

An Investigation into the Vocabulary
Needs of University Students
in Hong Kong

HKALSE English
grade correlate
well with vocabulary
test score

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There have been continuous complaints about the declining English standard of Hong Kong students, including those who are in schools and in the university. The main aim of this study is to investigate the vocabulary knowledge of tertiary students and to find out whether they need help with vocabulary for their academic studies. This study involved more than one thousand students newly admitted to the seven tertiary institutions of Hong Kong. The main instrument for data collection was Paul Nation's Word Levels Test (long version), copies of which were mailed to the participants. Findings of the study confirm the validity and reliability of the Test. They indicate a positive and significant correlation between language proficiency and vocabulary scores. While vocabulary will not be a major source of difficulty for many students from English medium schools, it has been found that both students in Chinese medium schools and those who score E grade in English in the Hong Kong Advanced Level Examination need help with vocabulary, particularly academic vocabulary. Implications of these and other findings for teaching in the Hong Kong context are also discussed.

Introduction

Although the Hong Kong Government has made a lot of effort to raise the English standard of students in schools, there have been continuous complaints from various sectors of society about the declining standard of English. With the rapid expansion of tertiary education in recent years,

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there has also been a growing concern about whether students are proficient enough in English to receive education in the tertiary institutions where English is widely used as the medium of teaching. This problem is bound to be more acute with the recent implementation of the new policy of medium of teaching; the majority of secondary schools have switched to Chinese instead of English as the medium of instruction.

Students in Hong Kong will take the Hong Kong Certificate of Education Examination (HKCEE) when they finish their secondary schooling and those who intend to further their study in the university will sit for the Hong Kong Advanced Level Examination (HKALE) at the end of the Matriculation course. English language is one of the compulsory subjects in these examinations, the results of which may indicate the English proficiency of the students. Knowledge of English vocabulary, however, is not assessed on its own. To assess or measure students' vocabulary knowledge, an independent vocabulary test needs to be employed. The following section will first discuss briefly the various kinds of vocabulary tests related to language teaching before describing the test selected for the present study.

Vocabulary Tests

Read (1993, pp. 355–358), classifies existing vocabulary test formats based on four dimensions: (1) simple to more complex test formats, (2) verifiable responses vs. self-reports, (3) breadth and depth of knowledge, and (4) testing in context vs. testing in isolation. It would be ideal to employ a vocabulary test which can test as many words as possible in a short period of time, allow students to show in some verifiable way that they know what the word means, test not only the size but also the quality of vocabulary knowledge, and test words in context instead of in isolation. However, it is almost impossible to have such an ideal vocabulary test because there are always both strengths and limitations in a given vocabulary test. For example, the yes/no or checklist format (Anderson & Freebody, 1983; Meara & Buxton, 1987) can test many words within a short period of time but the answers cannot be verified. For another example, testing words in context is able to show students' ability to understand words in discourse, but it takes longer time and reduces the number of items that can be tested. The same limitations exist in tests which assess the quality of the learners' vocabulary (for example, Read, 1993; Wesche & Paribakht, 1996). It may therefore be said that assessing

word knowledge is not a simple task as the nature of word knowledge is too complicated for any one vocabulary test to capture. The use of a certain kind of vocabulary test depends entirely on what the user's purpose is and how various kinds of factors are weighed.

Closely related to these dichotomies is the distinction between receptive and productive knowledge of words. Although some researchers (for example, Meara, 1990, p. 153) are of the contention that passive vocabulary is qualitatively different from active vocabulary, it is widely agreed that the distinction between knowing a word actively and knowing a word passively is a gradual one (Palmberg, 1987, p. 201; Melka, 1997, pp. 84–101). Recently, tremendous efforts have been put in designing tests to measure knowledge of both passive vocabulary (Nation, 1983; 1990) and active vocabulary (Laufer, 1995; Laufer & Nation, 1995), and these tests have been used by practising teachers and researchers for different purposes.

