How Do Korean College Students Perform in Two Different Vocabulary Assessments?[*]

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This study investigated Korean college students' performance as measured by two different vocabulary assessment tools (the Productive Vocabulary Levels Test (PVLT) and the Productive Vocabulary Use Task (PVUT)) and the relationship these assessments have with students' writing proficiency. A total of 72 students participated in the study. The students were asked to take the PVLT and the PVUT and write an essay. They were also asked to write a reflection paper to assist in examining what kinds of processes they go through in vocabulary production for both tests. The results of the study indicated that the students' ability to produce vocabulary and the number of lexical errors displayed in the results of the two different assessment tools were highly contingent on the test format. The students produced more target words in the PVLT since they were helped by clues of a few given initial letters of the target items. On the other hand, the students produced more alternatives than target words when allowed to choose words freely in the PVUT. As for the relationship between the students' performance on the assessment tests and their writing proficiency, the results of the study showed that the students with a higher proficiency produced a higher number of correct target items and left fewer words unanswered in both tests. This study explores the possibility of using an alternative assessment tool and suggests that careful interpretation of the results of the different tests should be associated with assessment purposes.

Key words: productive vocabulary knowledge, writing proficiency, lexical errors

1. INTRODUCTION

It is generally accepted that the role of vocabulary in L2 learning and teaching is crucial in the English as a Foreign Language (EFL) context as it contributes significantly to the

development of L2 learning and effective communication. In order to convey and share ideas and information successfully, proper use of vocabulary is integral. In addition, the effective use of specific vocabulary could also be said to be important for writing as a means of communication in academic settings as it helps learners to fulfill their academic literacy needs (Scarcella & Zimmerman, 1998). In this regard, it can be determined that vocabulary knowledge serves as a crucial indicator of the writing quality expected of a member of an academic discourse community and moreover that of successful communication in a global community.

Due to the importance of the role of vocabulary involving L2 learning and successful communication, many researchers and teachers have sought an effective means of measuring learners' productive vocabulary knowledge. Among the various productive vocabulary assessment tools, perhaps one of the mostly widely used tests is the Productive Vocabulary Levels Test (PVLT) (Laufer & Nation, 1999). This measuring tool helps identify learners' vocabulary knowledge in terms of size at five different word frequency levels (the most frequent 2nd [K2], the 3rd 1000 [K3], the 5th 1000 [K5], the University Word Level [UWL], and the 10th 1000 [K10]). The PVLT asks test-takers to produce only predetermined target words in a sentence (18 sentences at each word frequency level), with a few letters of each target word provided. The results of the PVLT indicate the extent of productive vocabulary knowledge that is able to be produced at each level (Laufer & Nation, 1999). In this regard, such information is useful for teachers as they can identify the stages where learners stand and focus on a certain word frequency level to improve students' vocabulary depending on the purpose for vocabulary teaching and assessment.

Although the PVLT may be easy to administer and interpret (Laufer & Nation, 1995, 1999), it arguably has some limitations in that it only shows learners' ability to connect meaning and form prompted by a few letters of the target words in a sentence context. Some research suggests that the PVLT may, in fact, test receptive knowledge since the target word presented with some clues is sufficient for students to recognize a word (Melka, 1997). Moreover, since the PVLT does not allow test takers to choose the vocabulary they want to use, it is questionable whether or not the test scores at each level indicate the size of vocabulary learners actually produce in their writing. Therefore, in order to interpret the results of the test scores more effectively and take the appropriate actions to improve learners' vocabulary knowledge, identifying learners' actual vocabulary choices and types of lexical errors is necessary.

With the limitations of the PVLT relating to measuring productive vocabulary knowledge, there is a clear need for an alternative measure of productive vocabulary knowledge. It is reasonably suggested that a test should be designed to measure test-takers' actual vocabulary embedded in writing. When writing a composition, it is more likely that test-takers will make word choices according to context from their own productive vocabulary. The most

beneficial part of this writing-induced method is that it can provide useful information regarding what types of lexical errors learners make or what types of alternative words learners provide instead of the target words. It is strongly believed that lexical mistakes cause distorted communication and thus have a negative effect on the quality rating of learners' writing. Nonetheless, there is an apparent lack of attention to lexical mistakes and the main source of those mistakes (Meara, 1984). Therefore, identifying learners' ineffective use of vocabulary is a necessary step in taking the appropriate actions to improve learners' vocabulary knowledge.

Accordingly, this study explores a possible alternative assessment tool, named the Productive Vocabulary Use Task (PVUT). This writing-induced test may provide useful information on the extent of vocabulary knowledge, particularly when discussed with its ability to measure vocabulary knowledge in a different way than the PVLT. In order to do so, this study identifies the differences in learners' productive vocabulary and their lexical errors displayed in two different assessment tools: the PVLT and the PVUT. It is easily assumed that test-takers do not fill in the blanks in the PVLT when they do not know answers. However, rather than only counting the number of correct or incorrect answers, it is important to focus not only on the process of how they produce the correct answers, but also on the reasons why they are unable to provide answers for some questions. At the same time, vocabulary errors made in the PVUT can potentially be interpreted in a more inclusive way since they are embedded in actual writing contexts. Such interpretation may help identify and assess learners' weaknesses in learning and producing vocabulary. Moreover, it is also necessary to identify the relationship between students' performance in the PVLT and the PVUT and their writing proficiency. The following research questions were set in order to fulfill the purpose of this study.

1. How do Korean college students choose vocabulary and what types of lexical errors do they make in the PVLT?
2. How do Korean college students choose vocabulary and what types of lexical errors do they make in the PVUT?
3. What is the relationship between students' performance in the PVLT and the PVUT and their writing proficiency?

2. LITERATURE REVIEW

2.1. Approaches to Vocabulary Assessment

Defining what it means to know a word has been a difficult task that has been dealt

with by many researchers (Chapelle, 1994, Nation, 1990; Richards, 1976). It has often been defined as the sum of individual parts of knowledge, such as word form, morphology, grammar, collocations, synonyms, antonyms, and social constraints for the use of a word (Nation, 1990; Richards, 1976). Alternatively, vocabulary knowledge has been viewed as a continuum comprising several levels of knowledge from simple familiarity with the word to the ability to use the word in free production (Faerch, Haastrup, & Phillipson, 1984; Palmberg, 1987). In this regard, it is reasonably presumed that the methods for testing vocabulary are closely connected with how vocabulary knowledge is defined and how assessment purposes are identified.

