

Matching vocabulary learning process with learning outcome in L2 academic writing: an exploratory case study

This exploratory case study of two undergraduates links vocabulary learning approaches with lexical quality measured in academic writing. Employing an array of qualitative data, it is shown that in a “semi-language-rich” learning context, Chinese learners may dispense with rote learning and engage in a more natural learning approach in which vocabulary items are discovered from reading newspapers and consolidated in writing. A shift in language assessment is another key factor that contributes to this rarely reported learning approach among Chinese learners. Measuring lexical quality shows that the two students made impressive but differentiated lexical achievement. Underlying these findings is the two students’ highly explicit metacognitive awareness of the learning process in initiating, selecting and consolidating the vocabulary items to be learned in academic learning contexts.

Keywords: vocabulary learning, academic writing, metacognition, lexical quality, case study

1. Introduction

Traditionally, L2 vocabulary acquisition focuses on the learning process, i.e. documenting how vocabulary items are learned incidentally from reading or intentionally from list memorisation or explicit instruction. Another established approach to researching into the vocabulary learning process is to examine what learning strategies are self-reported by learners. A number of such studies have attempted to establish the link between the learning process and the learning outcome (Fan, 2003; Gu & Johnson, 1996; Gu 2003; Kojic-Sabo & Lightbown, 1999; Lawson & Hogben, 1996). However, when both are addressed, the outcome is often measured in terms of vocabulary size or general language proficiency. A growing body of studies has shown that lexical quality is tightly related to L2 writing quality (Engber, 1995; Laufer & Nation, 1995; Lee & Muncie, 2006; Baba, 2009), but no studies investigating both learning process and learning outcome have, to our knowledge, measured lexical use in free essay writing. Given the importance of academic writing in most programmes for undergraduate or postgraduate courses, it becomes urgent to examine how the vocabulary learning process accounts for lexical quality in academic writing.

This article begins with reviews of lexical studies that investigate learners' vocabulary strategy use, the aim being to show how learning process is related to learning outcome. A stereotypical image of Chinese learners (mainly non-language specialists) emerges from this review process. The importance of measuring lexical use in essay writing is then highlighted. This is followed by a case study of two high achieving Chinese students' vocabulary learning experience as well as their marked lexical achievement as measured in academic assignments. Both similarities and differences will be pinpointed with a view to showing how individual learning paths can account for their similar but nevertheless differentiated learning outcome. It is shown how the two learners' vocabulary learning accounts diverge from the stereotypical

image of Chinese learners; this different picture is deemed to be attributed to the nature of the learning environment and the shifting assessment formats.

2. Vocabulary learning strategies and vocabulary achievement

Most studies that investigate learners' vocabulary strategies have tried to discover how strategy use could contribute to vocabulary knowledge or general language proficiency, although this is not the sole focus of the studies. Findings generally show that different levels of vocabulary achievement are associated with combinations or clusters of strategies (Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Sanaoui, 1995), i.e. metacognitive regulation strategies such as the efforts made in initiating learning opportunities and selecting words (Gu & Johnson, 1996) as well as certain cognitive strategies involving the use of dictionaries or guessing (Fan, 2003). However, learning outcome in these studies is always measured in size tests, or in general English proficiency with commonly used test formats. For example, in Gu and Johnson's study (1996), learning outcome was measured in (1) vocabulary size and (2) general proficiency composed of discrete language skills: listening, reading, vocabulary, grammar and translation. Writing, a key factor in measuring lexical use, was excluded from the measures. One reason is that only non-English majors were included in the study. Non-English majors' proficiency is often measured in standardised tests where writing only counts for a small proportion. On the other hand, writing should be accorded much more importance for language majors or postgraduate students as their assignments frequently require essay submissions.