The LEAP Project, which aimed at collecting information about the English language experiences and proficiency of students who entered universities in Hong Kong, employed the short version of the Vocabulary Levels Test on "semi productive" vocabulary (Laufer & Nation, 1995) to find out the first-year students' productive vocabulary in writing. Results suggested that "many Hong Kong students operate with a limited knowledge of vocabulary" (Littlewood & Liu, 1996, p. 55). The studies of Barber (1999) as well as Cobb and Horst (2000) employed Nation's Word Levels Test on passive vocabulary knowledge. Barber (1999) looked at the relationship between vocabulary knowledge and HKCEE results and he found a positive correlation between them. Cobb and Horst's study, which related to tertiary students, attempted to determine how many high-frequency word families the students knew and whether the students who had studied English longer knew more words. Their study indicated that "the students knew virtually all of the 2,000 most basic word families of English," and "performance at the 3000 and 5000 levels was also high. Significant differences were found between the two groups at the 3000 and 5000 word levels while no significant differences were found at the UWL level" (p. 4). However, as the subjects under study involved only 21 Year One and 28 Year Two "higher intermediate" students, findings of the study may only be relevant to this particular group. To obtain reliable information about the passive vocabulary knowledge of Hong Kong tertiary students in general, a study using a much larger and more representative sample is required.

Research Questions

This study focuses on the English vocabulary proficiency of Hong Kong students. In particular, it intends to find out whether undergraduates who get admitted into the university still need help with English vocabulary, particularly academic vocabulary. It seeks answers to the following four questions:

- a) Do the students newly admitted to the university need help with general and academic vocabulary for their study?
- b) In what way is knowledge of academic vocabulary related to knowledge of vocabulary at other word levels?
- c) What are the vocabulary needs of students of different levels of language proficiency?
- d) Are there any differences between respective students from English and Chinese medium schools in vocabulary knowledge?

Method

This section will describe in detail the subjects, instruments for data collection, procedures, and analysis involved.

Subjects

Five thousand students were invited to take part in the study. These students constituted about half of the total number of students who had been newly admitted in the same academic year to the degree programmes of the 7 tertiary institutions in Hong Kong including City University, Lingnan College, the Chinese University of Hong Kong, the Hong Kong Baptist University, the Hong Kong Polytechnic University, the University of Hong Kong, and the Hong Kong University of Science and Technology. These five thousand students were selected in proportion to the student intake of the individual institutions. They were systematically selected according to the alphabetical order of their family names. The students who finally agreed to take part in the study amounted to 1,076 in total, 40% of whom were males and 60% females.

All these students took the HKALE, which is used for selecting students for tertiary education, and, according to their self-reports, their English results were as follows:

Table 1 English Proficiency of Subjects (HKALE)

Grades	Frequency	Percentages
A	22	2.1
B	96	9.0
C	221	20.7
D	471	44.2
E	256	24.0
Total	1,066	100.0

The English grades in the table range from A (the top grade) to E (the lowest passing grade). Of the 1,066 students who reported their English results, the majority of them (68%) scored D and E grades while slightly more than 10% of them earned A and B grades. These results to a great extent reflect the English performance of the students admitted to tertiary education in Hong Kong. As the proportion of A, B, C, D, and E grades awarded to the student population in the same academic year was 2%, 6.2%, 18.20%, 44.4%, and 29.3% respectively, the proportion of B and C grade students in the sample was slightly greater and that of E grade students was marginally smaller. It may therefore be said that the language proficiency of this group of students as a whole was slightly higher than that of the general student population.

The students under study came from both the Chinese and English medium schools and their distributions are as follows:

Table 2 Subjects by Medium of Learning

Medium	Frequency	Percentages
English	1,007	96
Chinese	46	4
Total	1,053	100

The number of students from Chinese medium schools was very small compared to that from the English medium schools. This was not surprising as the overwhelming majority of schools in Hong Kong still used English as the teaching medium at the time the study was conducted.