In the field of vocabulary assessment, the distinction between breadth (size) and depth of vocabulary knowledge has primarily been used. Breadth refers to the number of words learners know (Anderson & Freebody, 1981). In order to measure the learners' size of vocabulary, typically one component of vocabulary knowledge is assessed. By administering a large quantity of test items, these assessments claim to indicate the learners' total vocabulary knowledge (Laufer & Goldstein, 2004). In the field of productive vocabulary assessment, perhaps one of the most widely used tests is the Productive Vocabulary Levels Test (PVLT), which assesses the size of vocabulary that can be produced at five different word frequency levels (K2, K3, K5, UWL, and K10). Although this test claims to be useful in that it shows learners' total size of vocabulary, it is implausible to extrapolate the size from a small number of test items (18 test items at each word frequency band). Moreover, test-takers' vocabulary knowledge in response to stimuli of a few initial letters of the target words cannot be considered the same as the ability to produce words in writing (Lee & Muncie, 2006).

On the other hand, depth refers to how well learners know a word. For example, the Vocabulary Knowledge Scale (VKS) developed by Wesche and Paribakht (1996) assesses learners' various levels of word knowledge about a target item in terms of synonyms, L1 translation, and sentence use. However, the VKS as a self-report test format has some limitations in assessing the depth of learners' productive vocabulary knowledge since test-takers "often produce a semantically neutral context for the word which gives little indication of its specific meaning" (Read, 2000, p. 137). Another example of productive vocabulary assessment is the Lexical Frequency Profile (LFP) designed by Laufer and Nation (1995). This measure shows learners' vocabulary knowledge through their writing according to word family and a proportion of vocabulary at each word frequency level (the 1000, the 2000, the Academic Word List, and "not in the list" word levels). By showing the final ratio of the words that appeared in learners' writing according to their frequency, this measure helps identify the stages where learners stand in terms of vocabulary development (Laufer & Nation, 1999). Despite the number of positive features, the LFP has some limitations. Muncie (2002)

points out the complex ways necessary for calculating the percentages since the proportion of vocabulary at a certain word frequency level varies depending on any increase and decrease in the number of vocabulary at other frequency bands.

With all the limitations of the productive vocabulary measures indicated above, there seems to be a need for an alternative measure for productive vocabulary knowledge. Such a measure should be designed to assess test-takers' actual vocabulary embedded in writing, and identify their strengths and weaknesses in vocabulary production to provide practical guidance for improving their writing quality. In other words, vocabulary produced by learners should be regarded in a broader scope, for example, in terms of alternative choices, mistakes, and strategies learners use to solve vocabulary problems while writing. This view is in line with Bachman and Palmer's (1996) task-based language test. They argue that language testing should not only determine learners' language knowledge such as grammar and spelling, but also assess their strategic competence. In order to do so, learners' vocabulary should be tested in a context where they are able to activate their vocabulary freely in communication. Therefore, this study explores an alternative approach to assessing learners' productive vocabulary knowledge through writing, the PVUT. By this approach, learners' actual vocabulary and their lexical errors can be investigated in a more inclusive way. This study also identifies learners' productive vocabulary as measured by another assessment method, the PVLT, and compares the results of it with those of the PVUT. This attempt is to provide practical implications for how to use the two different assessment tools (meaning-form connection and translation) in more effective ways.

3. METHOD

3.1. Participants

For this study, 90 Korean college students participated. They undertook a three-credit elective English composition course that met twice a week for 75 minutes each time. However, this number decreased to 72 since 18 of the students failed to complete all the tasks given in class and were thus excluded from the data set. In terms of their English proficiency, while 29 participants (40.28%) had no official test scores, forty three participants (59.72%) presented official test scores. Their TOEIC scores ranged from 400 to 970. The students were mostly juniors and seniors and came from various fields of study: forty one (56.94%) came from engineering and the remaining 31 students (43.06%) studied law, humanities, administration, and mathematics.

All the participants in this study had never previously taken any English writing courses. As per the PVLT, no participants had experienced taking the test. The participants also

reported that they had no experience translating Korean into English without an English equivalent provided.

3.2. Instrument

In order to identify how the participants perform in two different assessment methods, the PVLT and the PVUT were administered. The PVLT, which is available at http://www.lextutor.ca, was adopted in paper-and-pencil format so participants would be unable to explore any vocabulary which was to be used for later tests at other word frequency levels and for the PVUT. The PVLT consists of five word frequency levels containing 18 sentences each with differing numbers of initial letters of the target word items at each word frequency level. However, this study adopted only the first four levels (K2, K3, K5, and UWL) excluding the 10,000 word frequency level. This was because the scores on the 10,000 band revealed through the pilot study were so low as to create a statistical floor effect. Collectively, 72 word items (4 bands x 18 word items) were adopted in this study. The participants were given the test of 36 items twice, two word frequency bands at a time, and spent approximately 30 minutes to complete each test on average. During the test, the participants were not allowed to use any kind of dictionary or consult with their teachers or other participants.

In order to assess the students' productive vocabulary in a different context than the PVLT, the PVUT was devised. It is a translation task originally designed to compare the students' productive vocabulary with the results of the PVLT at the K2 and K3 bands only (Park, 2012). However, in order to examine a broader scope of students' productive vocabulary knowledge, the K5 and UWL bands were added in this study. Therefore, the same word frequency levels (the K2, K3, K5 and UWL) as those of the PVLT were adopted. In order to measure the students' productive vocabulary knowledge by inducing them to write, they were given a Korean text with matching pictures so as to allow for a better understanding of the text, and were asked to translate it into English. Each text at each word frequency band contained 13 to 15 target word items drawn from the different versions of the PVLT at the K2, K3, K5 and UWL bands. Compared to the PVLT, which has 18 test items at each band, the number of items was reduced by omitting items that were thought to be irrelevant to the context of the text. The reason why different versions of the target items were chosen was that it can reduce the possibility of participants benefitting by practicing words which they met when taking the PVLT. A sample test sentence of the PVUT at the K3 band is presented as follows:

그는 배가 너무 고파서 도둑이 되기로 결심하였다.
(Possible answer: He was so hungry that he decided to become a thief)

The participants were given 25 to 35 minutes on average to translate each text into English. They were not allowed to use any kind of dictionary or consult with other participants.

