Role of Vocabulary Levels Test (VLT) in Chinese Undergraduate Students' Comprehension of Textbooks

Jiangfeng Liu

Jiangsu University of Technology, Changzhou, China

Abstract—Vocabulary knowledge has always been considered crucial in reading comprehension. This paper aims to link Chinese learners' performance on Vocabulary Levels Test (VLT) to the profiling of their textbook so as to draw pedagogical implications on English teaching. The participants were 108 freshmen in Jiangsu University of Technology, China. All of them took part in the VLT, and their English textbook was profiled to see the lexical level of the vocabulary. Results showed that 81.48% of the participants had mastered the 2,000-word level, and the vocabulary of the textbook was within the vocabulary knowledge of the participants. However, results also indicated that no participants had reached the mastery level of the K-3, K-5 and AWL words. Based on the findings of the research, it was suggested that the language teacher could make use of the textbook to consolidate the participants' K-1 to K-2 words and at the same time give them more exposure to K-3 to K5 words as well as academic words by exposing them to some extra materials.

Index Terms—vocabulary, vocabulary size, Vocabulary Levels Test (VLT), reading comprehension, profiling

I. INTRODUCTION

In the past two decades, vocabulary in second language learning has attracted more and more interest of both researchers and language teachers. It plays a fundamental and complex role in both first and second language learning. According to Schmitt (2013), there are two dimensions of vocabulary knowledge, one being breath (size) and the other being depth (knowledge). Breath refers to how many words a learner knows at a particular lexical level while depth means how well a learner knows about a certain word. Vocabulary breath is very important for second language learners in that when they attempt to understand a certain text, how many words they know in the text is likely to influence their comprehension. Many researchers and scholars have conducted research to investigate the relationship between learners' vocabulary size and their performance on reading comprehension (Hu & Nation, 2000; Nation, 2001; Qian, 2002; Zhang & Annual, 2008). It is claimed that most second language learners need to know at least 95% of words in a particular text in order to achieve an adequate understanding of the text (Hu & Nation, 2000; Nation, 2001), and learners' vocabulary size, in most cases, significantly correlates to learners' reading comprehension (Qian, 2002; Zhang & Annual, 2008; Alavi & Akbarian, 2012). Vocabulary Levels Test (VLT) (Nation, 2001) is a validated and reliable test, which aims to measure language learners' receptive knowledge of vocabulary at particular lexical levels. Although most of the researchers have examined the correlation of learners' performance on VLT and reading comprehension, only a handful of them connect students' performance on VLT with the profiling of the textbook so as to draw implications for pedagogy.

This research, by administering VLT to 108 undergraduate students in a university in China, seeks to find out the vocabulary size of the participants at 2,000 (2K), 3,000 (3K), 5,000 (5K), 10,000 (10K) and academic word (AW) levels. And then by comparing the participants' performance on VLT with the profiling of the textbook they use, the researcher aims to draw possible pedagogical implications for teaching.

II. THEORETICAL BACKGROUND

In this part, firstly some important terminologies will be introduced to better understand the concept of vocabulary. Secondly, the relationship between vocabulary size and reading comprehension will be elaborated on using previous research in this field. Finally, the gap in the previous research will be identified along with the significance and purpose of the present research.

A. Understanding Vocabulary

Vocabulary refers to the set of words known and used by a particular person within a language (Schmitt, 2013). Vocabulary plays both a significant and complex role in not only first language learning but also second language acquisition. When it comes to what vocabulary means, some very specialist terminologies should be introduced to achieve a better understanding of it, such as tokens, types, lemmas and word families. Please look at the following example: The dog loves the ball.

In this sentence, there are five separate words, so this sentence contains five tokens. When counting the number of separate words in a text, words are often called tokens. This way of counting words is very useful since it helps learners figure out how many words there are in a passage, how many words they have written for an essay and how large a corpus is.

When deciding how many word types in the above example, it is the number of different words in this sentence that counts rather than the number of separate words. Therefore, in the above example, although it has five tokens, it only contains four types since the word 'the' occurs twice. When measuring second language learners' vocabulary size, types are more significant than tokens in that much more attention is paid to how many words a particular learner can produce regardless of repetitions (Moghadam, Zainal & Ghaderpour, 2012).