The Word Levels Test

The main instrument used to find out the vocabulary knowledge of the students under study is similar to the Word Levels Test (Nation, 1990) which contains five levels, each of which includes samples of words at five frequency levels: 2,000-word level, 3,000-word level, university word level, 5,000-word level and 10,000-word level. The 2,000 and 3,000 levels contain high frequency words, the university word level represents one kind of specialized vocabulary, the 5,000 level is on the boundary of high- and low-frequency words while the 10,000 level contains low-frequency words. Read (1988) explains that these words "were selected on the basis of the frequency data in Thorndike and Lorge (1944), with cross-checking against the General Service List (for the 2,000-word level) and Kucera and Francis (1967). The one exception was the university word level, for which the specialized count of Campion and Elley (1971) was used. (This excluded the first 5,000 word of Thorndike and Lorge)" (p. 17). Read further comments that the test is "the first attempt to undertake diagnostic testing of vocabulary knowledge, including both general and academic vocabulary" (p. 17). Indeed, as stated in Nation (1990), the aim of the test is "to decide where learners should be given help with vocabulary learning" (p. 79), which matches the aim of the present study.

The Test uses a word-definition matching format. Students are required to match 6 words to 3 definitions. There are 36 words and 18 definitions at each level (Nation, 1990, p. 264-272). Read (1988) remarks that "this slightly unconventional format was developed with the aim of having an efficient testing procedure that involved as little reading as possible and minimized the chances of guessing correctly" (p. 17).

The Word Levels Test used for the present study is a much longer version provided by Nation himself, including 144 words and 72 definitions at each of the five word levels, four times as long as the one in Nation (1983; 1990). So, a total of 720 words can be tested. This large sample size is of utmost importance to the study as the results are more reliable (Nation, 1990). Also, although the word-definition matching format requires additional time for reading when the test is being completed, it is not as time-consuming as other vocabulary tests which involve testing words in contexts or eliciting data through interviews. What's more important is that the answers are easy to mark and students' knowledge of the words can be verified.

Despite all the above strengths, it should be admitted that the Word Levels Test is a test for receptive or passive vocabulary only. Nevertheless,

taking into account the overall aims of the study, the potential problems in measuring free active vocabulary and the way the data were collected for the study, it was considered more appropriate to adopt the long version of Nation's Word Levels Test.

Procedures

The vocabulary test and a vocabulary learning strategies questionnaire were mailed to the 5,000 students reported earlier together with a stamped return envelope enclosed. The purpose and findings of the questionnaire will be reported in a separate paper and will not be dealt with here. In the letter the aim of the vocabulary project was explained to the students, who had to sign an Agreement if they decided to take part in the study. They undertook to do the test in a place where they could concentrate on their work, finish their work within the time specified (45 minutes to one hour), and work entirely on their own. They were requested not to use any dictionaries, discuss with anybody, or get help from any other sources; they were also told that they should send back the completed work by post using the return envelope within three days upon receipt of the letter. The return rate was 20.08%, which was slightly higher than expected.

Analysis

The split half technique was first used to check the reliability of the Word Levels Test, the results of which were obtained by calculating the average mean scores and percentages of known words at each level. The independent sample *t*-tests were used to find out whether there were any significant differences in vocabulary scores between the English and Chinese medium students in the study. Correlation analysis was conducted to investigate relationships between the HKALE results and the overall vocabulary test scores and between test scores at the five word levels. *F*-test and Bonferroni Multiple tests were also employed to decide whether there were any significant differences in the test scores among the A to E grade students at each of the 5 word levels and overall.

Findings

Results of the Word Levels Tests

Before the test results were analysed, the First-half Last-half split method was used to check the reliability of the Word Levels Test. The Spearman-Brown formula provided the following coefficients:

Table 3 Reliability of the Word Levels Test ($p < 0.000$)

Word Levels	Coefficients
2,000	0.7208
3,000	0.8516
UWL*	0.8453
5,000	0.8523
10,000	0.8457

* University Word List

The coefficients at all the five levels indicated the high reliability of the test, which was expected, as there are as many as 72 items at each word level in the test. Results of the Word Levels Test are reported in Table 4 below.

Table 4 Overall Results of the Vocabulary Levels Test (Maximum Score = 72)

Word Levels	Mean Scores	SD	Percentages of Known Words
2,000	68.34	3.39	95
3,000	61.54	7.51	86
UWL	60.30	7.47	84
5,000	49.14	10.42	68
10,000	25.98	9.96	36

Table 4 presents the average mean score for each of the 5 word levels in the Vocabulary Test. It shows a very clear pattern of declining scores across 2,000, 3,000, 5,000 and 10,000 frequency levels with the scores at 3,000 and UWL levels close to each other, an obvious drop at the 5,000 word level and a more drastic one at the 10,000 word level.