Finally, to determine if there is any relationship between the participants' performance in the PVLT, the PVUT, and their writing, a writing task was designed. The participants were given 30 minutes to write an argumentative essay on the topic of privacy. They were not allowed to use a dictionary or consult with their peers.

In order to better understand the students' performance and the thought processes they undertake when taking the PVLT and the PVUT, they were asked to write a reflection paper. This provides useful information of how students choose vocabulary and how they deal with problems encountered when producing vocabulary. When unclear remarks needed to be clarified in the reflection papers or when relevant additional questions arose, follow-up individual interviews were carried out and recorded with the students' consent. The interviews were of importance since they provided details with regards to how the students performed the task in relation to their habits and strategies in terms of vocabulary production.

3.3. Data Collection Procedure

The course the participants took was a three-credit elective English writing class. To eliminate any practice effect and minimize any potential benefits from taking the writing course, all data for this study was collected within the first six weeks of the semester; and, any instruction involving vocabulary and writing was not provided during the data collection period.

During the first week of the semester, a writing test and background questionnaire were performed. In the second and third classes, the students were asked to take the two PVLT tests with words taken from two word frequency bands, in addition to writing their reflection papers. They were also asked to complete the PVUT, two word frequency bands at a time, and submit a reflection paper in the fourth and fifth classes. Finally, in the sixth week of the class, individual interviews were conducted to clarify students' responses in the PVLT, the PVUT, and their reflection papers.

3.4. Data Analysis

The PVLT was scored based on the number of correct test word items. For

grammatically correct target answers, one point was given and zero points for incorrect words. Any spelling errors were counted as incorrect just as they were marked as incorrect on the website, http://www.lextutor.ca. The reason for applying the same standards as in the test on the website is because it is very difficult to establish a criterion on which to identify the boundary of acceptance in terms of spelling mistakes and errors. The scores on the PVLT at each word frequency band were converted into percentages in order to compare easily with the scores on the PVUT which had a different number of test word items.

The same criterion for the PVUT was applied for scoring the PVLT in order to maximize the scoring reliability when comparing the students' productive vocabulary knowledge in the two assessment methods. That is, one point was awarded for grammatically and semantically correct target words and zero points for incorrect and any misspelled words. More specifically, in case of a problem not directly caused by a lack of knowledge about the target word itself, for example, in a sentence produced by a participant, "*he receive his wage*," the target word "wage" was rated as correct. The error was attributed to a lack of knowledge of subject-verb agreement. The scores on the PVUT at each word frequency band were also expressed as percentages so as to allow for an easier comparison of the scores from the PVLT. However, the scores on the PVUT should be interpreted with a focus on whether the students actually produce the target words in a different testing context from the PLVT. This is because the scores on the PVUT do not necessarily indicate vocabulary size since it is possible that the students know target words but do not choose them in actual writing.

Note that the PVUT allows test-takers to choose their desired vocabulary when writing. In this regard, it is impossible to determine their productive vocabulary only by scores in terms of correct target words. Therefore, it is important to identify what type of vocabulary they actually produced rather than producing the target words. The scores for correct alternatives should be included and interpreted accordingly. The category "alternatives" indicates one of the subcategories of the components of vocabulary knowledge "association" suggested by Nation (2001), which means the ability to provide other words instead of the target one such as synonyms. The term "alternatives" in this study refers to any acceptable words that could be replaced with the target words according to context. When alternatives were accepted, they were categorized as "alternatives" and scored in the same way as for the PVLT and were also expressed as percentages.

In order to thoroughly analyze the participants' productive vocabulary in the PVLT and the PVUT, four categories for coding the target word items were adopted: correct words, incorrect words, unanswered words, and alternatives. Coding was conducted by the researcher and a native speaker of English. When areas of disagreement regarding

coding arose, a series of talks followed to discuss the discrepancies and reach an agreement. After a coding consensus was reached, all the test sentences including the target words were typed in a text file and coding was inserted by the researcher. The inter-rater reliability between the two coders was also analyzed using the Pearson correlation coefficient, and the results showed significant correlations ($r = .756$, $p = .000$). In order to organize and search the large amounts of data according to category, Wordsmith Tools were used, which is a software program allowing for instant search and sort according to specifications set by users.

The participants' essays were rated by two native speakers of English using the TOEFL writing score guide. This rubric seemed to be ideal considering the writing prompt given in this study was very similar to those in TOEFL. The participants' writing was scored on a 6-point holistic scale and they were classified into two English writing proficiency groups (higher- and lower-level groups) in order to investigate whether the PVLT and the PVUT can differentiate the students' writing proficiency. The inter-rater reliability was .884 ($p = .000$). For the data analysis, multivariate analysis of variance (MANOVA) was performed using SPSS version 18 to further examine whether the PVLT and the PVUT can be successful indicators of writing proficiency.

4. RESULTS AND DISCUSSION

4.1. Productive Vocabulary and Lexical Errors in the PVLT

It seems difficult to assess the students' productive vocabulary knowledge through the PVLT; if the students leave answer spaces blank, it does not necessarily mean that they do not know the meaning of the target items. It is quite possible that their failure may result from a misunderstanding of the surrounding words presented in the context of the sentence. Therefore, their ability to produce the target word could be hampered by contextual elements in the sentence that the students are unfamiliar with.

Owing to such problems of construct validity of the PVLT, this study focused on what vocabulary the students could produce for the target words, rather than what vocabulary they could not produce and consequently left unanswered. Table 1 shows a ranked list of target words answered correctly at all four word frequency levels. Note that the possible causes of errors made by the participants are based on their explanations through interviews and their reflection papers. All the definitions of words used in this study are obtained from Collins COBUILD Advanced Learner's English Dictionary.