Lemma refers to the head or root of a word and all of its inflections, but the part of speech of this word must not be changed. For example, in English, the lemma of the word "judge" would include 'judging', 'judges' and 'judged', but 'judgment' does not belong to its lemma because 'judgment' is a noun but not a verb.

Word family usually concludes the base word, all of its inflections and derivatives regardless of its part of speech (Schmitt, 2013), so the word family of 'judge' includes 'judge', 'judges', 'judging', 'judged' and 'judgment'.

B. Vocabulary Size and Reading Comprehension

As Schmitt states, "reading is an important part of all but the most elementary of vocabulary programs" (2013, p. 150). Vocabulary knowledge has always been crucial for second language learners in reading comprehension since a learner must know most of the words in a running text so as to comprehend a certain text. Therefore, inadequate vocabulary will undoubtedly influence second language learners' reading performance in a negative way. Although the exact percentage has not been established, recent research has shown the significant role of vocabulary size in reading comprehension. According to Nation (2001), learners with a vocabulary size of more than 3000 words can read with ease because in most situations it gives coverage of at least 95% of a running text. Similarly, Hu & Nation (2000) created four coverage groups (80%, 90%, 95%) by replacing some words in the text with words beyond participants' vocabulary knowledge, and found that most L2 English learners would need 98% text coverage to achieve adequate comprehension of a particular text. Qian (2002), by administering Vocabulary Levels Test to a group of Chinese and Korean L2 learners, concluded that the participants' reading comprehension score was highly correlated to the score of VLT. Zhang & Annual (2008) conducted a research study among a group of secondary students in Singapore by using the Vocabulary Levels Test, and found that the students' vocabulary knowledge at the 2K and the 3K word levels was highly correlated to their reading comprehension. Alavi & Akbarian (2012) investigated the relationship between learners' vocabulary size and their performance on TOEFL reading item types. It was found that participants' performance on the TOEFL reading items (guessing vocabulary, stated detail and main idea) correlated to their overall performance in VLT.

The findings of the previous research indicate that second language learners' vocabulary size greatly impacts their reading comprehension. If a text contains too many difficult words beyond learners' vocabulary knowledge, it will definitely hinder their understanding of the text, thus negatively influence their second language learning. A reasonable coverage of known words in a running text will not only help with learners' reading comprehension but also yield a better learning effect. Although previous research has worked out the role of vocabulary size in reading comprehension, only a handful of them connected participants' performance on VLT with the profiling of the textbook to see whether some implications for pedagogy could be found. Therefore, the present study seeks to measure the vocabulary size of a group of first-year undergraduates in Jiangsu University of Technology, China. Based on the results of their performance on VLT, their textbook will then be profiled to see the lexical levels of the vocabulary. By making comparison of students' vocabulary level and the lexical level of their textbook, this research aims to make conclusions as to whether the textbook fits the students' vocabulary needs and make possible pedagogical implications.

III. METHODOLOGY

In this part, the research setting, the participants, the materials used and the research procedure of this study will be described.

A. Research Setting

The research was conducted in Jiangsu University of Technology, a university in the southeastern part of China. Similar to other schools, the college puts emphasis on college English teaching and has a regulation that only if students pass the College English Test Band Four (CET-4) can they get the bachelor's degree when they graduate. During the past five years, college English teaching has gone through a lot of reform and the students in the college achieved higher CET-4 passing rate due to the joint efforts made by the administrators and the English teachers. In the current semester, the students are asked to use a newly published set of English textbooks. Therefore, the purpose of this research is to find out the actual vocabulary size of the participants at particular lexical levels by using Paul Nation's VLT so as to see whether the new English textbook fits the students' current vocabulary level.

B. Participants

The participants were first-year undergraduate students (N=108) who are non-English majors studying in Jiangsu University of Technology. The participants included 56 male students and 52 female students with ages ranging from 19 to 21. Most of them began to study English in the third year in primary school, and some began in the first year. They were from three different classes but utilizing the same textbook. They were told the purpose of the research and any data collected would only be used for research purposes. And they were further told that they could withdraw the study at any point if they felt uncomfortable and their performance on the VLT would not be counted as part of their final score for this semester. A consent form was signed at the initial stage of the study.