Before the vocabulary knowledge of the students under study is assessed, it is important to know how the Word Levels Test should be interpreted. Referring to the short version of the test, Nation (1990) states that "if someone scores 12 or less out of 18 in a section of the test, then it is worth helping that learner study the vocabulary at that level" as this score "indicates that approximately one-third of the words at that level are not known. Thus, there will be at least 200 to 300 words worth studying at that level" (p. 262). That is to say, a learner has to know at least more than two-thirds or 67% of the words at each level or the student will need help.

Based on these criteria, the group as a whole performed quite well in the Test. The column on Percentages of Known Words in Table 4 shows,

for example, that they knew 95% of the words at the 2,000 level indicating that they were credited with the knowledge of 950 of the words at the 2,000 word level (which contains 1,000 words). Applying the same interpretation to the results of the other 4 word levels, it seemed that students under study did not need help with vocabulary at the 2,000, 3,000 and UWL levels. As Nation has commented, "most of the 2nd, 3rd and UWL is known. In terms of high frequency and academic vocabulary, the learners are very well off. There will still be plenty of unknown words for them in their texts, but the respectable scores on the 5,000 and 10,000 levels indicate that they will probably not face severe vocabulary problems" (personal communication, August, 1999).

It might be somewhat surprising to note that the average mean score for the UWL was as high as that of the 3,000 word levels. This, however, can be explained by the fact that as 96% of the students under study were from English medium schools, they were exposed to a lot of academic vocabulary in the two-year Matriculation course, and they had learnt/acquired a considerable amount of academic vocabulary consciously or subconsciously. The English text books they used and the English handouts supplied by their teachers, for example, were very important sources of academic vocabulary.

Relationship between Test Scores at the UWL and the Other Word Levels

In order to find out more about the relationship between test scores at the five word levels, a correlation analysis was conducted. All the correlations reported below were positive and significant.

In general, there was a relatively strong correlation between the 2,000 and 3,000, the 3,000 and 5,000, and the 5,000 and 10,000 word levels indicating a close relationship between knowledge of words at these levels. The relatively low correlation between test scores at the 2,000 and those at the 5,000 and particularly the 10,000 word levels suggested that the students proficient in the vocabulary at the 2,000 level might not be proficient in words at the other two levels, which is understandable. For the lower correlation between the 10,000 and other word levels, Nation considers it "a sampling problem of the test. It is very difficult to predict learners' vocabulary-beyond-about-5,000 words" (personal communication, August, 1999).

lower than those of the A, B, C, and D grade students at all the 5 levels. Similarly, the test scores of D grade students were significantly lower than those of the A, B, and C grade students at all levels. The test scores of the C grade students were also found to be significantly lower than those of the A and B grade students at all levels except the 2,000 one. On the other hand, no significant differences were found between the test scores of the A and B grade students at any of the five word levels, suggesting that these two groups of students were rather close in terms of vocabulary proficiency.

Vocabulary Test Results of the Chinese and English Medium Students

When the performance of students from the Chinese and English medium schools were examined separately, the test results of the English medium students were found to be much better than those of the Chinese medium students as shown in the following table.

Table 7 Vocabulary Test Scores Score of Students from English and Chinese Medium Schools. (Figures in brackets indicate percentages of known words at each word level.)