In a subsequent case study, Gu (2003) examined two high-achieving Chinese university students' vocabulary learning using think-aloud protocols in conjunction with interviews. One female student read extensively, and was hence a "reader," and the other male student employed a wide range of strategies, this making him an "active strategy user." The active strategy user exclusively focused on reading textbooks and treated most new

vocabulary items meticulously, noting down various lexical aspects for the new item: pronunciation, meaning, synonyms, usage and example sentences. Such careful learning was followed by memorisation, i.e. oral repetition till the word had been memorised; he used both self-made vocabulary lists and commercial ones. By contrast, the reader confessed to being a lover of English and was drawn to the beauty of the language. She read novels and other works of prose, deriving great pleasure from the emotions, sounds and images evoked from reading these works. Apart from extensive reading for pleasure, like the other student, she also made great efforts to memorise vocabulary lists, mainly commercial ones; she went through the lists alphabetically and tested herself on each word in turn.

3. Chinese students: bound to be rote learners?

Gu's study (2003) confirmed a stereotype of Chinese learners, namely, that, regardless of being good or poor learners, they relied heavily, if not exclusively, on rote. Gan, et al. (2004) also came to the conclusion that both successful and unsuccessful learners regarded rote learning as the most valuable strategy, though the former would make efforts to consolidate the memorised vocabulary whereas the latter would not. While these studies involved only non-language majors, that of Ding (2007) constructed the same image of rote learners among elite English majors in China, who regarded text memorisation and imitation as the most efficient way to learn English. Chinese students' rote learning style is assumed to be heavily influenced by Confucianism (Watkins & Briggs, 1996; Marton et al., 1996; Hu, 2002). Author (2011) provides more contextualised explanations for Chinese learners' rote learning style: (1) the culture of learning; (2) vocabulary learning difficulties; (3) the exam-centred Chinese education system; (4) profitable commercial vocabulary lists which encourage Chinese learners' rote learning style. Recent studies show that strategy use is not necessarily culture-bound but may be context or situation-dependent; such contextual mediating factors are complex and dynamic, including instructional pedagogy, language proficiency (Cheng, 2000),

language policy (Hu, 2003), learning experience at home and abroad (Gao, 2006), and historical perspectives (Jiang & Xiao, 2009). Immersed in the L2 countries (UK, USA, Canada or Australia) or a comparatively rich language-input environment (such as Hong Kong or Singapore), students can learn outside, as well as inside, the classroom, by communicating in the target language. More importantly, writing academic assignments for courses pushes them to think and organise ideas in the L2; they thus engage in a high level of cognitive processing, which would allow them to maximise their language use. Given such a fast changing scene in the language learning context, it is necessary to construct an updated account of how Chinese learners learn L2 vocabulary in a different context rather than adhere to the traditional stereotype.

4. Lexical use in L2 writing

Along with the growing interest in vocabulary, lexical use has been shown to be crucial in developing various language abilities, including L2 writing. Vocabulary is now considered one of the most important indicators of the overall quality of L2 writing (Laufer, 1994; Engber, 1995; Lee & Muncie, 2006; Baba, 2009). Laufer and Nation (1995) put it this way: “A well-written composition, among other things, makes effective use of vocabulary. This need not be reflected in a rich vocabulary, but a well-used rich vocabulary is likely to have a positive effect on the reader.” (p. 307). The literature on L2 vocabulary frequently distinguishes two types of knowledge, i.e. size and depth. Vocabulary size or breadth refers to the number of words of which at least some aspects of the meaning the learner knows (Anderson & Freebody, 1981). Passive or meaning recognition tests are frequently used to measure vocabulary size (Author, 2009; Milton, 2009). Depth refers to the more qualitative aspects of word meanings and use as measured in Read’s (1993; 1998) Word Associates Test. Words produced in L2 writing can be measured in terms of size, the range of vocabulary at different frequency levels, as well as depth, i.e. lexical quality, which is frequently equated

with lexical richness. Common measures of lexical richness include lexical variation, density, sophistication and error rate (Read, 2000). *Lexical variation* refers to the type/token ratio (TTR); *lexical density* is the ratio between the number of lexical words and the total number of words; *lexical sophistication* is the ratio between the number of infrequent words and the total number of words; *lexical error rate* is the ratio between the total number of errors and the total number of word tokens. However, not all of these indices have been shown to be equally related to writing quality. Engber (1995) employed timed compositions (around 300 tokens) as part of a language test in order to examine the relationship between lexical richness and overall rating scores of L2 writing. Fairly high significant correlations were found between the overall rating scores and the lexical variation with error (.45) or without error (.57), and the lexical error rate (-.43), but no significant correlation was found between the overall rating and the lexical density. Engber's study suggests that having a wide range of vocabulary as well as being able to use these items accurately are two key factors in determining high writing quality.