C.   Materials

Two kinds of materials were used in this research. One was the Vocabulary Level Test (VLT) and the other was the new English textbook used by the participants as their learning material for the college English class.

1. Vocabulary Levels Test (VLT)

VLT measures the participants' receptive knowledge of vocabulary at five different levels including 2K, 3K, 5K, 10K and academic word levels. VLT was chosen because it is practical, economical, and easy to administer and interpret (Schmitt, N. et al, 2011). And VLT can show the participants' general vocabulary knowledge regardless of their learning background (Lauder & Nation, 1999). At each level, there are 10 three-item clusters with three definitions on the right side and six words on the left (See Figure 1). Therefore, a number of 30 words were tested at each level.

```
Participants must choose the right word that goes with each meaning. They must write the number
of that word next to its meaning. Here is an example.
1. copy
2. event                    _____ end or highest point
3. motor                    _____ this moves a car
4. pity                     _____ thing made to be like another
5. profit
6. tip
```
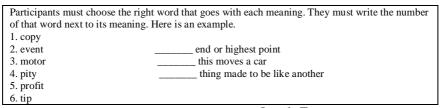
Figure 1 A sample of Vocabulary Levels Test

A score on each level of VLT indicates the number of words known at that particular level. For example, if a student gets 15 words correct, s/he knows 50% words at that level. Getting 24 words correct at a level of VLT indicates a mastery of that particular level (Lauder & Nation, 1999).

2. Textbook used by participants

The textbook used by the participants is *New Century College English---Zooming In: An Integrated English Course (Book 2 Second Edition)* which was published by Shanghai Foreign Language Education Press in 2014. There are altogether eight units in this book and each unit has two reading texts, Text A and Text B.

3 Procedure

In the first step, the participants were asked to do the Vocabulary Level Test administered by their English teacher in class. The students were given 60 minutes to complete all the tasks and when they finished, the test papers were collected and double-scored by the researcher and the teacher so as to ensure the reliability of the test results (Fulcher, 2010). The students' performance for each level was reported separately. In the second step, the students' English textbook, *New Century College English---Zooming In: An Integrated English Course (Book 2 Second Edition)* was profiled by using an online software called VP-Compleat on a website, *www. lextutor. cn* developed by Paul Nation. This website is well known around the world and quite popular among researchers and scholars in the field of language teaching and learning. The software analyzed all the vocabulary in Text A and Text B and a result of the lexical level of all the vocabulary in the textbook was presented. Finally, based on the results of the students' performance on the VLT and the profiling of the textbook, discussions were made on whether the new textbook fits students' current vocabulary level along with some pedagogical implications.

IV.   RESULTS

A.   Students' Performance on VLT

Although the participants have completed five levels of VLT including the 2K, 3K, 5K, 10K and AW levels, the 10K word level would not be reported here because it was far beyond the participants' vocabulary level and many participants just gave up this part by not answering the questions. Therefore, only four levels of vocabulary (2K, 3K, 5K and AW) were reported in this study for it fitted not only the participants' vocabulary level but also the textbook's vocabulary range. Table 1 presents the descriptive statistics of student performance on VLT including the mean score and the percentage of students who have got the mastery level by getting 24 items correct in each level.

TABLE 1
DESCRIPTIVE STATISTICS OF STUDENT PERFORMANCE ON VOCABULARY LEVELS TEST (N=108)

Level	Full mark	Mean	Percentage of mastery
2K	30	27.31	81.48%
3K	30	16.72	0%
5K	30	11.23	0%
AWL	30	9.89	3.44%

From Table 1, it can be seen that the participants didn't do very well on the VLT. Only the mean score for the 2,000-word level has reached the criteria of mastery. The mean scores for the 3K, 5K and AW levels are much lower than it is for the 2K word level given the maximum possible scores of 30. Besides, 81.48% of the participants achieved mastery on the 2K word level while no participants got 24 items correct concerning the 3K and 5K word levels. For AWL, although the highest score the participants got was 28, the mastery percentage, 3.44%, is quite low.