TABLE 1
Ranked List of the Correct Target Words in the PVLT

Rank	Test Item	WFL	% Correct	Rank	Test Item	WFL	% Correct
1	Cream	K2	90.3	37	Acid	K3	19.4
2	Lovely	K2	86.1	38	Solitary	K5	19.4
3	Ignore	K5	81.9	39	Pupils	K2	18.1
4	Popular	K2	80.6	40	Nerves	K3	18.1
5	Dozen	K2	79.2	41	Attached	K3	16.7
6	Improve	K2	77.8	42	Trend	UWL	15.3
7	Section	UWL	63.9	43	Doctrine	UWL	15.3
8	Admire	K2	62.5	44	Eve	K5	15.3
9	Career	K3	61.1	45	Burst	K2	13.9
10	Tax	K3	59.7	46	Comprehend	K5	13.9
11	Clinic	UWL	56.9	47	Soothe	K5	13.9
12	Injured	K3	56.9	48	Rely	UWL	12.5
13	Treasure	K2	55.6	49	Text	UWL	12.5
14	Wealth	K2	55.6	50	Ledge	K5	12.5
15	Naked	K3	54.2	51	Intimacy	UWL	11.1
16	Opportunity	K2	52.8	52	Proclaimed	K3	11.1
17	Delivered	K2	51.4	53	Slender	K3	9.7
18	Evaluate	UWL	50.0	54	Entry	K5	9.7
19	Mature	K5	47.2	55	Counsel	K3	8.3
20	Stretched	K2	43.1	56	Vault	K5	8.3
21	Area	UWL	41.7	57	Yarn	K5	6.9
22	Inspect	UWL	38.9	58	Motive	UWL	5.6
23	Introduced	K2	37.5	59	Homogenous	UWL	5.6
24	Import	K3	37.5	60	Ballot	K5	5.6
25	Lack	K2	36.1	61	Disclosed	K5	5.6
26	Philosophy	UWL	30.6	62	Inherent	UWL	4.2
27	Stable	K3	29.2	63	Gown	K3	4.2
28	Adequate	K5	29.2	64	Perceived	K3	2.8
29	Accumulated	UWL	27.8	65	Attained	UWL	1.4
30	Slight	K2	27.8	66	Subsequent	UWL	1.4
31	Lawn	K3	26.4	67	Thrust	K3	1.4
32	Scare	K3	23.6	68	Reform	K3	0
33	Oath	K5	23.6	69	Mound	K5	0
34	Hen	K3	22.2	70	Cavalry	K5	0
35	Charm	K2	20.8	71	Shoved	K5	0
36	Saturated	UWL	19.4	72	Bellow	K5	0

Note. WFL indicates word frequency level.

Among the target words, the word "cream" at the K2 band was the most correctly answered item by 65 (90.3%) out of 72 students, followed by "lovely (86.1%)" and

"popular (80.6%)." It was expected that the students would have no difficulty producing the target word "cream" in the given sentence "*He takes cr___ and sugar in his coffee.*" Obviously, the item "cream" was closely associated with other surrounding words. Such a sentence which includes semantically clustered words is attributable to activating the students' word lists and thus facilitating them in producing the target word easily.

Unlike the relatively easy contextual clues the students could use, the following items illustrate a case when they failed to answer since they could not understand the surrounding words. The students produced "delicate" instead of the target word "delivered" for the sentence "*The telegram was deli___ two hours after it had been sent.*" According to the interview, the students struggled with this question because they were unaware of the meaning of "telegram" and thus had to fill in the blank with any words beginning with "deli." This resulted in them selecting the word "delicate" out of familiarity.

Another mistake involving the target word "delivered" was also seen. The students made errors in verb voice for test sentences that needed to be completed with a past participle verb form. Instead, they produced the base form of the verb, "deliver." An additional example that shows the students' misuse of verbs appeared in their responses to the test question requiring "introduced" as in "*Ann intro___ her boyfriend to her mother.*" This sentence requires the past tense form of the verb "introduce" to make sense in the given context. The results of the test, however, indicated that only 27 students (37.5%) produced the correct form of the verb.

Although the students successfully deduced what words to produce for the context in terms of meaning, they failed to convey the meaning of the word effectively by making errors related to verb form. Considering the fact that such errors tend to lead to miscommunication, more attention should be given to help students use verbs more effectively.

Considering that the K2 and K3 bands accounted for a large number of correct target items in the PVLT, it was relatively surprising to see the test item "ignore" ranked third (81.9%) even though it belongs to a lower frequency word band, the K5. This unexpectedly high score for the item "ignore" reflects the students' needs for certain words. Unlike other words at higher word frequency levels such as K2 and K3, there is a relatively small chance that the students would know this word incidentally. Judging from the interview, although it belongs to a relatively lower word frequency level, it is the usefulness of a word that matters and it is entirely students' decision whether to adopt and store it in their own list of vocabulary. It seems that they judged the word "ignore" to be worth remembering.

Although the degree of difficulty of vocabulary depends on the context and can be reduced by learners' judgment regarding the usefulness of a word, it is revealed that the students had greater difficulty producing words at the K5 band. As seen in Table 1, none of

the students provided correct target answers for the following four test items: "mound," "shoved," "cavalry," and "bellow." The corresponding test sentences are as follows:

The small hill was really a burial mou_____. (mound)
The angry crowd sho_____ the prisoner as he was leaving the court. (shoved)
The soldier was asked to choose between infantry and cav_____. (cavalry)
We could hear the sergeant bel_____ commands to the troops. (bellow)

While the two items "cavalry" and "bellow" had the highest number of unanswered blanks, the other two items, "mound" and "shoved," were filled with many other words such as "mountain" and "shout" or "shot," respectively. If the context of each test sentence is closely analyzed, the substitute words suggested by the students seem plausible. It is very likely that the students were unaware of the infrequently used words "mound" and "shoved." However, it is arguably surprising that none of the students identified the target item "reform" at the K3 band (see Table 1) in that it is considered as being relatively easier to produce than the words "mound" and "shoved." As many as 53 students (73.6%) proposed incorrect words such as "reference" for the test sentence "*To improve the country's economy, the government decided on economic ref_____.*"

In order to understand the students' intention better, follow-up interviews were conducted. The main reason why they provided many incorrect words rather than leaving the items blank, as in the case of the words "cavalry" and "bellow," was that a few letters automatically acted as a trigger for the production of the words, "mountain" and "shot." For the same reason, many students responded that they immediately thought of the word "reference" simply prompted by the first three letters "ref" without any other valid reason. The following excerpt is representative of the students' difficulties in choosing vocabulary due to the test format of the PVLT.

