survey: What was the most important skill to improve their English proficiency?; which way or strategies did they use for vocabulary learning?; which one was more effective for vocabulary learning, the methods they had used or either of the BU or TD approach?; and what were advantages and disadvantages of the BU/TD approaches they experienced during the course? Multiple responses were allowed to the last question.

3.3. Procedures

First, all of the participants took the pre-tests to prove the equivalence of the two groups (BU and TD) on the first day of the course, using two different vocabulary tests: the AVST and the CPKT. The next week, they were informed of the BU/TD approaches, the procedure of the approach the participants in each group have to use, and how it is different from the traditional method of vocabulary learning—that is, rote memorization of the L1 translation of the target English words. With detailed information of the two approaches, they took a short practical training session, too. After the session, the participants in each group were engaged in a full-scale vocabulary learning session every week during the following four weeks. The vocabulary learning session was based on the six stages—from word formation, to definition and related words, to family words, to phrases and collocations, to sentences, and finally to context for the bottom-up approach group; and from context all the way down to word formation for the top-down approach group. In doing so, they were encouraged to look up related information from a number of online sources, the addresses of which were provided with the target words on the worksheets.

To put the stages in detail, at the word formation stage, the students were guided to look for the word parts (morphemic structures), pronunciation, and the meaning of the parts of the target words on the informed websites. At the definition and related words stage, they were asked to look up the definition and L1 translation of the target words as well as related English words. Thirdly, the stage of family words was aimed to have the students find the lexical family of the target words, such as derivations and inflections. Next stage is

to check up phrases and collocations of the target words. At the sentences stage, they focused on understanding of the target words in the sentence level. Lastly, at the context stage, they were exposed to a context involving the target words, which was provided for understanding meaning and usage of the target words in context.

Looking up detailed information of the target words, writing down the information on the assigned sheets, and reading them while engaged in these structured processes, they were encouraged to acquire the knowledge of the target words. The students in the BU group were provided with BU worksheets which consist of six stages from the word formation stage all the way up to the context stage, while those in the TD group received TD worksheets starting from the context stage all the way down to the word formation stage (Moskovsky et al., 2015).

Based on the self-directed learning model, the students in each group had five vocabulary learning sessions, including one session for the training practice, during the semester. They were guided to learn three target words for thirty minutes for each session, resulting in a total of 15 target words. The vocabulary learning sessions were included as a warm-up activity at the beginning of the class. Soon after they completed vocabulary learning, they were expected to check and review their work based on the answers uploaded by the instructor on the online bulletin board. At the end of the semester, the post-tests were administered to measure the participants' progress according to the two different vocabulary learning approaches.

3.4. Data Analysis

The test results were analyzed using the SPSS statistical package, version 24.0. First, the scores in each vocabulary test were recalculated to be the total of 60 because the total scores of the two vocabulary tests were different: 30 for the AVST and 20 for the CPKT respectively. Next, descriptive statistics were calculated, and then *t*-tests were performed to check for any statistical differences in accordance with the variables of pre-/post-tests, approach groups, and L2 proficiency levels. Finally, numerical calculation was conducted to examine the participants' perception of the two vocabulary learning approaches.

4. RESULTS AND DISCUSSION

4.1. Students' Vocabulary Knowledge According to the Two Approaches

First, the students performed remarkably better in the test measuring their receptive (comprehensive) vocabulary knowledge than in the test measuring their productive

vocabulary knowledge, as in Table 1. It may well be a fact that the number of words students can comprehend is reasonably larger than the number they can use in speaking and writing (Read, 2000).

TABLE 1

Differences of the Two Different Tests in the BU and TD Approaches

Test	Bottom-Up Approach ($N = 53$)			Top-Down Approach ($N = 69$)		
	M(SD)	t	p	M(SD)	t	p
AVST pre	35.85(7.080)	12.248	.000	36.41(9.614)	18.080	.000
CPKT pre	17.83(9.008)			16.65(8.384)		
AVST post	38.83(6.977)	15.414	.000	39.04(7.982)	16.240	.000
CPKT post	21.85(8.160)			21.43(9.847)		

Next, *t*-tests were performed to examine the improvement of the participants' vocabulary knowledge between pre- and post-tests of the two kinds of tests. As in Table 2, significant mean differences were found between the pre- and post-test scores of the two different tests. It signifies that after the vocabulary learning treatment using either the bottom-up or top-down approach for one semester, the students made significant gains in the post-test than in the pre-test, experiencing a remarkable growth, regardless of the instruction type they were engaged in (Moskovsky et al., 2015). That is to say, the two vocabulary learning approaches had a considerable effect on the improvement of the students' acquisition of both comprehensive and productive vocabulary knowledge measured by the two tests.