Laufer and Nation (1995) proposed an alternative measure of lexical richness – Lexical Frequency Profile (LFP). A computer program screens the input texts and measures the range of learners' productive vocabulary divided into four frequency levels: the first 1000 words (K1), the second 1000 words (K2), the University Word List (UWL) and the off-list words (OL) not in any of the previous three lists. Using LFP, they investigated three different proficiency groups' lexical use in short compositions produced during class time. The results showed that the three proficiency groups demonstrated significant differences in K1, UWL and OL, but not K2. A productive vocabulary test yielded good correlations (ranging from .6 to .8) with OL and with UWL, and negative correlations with K1 (-.7). This suggests that more proficient learners tend to use more vocabulary in the UWL and OL but less at the most basic K1 level.

Using a modified version of LFP, Morris and Cobb (2004) presented a program called Vocabprofiler, providing lexical percentages for K1, K2, AWL (the Academic Word List, developed by Coxhead, 2000) and OL. They used Vocabprofiler to examine the relationship between learners' lexical knowledge in essay writing and their subsequent academic grades in a grammar course. The two authors argued for a strong connection between use of AWL and academic success in tertiary education; they claimed that language skills, particularly lexical skills, are related to "higher level thinking skills that university students and future teachers need to be successful" (Morris & Cobb, 2004, p. 78). The correlation obtained between the course grades and the AWL and K1 were moderate but yet significant (.37 and -.34 respectively). These studies indicated that making use of academic words, as well as showing a wide range of vocabulary beyond K1 in academic writing, are associated with academic success.

All the studies cited above employed timed essays in a testing or similar environment. Studies by Kenworthy (2006) and Muncie (2002) have shown that learners' lexical features behave differently in timed essays and at-home essays. As a corollary, these timed essays were quite short, around 300-500 words. Measuring learners' lexical use in free at-home longer essays is called for.

5. The current study

To date, there is no record of any study that looks into the relationship between learning process and learning outcome as measured in terms of productive knowledge in free L2 academic writing. In learning environments such as Hong Kong universities where English is used as the medium of instruction and most courses require essay submission, measuring learners' lexical use in academic writing would make much more sense than simply administering passive vocabulary tests such as the size test. It would also be meaningful to look into learners' vocabulary learning process by identifying the key features

or strategy use related to the learning outcome. Linking vocabulary learning process with lexical quality in academic writing could inform both learners and teachers of the key actions or pedagogy to improve the quality of academic writing. In addition, fathoming how the learning process contributes to the learning outcome for successful L2 Chinese learners in underreported contexts will lead to a deeper understanding of by far the largest world-wide legion of English learners.

This study focuses on two high-achieving students who were enrolled in a Bachelor of Education programme, while studying for a degree in English Language, in a Hong Kong tertiary institution. Efforts were made to document both their learning process, i.e. accounts of learning experiences in terms of strategy use, and learning outcome, i.e. the lexical quality as measured by two lexical indices of two academic essays: lexical profiles (size of productive vocabulary measured at different frequency levels) and lexical variation (TTR). The first was considered by Laufer and Nation (1995) as one important measure for lexical richness in writing and the second placed at the top among the four essential features for lexical richness constructed by Read (2000). Of these four measures, it is lexical variation, or TTR, that has been widely employed in studies that investigate lexical use in written or oral language (Vermeer, 2000; Jarvis, 2002; Lemmouh, 2008). The other three, i.e. lexical sophistication, density and error rate, will not be reported due to the limited space and their relatively less frequent occurrence in empirical studies. There are two research questions that guide this exploratory study:

1. How do the two students approach vocabulary learning at the tertiary level?
2. What are their lexical profile and lexical variation as measured in their academic writing?