B.   Profiling of the Textbook

The English textbook, *New Century College English---Zooming In: An Integrated English Course (Book 2 Second Edition)* has eight units, and the texts in each unit was scanned and profiled by using the software VP-Compleat on a website, *www. lextutor. cn* developed by Paul Nation. Table 2 presents the lexical distribution of the participants' textbook by using a Classic (GSL/AWL) profiling model.

TABLE 2
THE LEXICAL DISTRIBUTION OF THE PARTICIPANTS' TEXTBOOK: CLASSIC (GSL/AWL)

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words	621 (60.29)	950 (52.90)	7542 (85.24)	85.24
K-2 Words	266 (25.83)	307 (17.09)	442 (5.00)	90.24
AWL [570 fams] TOT 2,570	143 (13.88)	171 (9.52)	316 (3.57)	93.81
Off-List:	??	417 (23.22)	548 (6.19)	100.00
Total (unrounded)	1030+?	1796 (100)	8848 (100)	100.00

It can be seen from the table that the vocabulary in the participants' textbook is mostly high-frequent words with 90.24% of K-1 and K-2 words. Besides, the AWL only takes up 3.57% of the total vocabulary. For the off-list words, they account for 6.19%, which is a quite reasonable considering the fact that there are some proper nouns in the texts such as America, New Zealand, Africa and so on.

Table 3, by adopting the BNC (1-20K) model of profiling, presents the lexical distribution of K-1, K-2, K-3 and K-4 words of the participants' textbook. According to Table 3, K-3 words accounts for only 2.51% of the total vocabulary and the most frequent K-1, K-2 and K-3 words take up 94.36% of the total vocabulary.

TABLE 3
THE LEXICAL DISTRIBUTION OF THE PARTICIPANTS' TEXTBOOK: BNC (1-20K)

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	643 (46.36)	983 (53.08)	7623 (84.87)	84.87
K-2 Words :	330 (23.79)	389 (21.00)	627 (6.98)	91.85
K-3 Words :	151 (10.89)	165 (8.91)	225 (2.51)	94.36
K-4 Words :	94 (6.78)	100 (5.40)	130 (1.45)	95.81

V.   DISCUSSION

According to the participants' performance on the VLT, the results suggest that most of the participants have achieved mastery on the most frequent 2K word level. And considering that about 90% of the textbook vocabulary consists of words on the K-1 and K-2 word levels, most of the students might not find it difficult to understand the texts. Based on the result in Table 3, K-3 words take up only 2.51% of the total vocabulary. Although the participants did not do very well at the K-3 level of the VLT, this might not negatively impact their understanding of the textbook. According Zhang & Annual (2008), K-2 and K-3 words are highly correlated to their reading comprehension. Therefore, most of the participants are more likely to understand the textbook without much difficulty.

Additionally, based on the result in Table 3, words at the K-1, K-2 and K-3 word levels cover a percentage of 94.36 which is consistent with the finding of Nation (2001), K-1, K-2 and K-3 words, in most situations, give coverage of 95% of a running text.

The AWL words in the textbook only takes up 3.57%, which matches the students' current performance on the AWL on the VLT, but it suggests that the textbook might not be a good material for the participants in enlarging their academic vocabulary.

VI. PEDAGOGICAL IMPLICATIONS

Although the relatively small sample of the research design might restrict the generalizability of the findings, some pedagogical implications could still be drawn to schools with students of the same proficiency level and using similar textbooks.

Firstly, although most of the students have mastered words on the 2K word level of the VLT, still some of them scored relatively low, so it is suggested that teachers should still focus on the K-1 to K-2 level words by exposing the students to these words in their daily teaching. Besides, extra vocabulary training and practice should be provided to the group of students who scored less than 24. Secondly, since the students' performance on the K-3 and K-5 levels was unsatisfactory, they might not be able to comprehend more complicated articles or texts. The textbook with coverage of nearly 95% K-1 to K-3 words can help them build up their vocabulary of the K-3 level. Therefore, the teachers should make good use of this textbook, putting emphasis on those frequently used words on the K-1 to K-3 level by guiding the students constantly review and using these words in context until they fully grasp these words. Meanwhile, the teachers should carefully select some readings from newspapers or magazines which fit the students' needs and give them to the students as extra reading, thus facilitating students' sensitivity to and understanding of words at the K-3, K-4, and K-5 levels (Zhang & Annual, 2008). Thirdly, concerning the students' performance on the AWL, it is found that a majority of the students hardly had any knowledge of academic vocabulary. Since the textbook cannot provide enough academic words for the students to learn, and considering that academic words are very important in a university context, it is suggested that the teachers should deliberately add some academic vocabulary learning into their teaching practice so as to help the students grasp more academic words.