> *When I look at the blank starting with "ref" as in the sentence, "reference" is the only word I can think of. I tried to come up with other words starting with the same letter that could be fit in the sentence but I could not.*
> (Originally written in Korean and translated by the researcher)

Another reason for many incorrect words was likely a strong belief that the alternatives were suitable for the context. Indeed, the word "shot" seems to fit the context and the word "mountain" seemingly suits as well. It is more likely that students' Korean background affected their answers with Korean graves traditionally located on mountains. Moreover, their decision must have been confirmed both by the hints of the first few letters and by their mistaken belief that they had successfully understood the context words. They did,

however, lack further knowledge in terms of the accurate meaning of the words and correct use of grammar. The word "mound," not "mountain," collocates with the word "burial." Their chosen words "shot" and "shout" were grammatically incorrect since they would require the appropriate preposition, "at" in this context, to be followed by an object.

It is conceivable that such target words were some of the least correctly answered items since they are relatively infrequently seen or used when reading and writing. Interestingly, a relatively high percentage of students left the item for "gown" unanswered considering it is a frequently and commonly used loanword. It was believed by students that "gown" only referred to working clothes worn by doctors in hospitals; when it could also refer to a "nightgown" or "bathrobe." This misunderstanding of the word prevented the students from identifying "gown" as having the meaning of "a dress women wear on a formal occasion" and thus being a good fit for the sentence.

Moreover, another reason for their inability to produce the word "gown" was that they did not know what "the ball" meant in the given sentence. This implies that most students tend to connect only a single definition with each vocabulary word, in this case "the ball" is "a ball used in sports," thereby preventing them from expanding and deepening their vocabulary knowledge. Once again, it appears that the importance of acquiring a deep knowledge of vocabulary should be applied to both vocabulary reception and production. These errors highlight a lack of in-depth vocabulary knowledge resulting in their incorrect choices. Based on the interviews with the students, it was found that they focus heavily on deducing the meaning of words by simply interpreting and checking the surrounding context words with which the target words are used.

More importantly, this finding reveals the limitations of the PVLT to some degree in measuring learners' productive vocabulary knowledge. In other words, failure to comprehend the surrounding words other than the target word in a sentence may have a negative influence. Therefore, there appears to be a clear need for an alternative vocabulary assessment tool that excludes problem-causing situations where students' production of the target word could be hampered by an unfamiliar surrounding words and context.

4.2. Productive Vocabulary and Lexical Errors in the PVUT

In order to investigate the students' performance in the writing-induced assessment method, the vocabulary the students produced for the target words in the PVUT was examined. Table 2 indicates a ranked list of target words answered correctly at all four frequency levels.

TABLE 2
Ranked List of Correct Target Words in the PVUT

Rank	Test Item	WFL	%Correct	Rank	Test Item	WFL	%
1	Nurse	K2	86.1	30	Bruise	K5	12.5
2	Hungry	K2	70.8	31	Ox	K3	11.1
3	Brave	K2	68.1	32	Seal	K3	9.7
4	Justice	K2	59.7	33	Tip	K2	8.3
5	Apartment	K3	55.6	34	Vein	K3	8.3
6	Climb	K2	52.8	35	Mortgage	K5	8.3
7	Democracy	UWL	51.4	36	Phase	K5	8.3
8	Normal	K3	50	37	Lieutenant	K3	6.9
9	Hug	K5	50	38	Trim	K3	6.9
10	Research	UWL	47.2	39	Deed	K2	2.8
11	Connect	K2	45.8	40	Examine	K2	2.8
12	Mess	K5	41.7	41	Blend	K5	2.8
13	Copy	K2	40.3	42	Plead	K3	1.4
14	Crisis	UWL	40.3	43	Whirl	K3	1.4
15	Surround	K2	36.1	44	Sermon	K5	1.4
16	Participate	UWL	33.3	45	Ledge	K5	1.4
17	Intelligence	UWL	33.3	46	Anomaly	UWL	1.4
18	Gloomy	K5	26.4	47	Assess	UWL	1.4
19	Wander	K2	23.6	48	Sequence	UWL	1.4
20	Marble	K3	23.6	49	Vision	UWL	1.4
21	Compliment	K5	22.2	50	Prospect	K3	0
22	Limit	K2	20.8	51	Snap	K3	0
23	Wage	K2	18.1	52	Apparatus	K5	0
24	Chilly	K3	16.7	53	Contemplate	K5	0
25	Devise	K5	16.7	54	Wholesome	K5	0
26	Stool	K5	16.7	55	Ensure	UWL	0
27	Supreme	K3	15.3	56	Indicate	UWL	0
28	Draft	K3	15.3	57	Restore	UWL	0
29	Usual	K2	12.5	58	Subside	UWL	0

Note. WFL indicates word frequency level.

The word item with the highest number of correct answers (86.1%) in the PVUT was "nurse" at the K2 band. However, considering that this target word is relatively easy, it is difficult to understand why some students failed to produce it. In order to identify the reasons, individual interviews were performed. The students revealed the difficulties incorporating the word "nurse" into the phrase where the Korean translation equivalent was provided with a modifier as in "*the nurse who was copying the list*." Although they indicated their confidence in knowing the word "nurse," it was much more difficult for them to produce it with a modifier. For the same reasons, the word item "copy" resulted in a lower percentage of correct answers. The students were unable to produce the word "copy" when presented with a modifier.