A case study approach is adopted in this study for several reasons. First, case studies have a long history documenting learners' language learning process. Second, the current study is exploratory in nature and a case study can fulfil this purpose (Yin, 2003). Thirdly, many quantitative studies have been conducted to investigate either learners' vocabulary learning process or their lexical quality separately, but findings do not shed light on the interconnections between the two. Thus, a small-scale qualitative study is needed prior to a larger scale investigation. Data are collected from multiple sources: questionnaire, interview, vocabulary notebooks, self-reflections revealed in email correspondence, and academic assignments, which is in line with Yin's (2009) claim that using multiple sources of data is to ensure data triangulation; multiple sources of evidence are "highly complementary" (p. 101) and could "corroborate and augment evidence from other sources" (p. 103).

5.1. Participants

Two high-achieving students, K and A, in the English Department of a tertiary institute in Hong Kong were chosen from 110 fourth year students to participate in the present study.; They were placed in first and third position upon graduation in their cohort, both receiving a first class Honours, with a GPA higher than 3.4.

5.2. Data collection and analysis

5.2.1. Learning process

A self-designed vocabulary learning strategy questionnaire based on previous research (Fan, 2003; Gu & Johnson, 1996; Schmitt, 1997) was given to the two students; this was followed by a semi-structured interview aimed at probing deeply into K's and A's vocabulary learning process. The interview questions were organised based on the three learning stages as identified in Gu's (2003) study: how learners discover new words and their initial handling of

these words, how they commit the words to memory and how they make use of the words. The interview was conducted in English as the researcher is not fluent in Cantonese and K and A are both fluent in English. During the interview, it was discovered that both A and K had the habit of keeping vocabulary notebooks. After the interview, they agreed to submit their vocabulary notebooks as additional evidence for their vocabulary learning. After reading through the transcripts and studying the vocabulary notebooks, the researcher sent follow-up emails to K and A, requesting more detailed information regarding their vocabulary learning approaches as a way of self-reflection which unveiled their motivation and purposes of their strategy choice. Since the self-report questionnaire contained only Likert-type questions and what was revealed from the questionnaire was consistent with the findings from the interview, only the qualitative data from the interview, the vocabulary notebooks and email correspondence will be reported later. The data analysis went through a two-stage process: initial coding and categorising types in order to “identify key features and relationships in the data” (Richards, 2003, p. 273). Emerging themes that resulted from initial coding were merged to produce patterns in the data by techniques as informed by Grounded Theory developed by Strauss and Corbin (1998).

5.2.2. *Learning outcome*

In order to measure their lexical achievement, each student submitted two essays they had written as assignments for two common courses they took in the previous semester. One essay was about how to deal with learning diversity (or students with learning disabilities) in the classroom and the other was a discussion of Henrik Ibsen’s plays. Thus the essays were on two markedly different topics: *special education* and *drama*. Further, a length of 3000 words was specified for the first essay and 1500 words for the second. The essays were put into the program “Range” developed by Paul Nation (available at http://www.victoria.ac.nz/lals/staff/Publications/paulnation/Range_GSL_AWL.zip); it is an

updated version of the LFP discussed in Laufer and Nation (1995). This tool was used to analyse the lexical features of the text and display a number of indices such as the proportion of 1K, 2K, AWL and OL. So far, there are no established standards or a threshold level of proportion for each of these four frequency levels for academic writing. A few studies have alluded to some important indices regarding learners' lexical profiles, one being the study by Laufer and Nation (1995), which suggested that more proficient learners use more words in the AWL and the off-list words. For example, the most proficient group (second year Israeli English majors) achieved a range of 8.1% - 10.1% and 7.5% - 8.7% at these two levels respectively. By correlating profile scores with academic grades, Morris and Cobb (2004, p. 83) arrived at a "fairly modest writing standard" for vocabulary profile: $K1 < 85\%$; $AWL > 5\%$. But the essays were completed by only first year TESL students of mixed L1-background (English, French, Italian, Greek, etc.). In addition, these indices were obtained from texts of around 300 words in length. It would be difficult to employ these indices as standards as other factors may come into play: differing proficiency levels, varying L1 backgrounds and fixed text length.