TABLE 2

Differences of the Pre- and Post-tests in the BU and TD Approaches

Test	Bottom-Up Approach ($N = 53$)			Top-Down Approach ($N = 69$)		
	M(SD)	t	p	M(SD)	t	p
AVST pre	35.85(7.080)	-3.768	.000	36.41(9.614)	-3.637	.001
AVST post	38.83(6.977)			39.04(7.982)		
CPKT pre	17.83(9.008)	-3.884	.000	16.65(8.384)	-6.319	.000
CPKT post	21.85(8.160)			21.43(9.847)		

Now, *t*-tests were administered based on the mean scores of the post-tests of the AVST and the CPKT in order to find any differences of the students' vocabulary knowledge in accordance with the two processing approaches (BU and TD). As seen in Table 3, there was no statistically significant differences between the BU and TD approaches in the two types of the tests. The outcome reveals that the two approaches—BU and TD—equally effective to the students' acquisition of receptive and productive vocabulary knowledge after the formal instruction in the current EFL context as shown in Table 2. Yet Moskovsky

et al. (2015) reported different results that the bottom-up group outperformed the top-down group on the AVST, indicating a close, reciprocal connection between bottom-up processing and language perception (Celce-Murcia & Olshtain, 2001; De Bot et al., 1997; Levelt et al., 1999).

TABLE 3
Differences of the Participants' Vocabulary Knowledge According to the Two Approaches

Test	Group	N	M(SD)	t	p
AVST	BU	53	38.83(6.977)	-.154	.878
	TD	69	39.04(7.982)		
CKPT	BU	53	21.85(8.160)	.248	.805
	TD	69	21.43(9.847)		

4.2. Students' Vocabulary Knowledge According to the Two Approaches Depending upon Their L2 Proficiency Level

Now the data were analyzed to examine any differences of the students' vocabulary knowledge in the two vocabulary learning approach groups depending upon their L2 proficiency level. In order to investigate the high-level students' data, *t*-tests were conducted based on the mean scores of the post-tests of the AVST and the CPKT. As in Table 4, there were not any significant differences between the two approach groups in both types of tests, although the scores of the TD group slightly higher than the BU group's. It corroborated the previous results in Tables 2 and 3 that the high-level students developed their receptive and productive vocabulary knowledge during the treatment period no matter which approach they were exposed to.

TABLE 4
Differences of Vocabulary Knowledge of Students in High Level Between the Two Approaches

Test	Group	N	M(SD)	t	p
AVST	BU	27	39.93(7.795)	-.476	.636
	TD	36	40.89(8.049)		
CPKT	BU	27	24.89(9.517)	-.779	.439
	TD	36	26.75(9.278)		

The same procedure using *t*-test was also applied to the students in low L2 proficiency level to measure the effect of the two approaches on the two types of the tests. As in Table 5, for the AVST, no statistically significant differences were found between the two approach groups; however, in the CPKT, the performance of the two approach groups differed significantly. That is, the low-level students showed significant differences depending upon the vocabulary learning approach in the test measuring their productive

knowledge of vocabulary (CPKT), but not in the test measuring their receptive knowledge (AVST). This can be translated that the BU approach is more appropriate for the growth of productive vocabulary knowledge of the students in low L2 proficiency level than is the TD approach (Eskey, 1988; Shohamy & Inbar, 1991).

It is highly noteworthy that the BU approach plays a greater role in vocabulary learning in the production mode (i.e. CPKT) than in the perception mode (i.e. AVST) for those in low L2 proficiency level, unlike the age-old belief that BU processing has things to do with language perception, whereas TD processing with language production (Celce-Murcia & Olshtain, 2001; De Bot et al., 1997; Levelt et al., 1999; Moskovsky et al., 2015). This is an outcome attesting the fact that the BU approach does not exclusively work in language perception and neither does the TD approach only language production (Levelt et al., 1999).