Similar reasons and difficulties were also reported in the case of the word item "apartment" that occurred together with "balcony" in the Korean writing prompt. Since the students were unsure how to combine these two words, they failed to produce the whole phrase, which

resulted in a surprisingly lower percentage of correct answers considering that it is considered to be a frequently and commonly used loanword. This finding indicated that the students resorted to avoidance when having difficulties combining two words together.

This shows that the PVUT requires a more complex knowledge of vocabulary as it is directly involved with writing. The PVUT calls for expanded skills beyond meaning-form connection, such as structuring phrases, clauses, and sentences, considering grammatical rules as well as appropriateness of vocabulary according to context. However, In this regard, the PVUT might be of value as the results of the PVUT can be representative of the students' actual vocabulary knowledge in association with writing.

It should be noted that the percentage of correct answers in Table 2 represents only the target word items used for the purpose of comparing the target words displayed in the two different assessment methods. For this reason, special consideration should be given to the interpretation of the results. It is probable that the test-takers could produce alternatives instead of the target words. In other words, in the PVUT a lower percentage of correct target words does not necessarily reflect a low level of vocabulary knowledge.

In the PVUT, rather than leaving test items unanswered, the students did their best to supply alternatives pertaining to the Korean equivalents by retrieving relevant words from their own list of vocabulary. The focus on what types of words were replaced with what types of alternatives is more meaningful in this study. Table 3 shows a list of the target words replaced with the most common alternatives given in the PVUT. The top 10 items on the list were as follows:

TABLE 3

Ranked List of Target Words Replaced with Alternatives in the PVUT

Rank	Test Item	WFL	%TG	Test Context	Alternatives	%Al
1	Ox	K3	11.1	*ox* pulling a cart	cow, bull	83.3
2	Wholesome	K5	0	*wholesome* food	healthy, good for health	81.9
3	Ensure	UWL	0	*ensure* to turn off the light	must, please surely	68.1
	Phase	K5	8.3	enter a new *phase* of in his career	step, stage	68.1
5	Stool	K5	16.7	Sit on a piano *stool*	chair	66.7
	Apparatus	K5	0.0	a heating *apparatus*	system	66.7
7	Chilly	K3	16.7	on a *chilly* day	cold	65.3
8	Vision	UWL	1.4	my *vision* is good	eyesight	59.7
9	Indicate	UWL	0	the research *indicates*	shows	44.4
10	Gloomy	K5	26.4	feel *gloomy*	depressed	43.1

Note. WFL indicates word frequency level.
　　　% TG indicates "percentage of correct target answers" for the word item.
　　　% Al indicates "percentage of alternatives" for the word item.

The word item "ox" at the K3 band received the highest rate of alternatives. Sixty students (83.3%) provided "cow" or "bull" instead of the target word. It seems that the students did not perceive these words as difficult in terms of meaning when the L2

equivalent for "ox" was given in the Korean prompt. According to the interviews following the PVUT, many students responded that they confidently produced the words "cow" or "bull" without hesitation since they felt most familiar with those words. However, native speakers of English might consider the alternatives adopted by the Korean learners of English as unnatural since the words "cow" or "bull" have no connotations of "strength" and thus do not collocate well with "pulling or carrying things," which was given in the Korean prompt. Most of the students had little knowledge of how to use their alternative words "cow" or "bull" according to context, and rather focused on expressing the meaning by retrieving relevant words from their own store of vocabulary.

A similar approach to vocabulary production was also revealed in the case of the target item "wholesome." Interestingly, none of the students produced this target word; instead, they confidently provided "healthy" or "good for health," without attempting to supply other alternatives. They are more likely to feel comfortable producing the alternative words since the word "healthy" is frequently collocated with the word "food," which was presented in the Korean prompt. When asked during the interview about their familiarity with the target word "wholesome," only a small number of students responded that they experienced it in reading materials but did not know the meaning of the word.

Another item that the students attempted to replace with a number of alternatives was "chilly." However, the reason was somewhat different in that the students show a strong tendency to rely on more general terms. Judging from the interview, there are a number of possibilities that the students did not know the word but it was more a matter of uncertainly stemming from not knowing how context specific the target word "chilly" is. While worrying about the possibilities of miscommunication and hoping to make safer choices, the students preferred to choose more generalized terms that they believed could be used in a broader context.

This finding suggests that since the students were able to convey their intended meaning by employing familiar and more generalized words without having to struggle to adopt context-specific words, the words at the lower frequency bands were less likely to appear in their writing.

4.3. The Relationship Between the Productive Vocabulary and Lexical Errors in the PVLT, the PVUT, and Writing Proficiency

In order to investigate any differences in the test scores on the PVLT and the PVUT, t-test was administered. Comparing the PVLT to the PVUT, Table 4 shows a summary of the results for scores in terms of correct target words, correct words with alternatives, unanswered words and incorrect words. Significant differences were found between the test scores on the PVLT and the PVUT in all categories.

TABLE 4
***t*-Test Results for Scores in the PVLT and the PVUT**

Variable	Test	*M*	*N*	*SD*	*t*	*p*
Correct target words	PVLT	29.14	72	13.778	8.539	.000
	PVUT	20.49	72	10.720		
Correct words with alternatives	PVLT	29.14	72	13.778	-12.771	.000
	PVUT	44.10	72	15.642		
Unanswered Words	PVLT	42.32	72	20.883	5.378	.000
	PVUT	32.20	72	17.118		
Incorrect Words	PVLT	19.24	72	10.701	3.118	.003
	PVUT	15.56	72	6.887		

With regards to the target answers, the students produced more correct target words when taking the PVLT than the PVUT. This score gap indicates that the scores on the PVLT were inflated due to the help of clues in the artificial test. When test-takers were allowed to choose vocabulary freely in the PVUT, their range of vocabulary was so wide that it was difficult to expect the words measured through the PVLT to appear in learners' actual writing. This was proven by further comparison between the scores on the PVLT and recalculated scores including correct alternatives on the PVUT. There was a dramatic increase in the score on the PVUT from 20.49 to 44.10. Clearly, it is difficult to accept that the size of vocabulary estimated by the PVLT at a certain word frequency level is entirely reliable. The findings of this study urge caution in interpreting the scores on the PVLT since they measure productive vocabulary knowledge in different ways, such as meaning-form connection.