In order to overcome the lack of any standard score to evaluate K's and A's lexical profile, two academic essays written by well educated native speakers on similar topics and of similar length were chosen. By using key words and searching in relevant journals, two articles were selected from two different international journals, one related to special education and the other to drama which also discusses Ibsen's plays. The author information provided on the title page shows that both authors were native speakers of English and were working at universities in English-speaking countries. Lexical variation or type/token ratio (TTR) was measured in WordSmith (version 5).

6. Results

In this section, qualitative findings are described under "learning process" while the analysis

of the students' two essays are compared with scholarly equivalents quantitatively under "learning outcome."

6.1. Learning process

6.1.1. Similarities

Two patterns were generated for both students' vocabulary learning process, one reflecting the similarities and the other the differences. A clear and similar path of vocabulary learning emerged for K and A: both students regarded English newspapers as the primary source to encounter new vocabulary items; they would put down important words in a notebook; they considered using newly learned words directly to be the most effective means to retain these words in memory. Reading newspapers was frequently mentioned during the interview and both said they read a newspaper almost every day, usually the South China Morning Post. This was confirmed by the vocabulary notebooks and additional learning evidence provided by the two students. A's vocabulary notebooks comprised essentially pasted news cuttings; unknown words in each text were marked (underlined or circled) and annotated (mostly in English and occasionally in Chinese). As for K, his vocabulary notebook was a classic one, composed of lists of lexical words or phrases, but he also supplied a number of text cuttings from newspapers and in subsequent email correspondence explained why he kept news cuttings:

I always think the usage of English in newspaper is very helpful as it reflects a common practice and usage of English in the real world so a study of it can definitely help to improve my mastering of the language. (K-email)

Newspapers were not only a source for them to discover new words but also provided good opportunities for them to consolidate newly learned words:

Uh, yes, particularly my source of new words is mainly from newspapers, so I think they are quite frequently used in the newspaper as well, so once I go into the newspaper again, I will catch the newly encountered words and I know the meaning now so I can read it smoothly. (K-interview)

Both mentioned that academic lectures could provide a source for vocabulary learning, but it was their impression that they did not find new vocabulary items very often from academic lectures. Lecturers would usually explain those important academic words and four years of exposure to academic lectures and readings have consolidated their mastery of the academic vocabulary; this has been particularly the case for A, as will be shown later. Frequent contacts with academic vocabulary encouraged a rather unconscious “acquisition” process instead of a conscious “learning process”.

After finishing reading the whole newspaper, both K and A would note down important or interesting words, together with the Chinese meaning and sometimes an example sentence or synonym. Both would review the words in their notebook but not on a regular basis. K explained later in email correspondence his metacognitive strategy:

My belief is that when this is the new knowledge, keeping it in the notebook can refresh my mind on that and help me to be familiar with its application. But if I keep on doing that after some time, I may develop a tendency to rely too much on it without the confidence of using it freely. Therefore, after some time, the notebook will no longer be referred to. (K-email)

Regarding the most effective means for them to memorise vocabulary, both affirmed it was by using newly learned vocabulary in writing or speaking. Although K had tried to use different memory strategies, he claimed that those memory strategies were “not as useful as directly using it [the new word]”. A said he used some memory strategies in the past (primary or secondary school) but not now. When it comes to how they used newly learned words, both K and A would prefer to use words in writing rather than speaking as they said: “we tend to

use simple vocabulary” in oral English.