TABLE 5
Differences of Vocabulary Knowledge of Students in Low Level Between the Two Approaches

Test	Group	N	M(SD)	t	p
AVST	BU	26	37.69(5.952)	.367	.715
	TD	33	37.03(7.519)		
CPKT	BU	26	18.69(4.897)	2.016	.049
	TD	33	15.64(6.740)		

4.3. Students' Perception of the Two Vocabulary Learning Approaches

4.3.1. Students' preference for the vocabulary learning approach

The post-survey was conducted to investigate the participants' overall perception of the two vocabulary learning approaches—BU and TD—at the end of the treatment. According to the survey, 109 participants (89.3%) responded that they placed heavy reliance on learning vocabulary by memorizing L1 meaning of the target English words. Some of them added that they used the rote memorizing technique along with others such as lexical learning in sentences or contexts (42.6%), memorizing English meaning of the target words (38.5%), or practicing pronunciation of the words (26.2%), and so on. This verifies the view that vocabulary learning has been largely conducted on a word-by-word basis in EFL settings (Chin, 2002; Crow & Quigley, 1985; McKeown, 1993; Nist & Olejnik, 1995).

Notably, however, there was a change in the participants' perspective of their vocabulary learning methods after the treatment using the BU or TD approach. Out of 122, 73 students (59.8%) ascertained that the BU or TD approach they were exposed to was a more effective way than rote learning to increase their vocabulary knowledge, adding that

the approach helped them store the words in their long-term memory as well as deepen their vocabulary knowledge in a systematic way (Schouten-van Parreren, 1989). On the other hand, the rest (40.1%) still preferred the rote learning strategy probably because the technique was quite familiar and had been used until they encountered the approach, and because they lacked a sound systematic approach to vocabulary learning until then (Ma, 2009; Moskovsky et al., 2015). They also pointed that it took too much time to acquire one word due to the complicated process of the approach.

4.3.2. Advantages of the BU/TD approach

The most frequently mentioned advantage of the BU/TD vocabulary learning approaches was that the approach could help them better understand new words and store them effectively in the long-term memory as shown in Table 6. This response seemed to be strongly related to the second ranked advantage that they could expand the depth of vocabulary knowledge thanks to the systematic aspect of the approach. In other words, the six-stepped process of the BU/TD approach is for sure to make the participants meet new words repetitively, developing knowledge about the word and finally resulting in reinforcing their memory of the word (Hedge, 2000; Kachru, 1962; Lewis, 2002).

TABLE 6
Advantages of the BU/TD Vocabulary Learning Approach

Rank	Benefits	Number (%)
1	Help memorize words and store them in the long-term memory	35 (28.6)
2	Expand the depth of vocabulary knowledge	33 (27.0)
3	Learn related words	20 (16.3)
4	Know the origin of words	13 (0.10)
5	Understand word formation and usage	12 (0.09)
6	Raise interest in vocabulary learning	10 (0.08)
7	Improve ability to utilize words in a sentence	7 (0.05)
8	Learn different meanings of a word	4 (0.03)
9	Improve reading ability	2 (0.01)
10	Guess the meaning of the words from word origin or context	1 (0.01)

They also articulated that the process of the BU/TD approach helped them acquire the origin of words, related words, word formation and usage, and even roles of the words in sentences. Furthermore, they reported that the approach was very effective to enhance not only reading ability but also vocabulary learning. Plus, the autonomous process of vocabulary learning to search for detailed information of a word through a number of online sources may well contribute to raising their interest in vocabulary learning as well, bringing about positive effect on it.

Setting these benefits aside, a meaningful minority opinion was that they were able to guess the meaning of the target words based on the origin of the words or reading contexts around the words. It is very well instructive that the students learned how to use context to guess the meaning of words while trained using the BU/TD approach, which is a highly recommended strategy to build up vocabulary knowledge as well as improve reading proficiency (Clark & Nation, 1980; Nation, 2013; Summers, 1996; Zimmerman, 1997).

4.3.3. Disadvantages of the BU/TD approach

Table 7 presents the disadvantages of the vocabulary learning approach reported by the participants. Above all, the most considerable doubt about the BU/TD approach they voiced was that it took too much time to learn a word, which led them to think the approach was ineffective and uneconomical. The concern about the approach next in rank was closely related to the first one. They confessed that the number of words they could learn and memorize was quite limited because of the lengthy process required in the approach to learn a target word. Plus, they felt worried that the complicated, lengthy process caused them to have too much work in learning vocabulary.