VII. CONCLUSION

In this research, firstly the participants' vocabulary was measured by Paul Nation's VLT, and then the textbook was profiled to see the lexical distribution of the vocabulary. Based on the participants' performance on the VLT, it was concluded that most of the participants achieved the mastery level of the 2K words, while their performance on the 3K, 5K and AW levels was quite unsatisfactory for no participants reached the mastery level. The results suggested that these participants needed more instruction and practice on the frequently used K1 to K3 words first and then K3 to K5 and academic words might also be incorporated into the daily teaching step by step. The lexis of their textbook is normally distributed, with K1 to K2 words accounting for about 91%. Therefore, the textbook fits the students' current level and it is reasonable that a little bit beyond the participants' vocabulary level can efficiently facilitate their English learning. It is suggested that the teachers should not only make good use of the textbook but also deliberately find some extra materials for enlarging the students' vocabulary, for example, to find suitable material from newspapers and magazines and to add academic words into their teaching syllabus.

Vocabulary knowledge, which is proved to be a predictor of learners' language proficiency, plays a significant role in language learning. Language teachers should pay special attention to students' vocabulary learning, assisting them with appropriate and effective ways to learn and enlarge their vocabulary. Considering students' vocabulary level when teaching second language is very crucial for successful teaching and learning. This research, by making an attempt to link learners' vocabulary size at particular levels to the profiling of the textbook, might serve as a good method for choosing teaching materials and design teaching syllabus in a second or foreign language context.

Although the sample is relatively small, which might negatively influence the generalizability of the findings, this study represents a group of undergraduates who are in the same English proficiency level in a Chinese university context. Based on the findings of this research, future research could focus on the growth of the participants' vocabulary after a certain period of time.

REFERENCES

[1] Alavi, S. M. & Akbarian, I. (2012). The role of vocabulary size in predicting performance on TOEFL reading item types. *System* 40, 376-385.
[2] Fulcher, G. (2010). Practical language testing. London: Hodder Education.
[3] Hu, M. & Nation, I. S. P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language* 13, 403-430.
[4] Laufer, B., Nation, P. (1999). A vocabulary size test of controlled productive ability. *Language Testing* 16, 36-55.
[5] Moghadam, S. H. & Zainal, Z. & Ghaderpour, M. (2012). A review on the importance role of vocabulary knowledge in reading comprehension performance. *Procedia- Social and Behavioral Sciences* 66, 555-563.
[6] Nation, I. S. P. (2001). Learning vocabulary in another language. Cambridge: Cambridge University Press.
[7] Qian, D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: An assessment perspective. *Language Learning* 52, 513-536.
[8] Schmitt, N. & Jiang, X. & Grade, W. (2011). The percentage of words known in a text and reading comprehension. *The*

Modern Language Journal 95, 26-43.

[9]   Schmitt, N. (2013). Vocabulary in Language Learning. Cambridge: Cambridge University Press.

[10] Xin, X. B., Zhang, H. J. (2014). New Century College English---Zooming In: An Integrated English Course (Book 2 Second Edition). Shanghai: Shanghai Foreign Language Education Press.

[11] Zhang, L. J. & Annual, S. B. (2008). The role of vocabulary in reading comprehension: the case of secondary school students learning English in Singapore. *SAGE Publications* 39.1, 51-76.

Jiangfeng Liu was born in Yangzhou, Jiangsu Province, China, in 1983. Her main research interests are EFL teaching and testing. She is now working as a lecturer in Jiangsu University of Technology, Changzhou, China. Currently, she is studying her master's degree, majoring in TESOL at Xi'an Jiaotong Liverpool University, Suzhou, China, and will graduate in January, 2016. In recent years, she has taken a keen interest in English teaching and testing research, and published several related papers.