6.1.2. Differences

Though it appears that K and A were similar in many ways regarding their vocabulary learning approaches, the data also disclosed a number of noticeable differences between them. First, K reported to have occasionally used a number of memory strategies though he did not think these strategies were more helpful than using the words directly. For example, he reported dividing words into syllables, grouping words according to the word class, using actions to help to remember the meaning of words or phrases. By contrast, A only reported using rhyming or similar sounds for memorising words on a few occasions, without mention of any other memory strategies. Second, A was more systematic and strategic in managing his learning than K. For example, A collected news cutting once a week; this habit was formed when he was a Form 4 student in the secondary school and attributed to his teacher’s advice. A also showed the strategic efforts he made in dealing with the news so as to achieve maximum benefit from learning vocabulary items:

Sometimes, I would listen to the Chinese version of a piece of news on TV and then find the corresponding/relevant news in the newspaper, so I didn't need to spend time on understanding the context but on vocabulary and sentence structures. (A-email)

Thirdly, although both A and K kept vocabulary notebooks, the way in which A arranged his news cuttings and vocabulary items shows that there is a qualitative difference in the two’s approaches: A arranged news cuttings and relevant vocabulary items in themes; he divided all news cuttings according to five themes in his notebook: *education*, *environment*, *health*, *comics* (short dialogues accompanied with pictures) and *miscellaneous* (sports, music,

entertainment, etc.). By contrast, K simply jotted down items alphabetically.

Finally, K and A preferred to use words in different written registers: written conversations (emails) for K and formal writing (academic assignments) for A who stressed the deliberate efforts he made to expand his range of vocabulary in writing academic assignments:

When I try to use [newly learned vocabulary], it's mostly, I think, in writing, and perhaps now sometimes when I put down my understanding of my argument in a sentence, in an assignment, sometimes I'd try to ask myself 'Can I use another word to substitute, or write or use this word, or can I use another one?' and like that. (A-interview)

6.2. *Learning outcome*

6.2.1. Lexical profiles

The student essays were edited before being put into the Range program. Different types of information were removed from the essays: (1) title page, (2) proper nouns, (2) abbreviated forms, (3) direct citation with question marks and (5) references. The articles written by the two native speakers went through the same procedure of editing. After such careful editing, it is fair to say that what remained to be compared could truly reflect the lexical repertoire of all the four authors in their writing. Each essay/article was put into Range separately. Range is similar to LPF or VocabProfile, showing the four frequency levels of the text input: the first and second 1000 word families (K1 and K2), the AWL and OL. Table 1 shows the general information pertaining to K's and A's essays after editing.

Table 1: General information pertaining to students' essays after editing

	K		A	
	Special education	Drama	Special education	Drama
Token	2796	1339	3090	1488
Type	746	408	909	564

A wrote longer essays than K in terms of tokens and this remained unchanged after editing when both token and type were taken into consideration. In order to establish the standards to which the students' lexical profiles could be compared, Table 2 provides lexical profiles of the two native authors at the four frequency levels.

Table 2: Lexical profiles of native authors' articles (in token and type)

Word List	Special education (Native 1)		Drama (Native 2)	
	Token / %	Type / %	Token / %	Type / %
K1	2258 / 72.63	410 / 52.36	1155 / 78.31	351 / 55.45
K2	240 / 7.72	73 / 9.32	71 / 4.81	61 / 9.64
AWL	361 / 11.61	155 / 19.80	91 / 6.17	79 / 12.48
OL	250 / 8.04	145 / 18.52	158 / 10.71	142 / 22.43
Total	3109	783	1475	633

Table 2 shows that if tokens are counted, both articles relied predominantly on the first two levels (K1 + K2), which accounted for more than 80% in both cases. The two remaining more sophisticated levels account for less than 20% in both cases. However, when types are counted, the distribution of the four frequency levels shows a notable difference. There is a

decrease of at least 20% for both articles in K1 and a substantial increase in AWL and OL, boosting the combined two more sophisticated levels to more than 30%. Although the table shows that the running words (tokens) in special education are twice as many as those for drama (3190 vs. 1475), the difference in word type is much smaller with only a difference of 150 words. This indicates that there tends to be a considerable repetition of words in longer texts. Given that we are only interested in the productive size of authors, counting word types would be more appropriate than counting word tokens. For this reason, the analysis will be presented in word types in the ensuing sections.

When the native authors' lexical profiles are examined for types, some differences are observed due to the genre of the two articles. Overall, while the two articles remain similar at the K1 and K2 levels (61.12% and 65.09% respectively), the one in special education used a considerably higher proportion of words in AWL (19.80% vs. 12.48%) and a lower proportion in OL (18.52% vs. 22.43%) than in drama. These differences could be attributed to the genre differences in the two articles. It is expected that this trend would be maintained in the essays produced by the two student authors if they were to have had a similar lexical achievement to that of the two native authors.