TABLE 7
Disadvantages of the BU/TD Vocabulary Learning Approach

Rank	Drawbacks	Number (%)
1	Taking too much time	64 (52.4)
2	Limited number of words to learn	21 (17.2)
3	Too much work to do	10 (0.08)
4	Complicated process	10 (0.08)
5	Troublesome to follow the steps	7 (0.05)
6	Uncomfortable situation to use online sites	7 (0.05)
7	Unnecessary information (word formation and phonetic symbols)	5 (0.04)
8	Unsure of using the vocabulary knowledge	4 (0.03)
9	Discouraging self-directed learning	4 (0.03)
10	Lack of repetition of the words to be remembered	2 (0.01)

Another negative aspect of the approach they pointed out was inconvenience they faced while using online sources. For example, because the number of online sites they could use was limited, it was hard to look up target words in online dictionaries, or technical problems of the Internet were frequently occurred. They also raised doubts about the effectiveness of the information they had found about word formation and phonetic symbols of the target words. A few criticized the information even as "trivial" (Stæhr, 2009). The respondents might think that understanding of phonemic difference and word formation was unnecessary probably because they didn't recognize that understanding of the features is conducive to learning the target words.

Besides, there were some minor voices about the drawbacks of the approach. They thought it discouraged self-directed learning because of its complicated process that need students' active participation. A few added that they easily forgot the words they had learned since the process was not on the simply repetitive basis which they learned vocabulary until then. The complaint appears to be associated with their unfamiliarity with the BU/TD vocabulary learning approach (Kwon, 2004; Moskovsky et al. 2015).

5. CONCLUSION

In this study, 122 college students were trained using either of the two processing approaches—bottom-up and top-down—for one semester in order to investigate the effectiveness of the two processing approaches on EFL learners' vocabulary learning, the difference in the effects of the two approaches depending upon the learners' L2 proficiency level, and their overall perception of the approaches. There are several things indicative from this research.

Both groups made significant gains in the attainment of English vocabulary knowledge in terms of receptive and productive vocabulary. This signifies that either of the two approaches adopted in the current study was quite effective in achieving substantial learning outcomes (Moskovsky et al., 2015). In addition, the approaches also enhance the value of explicit and direct vocabulary learning for the development of both receptive and productive vocabulary knowledge (Brown, 2007; Read, 2004).

There have been instruction-group differences in the outcomes according to the students' L2 proficiency level. For high-level students, no significant differences between the two groups were found in the two tests results. For low-level students, however, the bottom-up group outperformed the top-down group on one of the vocabulary knowledge tests (CPKT) (see Table 5). This reveals two disparate implications. The current study partly supports the general agreement made in previous studies that highly proficient learners tend to favor top-down processing, while bottom-up processing is more common among low-proficiency learners (Eskey, 1988; Moskovsky et al., 2015; Shohamy & Inbar, 1991; Tsui & Fullilove, 1998). Another implication is that the study failed to reinforce the belief that language perception is mainly related to bottom-up while language production to top-down (De Bot et al., 1997; Levelt et al., 1999; Moskovsky et al., 2015). Given that a different outcome was yielded in the current study performed in the Korean EFL setting comparing Moskovsky et al.'s (2015) study conducted in the Chinese EFL context, more research that considers specific factors such as cultural difference and tradition in each EFL context is invited to obtain a better understanding of the issue in question.

Lastly, based on the survey results, nine out of ten participants had relied heavily upon

learning vocabulary on a word-by-word basis. Luckily, however, a change was noticed in their perspective of vocabulary learning methods after the treatment using the BU/TD approach. More than half of them admitted that the approach they were exposed to was more systematic and effective than rote learning to enhance their vocabulary knowledge, in terms of effectiveness of storing the words in long-term memory, expanding the depth of vocabulary knowledge, reinforcing memory of words, raising interest in vocabulary learning, to name a few (Hedge, 2000; Kachru, 1962; Lewis, 2002). On the other hand, about 40% still expressed a strong preference for the traditional way mostly because of the time constraint, limited number of words to learn, too much work to do, and complicated process of the approaches. Accordingly, when implementing the two approaches in their classes, teachers are required to take into consideration how to deal with the drawbacks voiced by quite a number of students in order to beef up the effectiveness of the approaches and ultimately help learners build up comprehensive, practical vocabulary knowledge.

The present study was designed to examine the applicability and effectiveness of the two well-established processing approaches—bottom-up and top-down—in vocabulary instruction in an EFL setting, sort of uncharted territory in L2 learning. Therefore, further studies need to be performed to bridge the gap unsettled in the current study, such as the issues of comparative effectiveness of the two processing approaches in vocabulary learning, the relationship between the effectiveness of the approaches and learners' L2 proficiency level, and practical solutions to consolidate the advantages of the approaches, minimizing their drawbacks.

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Applicable levels: Tertiary

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