As for unanswered words, the students left significantly more blanks in the PVLT, which implies that there was no choice but to leave the test items blank from not knowing the required words. This is because only predetermined words starting with given letters were allowed in the PVLT. Although they successfully grasped the meaning of the test sentence and knew what kinds of words were required according to context, their meaning-based approach to vocabulary production was hindered. On the contrary, in the PVUT the students performed the writing task by retrieving relevant words from their own store of vocabulary according to context. If they were unable to produce the words they wanted to use, they attempted to answer by providing proper alternatives or circumlocutions.

Leaving test items unanswered may not necessarily be representative of students' lack of vocabulary knowledge, since it could potentially be worse if the students left fewer blanks but produced more incorrect words. Therefore, errors related to improper word choice should be counted and considered at the same time for a more accurate measure of the students' productive vocabulary knowledge. As seen in Table 4, significant differences were identified between the PVLT and the PVUT for both the categories of unanswered words and incorrect words, with fewer errors made on the PVUT. This is arguably because

the students did not have to struggle with the production of target words starting with a few given letters, but were able to choose vocabulary in connection with the relationships to the surrounding words according to context. This was enabled and facilitated by the context-rich Korean prompts with relevant pictures.

More importantly, viewed together, these findings suggest that the students tried to be more responsible writers employing as much of their lexical knowledge as possible when completing the PVUT. This type of writing task can empower student writers to think effectively about vocabulary options as well as all the aspects required for writing, such as sentence organization, grammar, collocations, and style. The students' performance in terms of productive vocabulary in the PVLT and the PVUT was also analyzed with regard to their writing proficiency level. Table 5 presents descriptive statistics for scores in terms of correct target words, unanswered words, and incorrect words according to proficiency levels.

TABLE 5
Comparisons of Scores Across Proficiency Levels Between the Two Tests

Test	Variable	Mean of High Proficiency	Mean of Low Proficiency	p
PVLT	Correct words	38.42	24.47	.011
	Unanswered words	30.55	50.67	.016
	Incorrect words	19.78	16.66	.695
PVUT	Correct words	27.86	16.63	.008
	Alternative words	26.28	20.62	.049
	Unanswered words	23.85	38.82	.034
	Incorrect words	14.35	14.80	.983

To summarize, the results showed that the students with a higher writing proficiency (n = 12) produced more correct target words (p = .011, p = .008) and left fewer unanswered words (p = .016, p = .034) in both tests. In the PVUT, particularly, they participated more actively in the writing task by using more alternatives (p = .049) in a semantically and grammatically correct way, consequently leading to fewer unanswered words. This implies that the students with a higher writing proficiency were better able to connect their intended meaning and its form than those of a lower writing proficiency (n = 29). Instead of giving up, the students with a higher writing proficiency made the most of their limited vocabulary they possessed in order to describe as closely as possible the given context. In that regard, in addition to correct target words, the analysis of correct alternatives produced by students might be another effective indicator in differentiating their writing proficiency level since it is thought to reflect their true vocabulary knowledge and the processing of their thoughts in terms of L1.

5. CONCLUSION

The present study explored what types of words the students produced and lexical errors they made in the two different productive vocabulary assessment tools: the PVLT and the PVUT. The students were asked to take the PVLT (version A) at the K2, K3, K5 and UWL frequency levels and then write a reflection paper to identify how they perceived the PVLT. In order to compare vocabulary and lexical errors as measured in the writing-induced test, the students were asked to perform translation tasks, where the target words were drawn from version B of the PVLT at the corresponding band, and write a reflection paper. To investigate the students' vocabulary performance in the PVLT and the PVUT and their writing proficiency, the students were also asked to write an essay. All essays were evaluated by two native speakers of English based on the TOEFL writing scoring guide and students were grouped according to proficiency.

First, productive vocabulary and lexical errors at all word frequency levels in the PVLT were analyzed in both quantitative and qualitative ways. Since the PVLT provides both initial letters of the target words and sentence context, this test format helped elicit the target words from students. However, such a format could also be a distraction in that the students' first response out of familiarity with the given initial letters prohibited them from thinking about potentially better options. With respect to lexical errors, many students showed a lack of clear understanding of the use of verb tense, voice, and collocations. In particular, a number of students had difficulty recognizing the difference between words that belonged to the same part of speech but had subtle differences in meaning. Throughout the study, it appeared prevalent that whether or not it was grammatically correct, the students repeatedly resorted to familiarity when selecting answers.

Second, to investigate the students' performance in the writing-induced method, their productive vocabulary and lexical errors made at all word frequency levels in the PVUT were also analyzed in both quantitative and qualitative ways. Unlike the PVLT, a meaning-form connection test of vocabulary, the PVUT assesses a more complex knowledge of vocabulary embedded in writing; this expanded workload placed a larger burden on the students. Although they may be confident in a single word, they had no choice but to give up producing an answer when unable to incorporate it into phrases and sentences. The students also had difficulty with the multiplicity of meanings for some target words. It was found that the students had confidence in the meaning of the target word only when it was given in a familiar context. In addition, the students were concerned about whether or not their choice of vocabulary was proper in a given context. For this reason, the students showed a strong tendency to choose more general terms as alternatives that they believed could be used in wider contexts.

With regards to the lexical errors in terms of grammatical use, it was found that the

students made many mistakes involving subject-verb agreement, voice, tense, and morphology. However, when asked questions regarding their mistakes during the interview, the majority of the students recognized and corrected them. It is arguably presumed that the students' knowledge of vocabulary, when words were familiar and relatively easy, was primarily receptive and thus was not put into use for correct production during the tests.