	2,000	3,000	UWL	5,000	10,000	Total
English (<i>N</i> = 1007)	68.53 (95)	61.79 (86)	60.86 (85)	49.60 (69)	26.30 (37)	276.11
Chinese (<i>N</i> = 46)	64.35 (89)	52.59 (73)	48.78 (68)	40.50 (56)	19.65 (29)	225.87

Table 7 shows that the test scores of the English medium students were higher than those of the Chinese medium students in all aspects. Although the number of Chinese medium students was small by comparison, having examined the variances of the two samples, it was considered appropriate to use independent sample *t*-tests to find out whether there were any significant differences between the two groups. Results showed that significant differences ($p = 0.05$) were found between the two groups regarding their test scores at all levels and overall. The greatest difference between the two groups was found at the UWL level, a difference of 17%, which was followed by the 3,000 and 5,000 word levels, both of which reported a considerable difference of 13%. These findings were consistent with the findings reported earlier that there were close correlations between

scores for the UWL level and those at the 3,000 and 5,000 levels. The differences regarding the 2,000 and 10,000 levels were relatively small, 6% and 8% respectively.

Discussion

This section will first comment on the validity of the Word Levels Test and the reliability of the data collected for the study before focusing on the implications of the findings.

Reliability of the Word Levels Test/Test Scores

The long version of the Word Levels Test by Nation has proven to be a reliable vocabulary test as shown by the great coefficients in the Split Half technique. The reliability of the Test is further confirmed by the pattern of declining vocabulary test scores from the 2,000 to the 10,000 word levels justifying the division in the Test by level. The positive and significant correlation between the English results of the HKALE and the scores of the Word Levels Test also lends additional support to the validity and reliability of the Test.

Reliability of the Data in the Study

Although the students who took part in the study all signed an Agreement to do the test as instructed, they did not complete it under any supervision. This could have been a major threat to the reliability of the data collected. Nevertheless, the reliability of the data has been confirmed not only by the declining pattern of test scores from the high frequency to the low frequency word levels but also by the declining score pattern from A to E grade students.

Vocabulary Knowledge of Students and Their Needs

The overall results of the Word Levels Test have indicated that for most of the students who are admitted to the university, vocabulary will not be a major source of difficulty. However, it should be noted that the English proficiency of the students under study was slightly higher than that of the student population and their performance might be marginally better

accordingly. Results of the Word Levels Test also show that in general students have sufficient academic vocabulary for their study. These findings should also be interpreted based on the understanding that most of the students taking part in the study were from English medium schools and therefore had ample chances to use academic vocabulary.

Regarding the needs of the different categories of students, while the A and B grade students may consider enhancing their knowledge of words at the 10,000 word levels, the C grade students need to work harder on words at the 3,000, UWL and 5,000 levels as it was the test scores at these levels that distinguished them from the A and B students, irrespective of their good knowledge of words at the 2,000 word level. For the D and E grade students, in order to cope with their study in the university, they may need to work the hardest to increase their academic vocabulary. Nation (1990), discussing the results of the short version of the Word Levels Test, points out that if a learner intends doing academic study at a university, it is desirable for him/her to obtain a score of at least 15 out of 18. That is to say, university students should have the knowledge of at least 83% of the words at the UWL level. But evidence in the study has indicated that the D grade students know 84 percent and the E grades students know 76% of the words at this level. They may also need to improve simultaneously their knowledge of words at the 3,000 and 5,000 levels by reason that knowledge of words at these two levels have been found to be very closely related to that of the UWL level.

In the Hong Kong context; English teachers of Matriculation courses may focus more on the teaching of words at the 3,000 word level as students more proficient in words at this level have been found to perform better in the HKALE. On the other hand, university teachers may, based on the HKALE English results obtained by their students, easily identify and attend to their vocabulary needs when they first join the university. Since the D and E grade students are rather weak in academic vocabulary and these two groups of students combined constitute nearly 70% (D grade: 40% and E grade: 30%) of the students admitted to the university every year, EAP teachers may have to cater to their vocabulary needs first and foremost. The sheer scale of this task should not be underestimated.

Vocabulary Knowledge and Medium of Instruction

The relationship between teaching medium and vocabulary knowledge was too striking to be ignored. The performance of the English medium

students was superior to that of the Chinese medium students at all five word levels. What deserves our concern are the findings that the Chinese medium students have been found to have knowledge of only 67% of the words at the University Word Level, which is far from the minimum 83% required. These findings have crucial implications for the teaching of English in Hong Kong. As mentioned at the beginning of this paper, the medium of teaching in the majority of Hong Kong schools has been switched from English to Chinese since the academic year 1997/1998, a reverse of the situation when the present study was carried out. Although it is beyond doubt that students will benefit more from mother-tongue education, there may be the disadvantage of Chinese medium students becoming less proficient in English vocabulary when it comes to tertiary education. These problems need to be addressed as soon as possible. There should be a long term plan in Chinese medium schools to see to the vocabulary needs of their students, particularly the needs of those who intend to study at the university.

Conclusion

The Word Levels Test, as shown by the findings in the study, is a very useful indicator of both English proficiency and vocabulary knowledge despite the fact that only passive vocabulary is involved in the Test. In view of the strong and positive relationship between language proficiency and vocabulary test scores, it is obvious that vocabulary knowledge has a very essential role to play in the acquisition of L2 proficiency, although the relation between the two may be considered as a chicken and egg one. In order to raise the standard of English of Hong Kong students, it is suggested that course designers may consider incorporating vocabulary teaching into the English courses of both schools and universities. Also, future research focusing entirely on the academic vocabulary knowledge of students may consider using the Academic Word List (Coxhead, 1998) which has recently superseded Xue and Nation (1984) and Nation (1990), as reported in Read (2000).

References

- Anderson, R. C., & Freebody, P. (1983). Reading comprehension and the assessment and acquisition of word knowledge. In Hutson, B.A. (Ed.), *Advances in reading language research*. Vol. 2 (pp. 231-256). Greenwich, CT: JIA Press.

- Barber, R. A. H. (1999). *A study of the correlation between vocabulary knowledge and HKCEE results*. Unpublished MA dissertation, The Hong Kong Polytechnic University.
- Campion, M. E., & Elley, W. B. (1971). *An academic vocabulary list*. Wellington: NZCER.
- Cobb, T., & Horst, M. (2000). Vocabulary size of some City University students. [Online] Available at web-site <http://www.er.uqam.ca/nobel/r21270/cv/Citysize.html>
- Coxhead, A. (1998). *An academic word list*. English Language Institute Occasional Publication, No.18. Wellington: School of Linguistics and Applied Language Studies, Victoria University of Wellington.
- Kucera, H., & Francis, W. N. (1967). *A Computational analysis of present-day American English*. Providence, RI: Brown University Press.
- Laufer, B. (1995). Beyond 2000 — A measure of productive lexicon in a second language (1). In L. Embank, L. Selinker, & M. Sharwood-Smith (Eds.), *The current state of interlanguage* (pp. 265–272). Amsterdam: J. Benjamins.
- Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied Linguistics*, 16 (3), 307–322.
- Littlewood, W., & Liu, N. F. (1996). *Hong Kong students and their English*. Hong Kong: Macmillan Publishers.
- Meara, P. (1990). A note on passive vocabulary. *Second Language Research*, 6 (2), 150–154.
- Meara, P., & Buxton, B. (1987). An alternative to multiple choice vocabulary tests. *Language Testing*, 4, 142–54.
- Melka, F. (1997). Receptive vs. productive aspects of vocabulary. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary — Description, acquisition and pedagogy* (pp. 84–102). Cambridge: Cambridge University Press.
- Nation, I. S. P. (1983). Testing and teaching vocabulary. *Guideline*, 5, 12–25.
- Nation, I. S. P. (1990). *Teaching and learning vocabulary*. New York: Heinle and Heinle.
- Palmberg, R. (1987). Patterns of vocabulary development in foreign language learners. *Studies in Second Language Acquisition*, 9, 201–20.
- Read, J. (1988). Measuring the vocabulary knowledge of second language learners. *RELC Journal*, 19, 12–25.
- Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing*, 10, 355–71.
- Read, J. (2000). *Assessing vocabulary*. Cambridge: Cambridge University Press.
- Thorndike, E. & Lorge, I. (1944). *The teachers' word book of 30,000 words*. Columbia: Teachers College.
- Wesche, M., & Paribakht, T. S. (1996). Assessing second language vocabulary knowledge: Depth versus breadth. *The Canadian Modern Language Review*, 53, 13–40.
- Xue, G., & Nation, I. S. P. (1984). A university word list. *Language Learning and Communication*, 3, 215–229.

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