The students' performance in the PVLT and the PVUT was also analyzed with regards to their writing proficiency level. The results showed that the students with a higher writing proficiency produced a higher number of correct target words and left fewer unanswered words in both tests. More specifically, in the PVUT, they completed the writing task by using more alternatives in a grammatically correct manner. This is because the students were more likely to choose words they felt more confident with producing in terms of grammar and collocations. However, the scores for incorrect words in the PVLT and the PVUT were not an effective means by which to differentiate between the two groups for writing proficiency.

The findings of this study can be seen to provide teachers with insights into how to adopt appropriate assessment methods according to specific purposes. Self-generated and artificially-induced vocabulary should be interpreted differently, since the productive vocabulary knowledge required for each is different. Considering the importance of students' ability to incorporate their vocabulary into practical use, the PVUT can be a feasible option for measuring self-generated productive vocabulary. This writing-induced method assists in investigating what words learners actually choose when prompted by the L1 equivalents of the L2 target words, rather than simply indicating whether the students are able to connect the form and the meaning of the target word items. More attention should be given to learners' frequently used words since those words can have greater influence on production and thus are likely to be a real indicator of their vocabulary production in writing. Moreover, the PVUT can be an effective assessment method since it shows whether learners actually know the grammatical and semantic relationships between their chosen vocabulary and the surrounding words. Based on the test results, teachers can provide more explicit instruction so as to improve the students' vocabulary knowledge and writing.

This study attempts to provide an alternative measure for productive vocabulary knowledge by showing how the students' performance differs in the two assessment tests; and thus urges caution in interpreting the scores, particularly in terms of vocabulary production in writing. However, this study was conducted with a limited number of students and only one writing task. Therefore, it would be meaningful to replicate this study with a larger number of students at varying academic levels and with different writing topics. In addition, a more detailed analysis of types of lexical errors is recommended for further research, since the relationship between lexical errors and writing

evaluation is not yet clearly identified (Engber, 1995). By raising awareness of vocabulary issues affecting students' writing, teachers and learners can gain more practical insight into how to successfully improve writing.

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APPENDIX

Productive Vocabulary Levels Test (Version A)

The 2000-word level

1. I'm glad we had this opp_____ to talk.

2. There are a doz_____ eggs in the basket.

3. Every working person must pay income t_____ .

4. The pirates buried the trea_____ on a desert island.

5. Her beauty and cha_____ had a powerful effect on men.

6. La_____ of rain led to a shortage of water in the city.

7. He takes cr_____ and sugar in his coffee.

8. The rich man died and left all his we_____ to his son.

9. Pup_____ must hand in their papers by the end of the week.

10. This sweater is too tight. It needs to be stret_____ .

11. Ann intro_____ her boyfriend to her mother.

12. Teenagers often adm_____ and worship pop singers.

13. If you blow up that balloon any more it will bur_____ .

14. In order to be accepted into the university, he had to impr_____ his grades.

15. The telegram was deli_____ two hours after it had been sent.

16. The differences were so sl_____ that they went unnoticed.

17. The dress you're wearing is lov_____ .

18. He wasn't very popu_____ when he was a teenager, but he has many friends now.

The 3000-world level

1. He has a successful car_____ as a lawyer.

2. The thieves threw ac_____ in his face and made him blind.

3. To improve the country's economy, the government decided on economic ref_____ .

4. She wore a beautiful green go_____ to the ball.

5. The government tried to protect the country's industry by reducing the imp_____ of cheap goods.

6. The children's games were funny at first, but finally got on the parents' ner_____ .

7. The lawyer gave some wise coun_____ to his client.

8. Many people in England mow the la_____ of their houses on Sunday morning.

9. The farmer sells the eggs that his he_____ lays.

10. Sudden noises at night sca_____ me a lot.

11. France was proc_____ a republic in the 18th century.

12. Many people are inj_____ in road accidents every year.

13. Suddenly he was thru_____ into the dark room.

14. He perc_____ a light at the end of the tunnel.

15. Children are not independent. They are att_____ to their parents.

16. She showed off her sle_____ figure in a long narrow dress.

17. She has been changing partners often because she cannot have a sta_____ relationship with one person.

18. You must wear a bathing suit on a public beach. You're not allowed to be na_____ .

The 5000-world level

1. Soldiers usually swear an oa_____ of loyalty to their country.

2. The voter placed the ball_____ in the box.

3. They keep their valuables in a vau_____ at the bank.

4. A bird perched at the window led_____.

5. The kitten is playing with a ball of ya_____.

6. The thieves have forced an ent_____ into the building.

7. The small hill was really a burial mou_____.

8. We decided to celebrate New Year's E_____ together.

9. The soldier was asked to choose between infantry and cav_____.

10. This is a complex problem that is difficult to compr_____.

11. The angry crowd sho_____ the prisoner as he was leaving the court.

12. Don't pay attention to this rude remark. Just ig_____ it.

13. The management held a secret meeting. The issues discussed were not disc_____ to the workers.

14. We could hear the sergeant bel_____ commands to the troops.

15. The boss got angry with the secretary and it took a lot of tact to soo_____ him.

16. We do not have adeq_____ information to make a decision.

17. She is not a child, but a mat_____ woman. She can make her own decisions.

18. The prisoner was put in soli_____ confinement.

The University Word Level

1. There has been a recent tr_____ among prosperous families toward a smaller number of children.
2. The ar_____ of his office is 25 square meters.
3. Phil_____ examines the meaning of life.
4. According to the communist doc_____, workers should rule the world.
5. Spending many years together deepened their inti_____.
6. He usually read the sports sec_____ of the newspaper first.
7. Because of the doctors' strike, the cli_____ is closed today.
8. There are several misprints on each page of this te_____.
9. The suspect had both opportunity and mot_____ to commit the murder.
10. They insp_____ all products before sending them out to stores.
11. A considerable amount of evidence was accum_____ during the investigation.
12. The victim's shirt was satu_____ with blood.
13. He is irresponsible. You cannot re_____ on him for help.
14. It's impossible to eva_____ these results without knowing about the research methods that were used.
15. He finally att_____ a position of power in the company.
16. The story tells about a crime and subs_____ punishment.
17. In a hom_____ class all students are of a similar proficiency.
18. The urge to survive is inh_____ in all creatures.

Applicable levels: Secondary

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