Table 3 presents the students' lexical profiles together with the native authors' profiles for reader's convenience. At the more basic levels, i.e. K1 combined with K2, A's essays range from 66.12% to 69.51%, similar to the combined K1 and K2 percentages for the two native authors (61.12% and 65.09%). At the more sophisticated levels, A achieved 19.69% and 13.83% in AWL in special education and drama respectively. This indicates that A's essays have shown a similar if not identical trend at AWL level to that of the native authors' essays: a higher proportion of AWL and a lower proportion of OL in special education than in drama. The actual percentages of these two levels are also quite close to those of the native authors (19.80% and 12.48%). This demonstrates that A has achieved a fairly satisfactory

command of academic vocabulary in terms of productive size, almost comparable to that of native authors. By contrast, A's percentages in OL (14.19% in special education and 16.67 in drama) are less satisfactory when compared to those of the native authors (18.52% in special education and 22.43% in drama).

We will now turn to K's lexical profiles. The two combined proportions at the basic levels (K1 and K2) were 73.59% and 82.35% in the two essays respectively, which was considerably higher than those of the two native authors and that of A. K's percentages for AWL were 16.22% in special education and 10.78% in drama, this being considerably lower than the native authors' range as well as A's. Regarding OL, the percentages were 10.19% in special education and 6.86% in drama, this too being much lower than those of the native authors and A's. Apart from these notable differences, K, unlike the two native authors and the other student author, has only demonstrated a greater proportion of AWL in special education but not of OL in drama. On the other hand, when compared with the standards set by Morris and Cobb (2003), i.e. $K1 < 85\%$ and $AWL > 5\%$, K's lexical profile should be considered quite satisfactory, his lexical indices being far above these two levels.

Table 3: Lexical profiles of both student and native authors (in type only)

Word List	Special education			Drama		
	Native 1 (type / %)	K (type / %)	A (type / %)	Native 2 (type / %)	K (type / %)	A (type / %)
K1	410 / 52.36	460 / 61.66	525 / 57.76	351 / 55.45	294/72.06	339 / 60.11
K2	73 / 9.32	89 / 11.93	76 / 8.36	61 / 9.64	42 / 10.29	53 / 9.40
AWL	155 / 19.80	121 / 16.22	179 / 19.69	79 / 12.48	44 / 10.78	78 / 13.83
OL	145 / 18.52	76 / 10.19	129 / 14.19	142 / 22.43	28 / 6.86	94 / 16.67
Total in type	783	746	909	633	408	564

6.2.2. *Type/token ratio (TTR)*

Researchers frequently remind us that TTR suffers in longer texts, i.e. the longer the text, the lower the TTR. In this study, all student essays and native authors' articles were divided into segments of 300 words and the TTR based on each segment was calculated. Finally, a general mean was obtained, resulting in the Mean Standardised TTR (MSTTR), calculated using WordSmith version 5. See Table 4 for the TTR and MSTTR of all authors.

Table 4: TTR and STTR of native and student authors

	Special education			Drama		
	Native 1	K	A	Native 2	K	A
TTR	24.35	26.67	29.01	42.47	30.32	37.89
MSTTR	51.30	53.59	55.87	58	48.33	56.92

The table shows clearly that TTR is considerably lower for longer texts on special education (almost twice as long as drama). The MSTTR shows less deviation across the two different genres than the non-standardised TTR. Not surprisingly, the table also shows that the drama texts tend to show higher MSTTR than in special education (except K's drama essay) as writing in social science requires language to be precise, accurate and technical. On the other hand, using a wide range of lexis may be a key feature in quality writing in the humanities. This is evident in the two native authors' articles (51.30 in special education and 58 in drama). It should be noted that the MSTTR of the student essays on special education (K: 53.59; A: 55.87) has greatly exceeded that of the native author. This, on the one hand, suggests the two students used considerably varied lexis compared with the native author. On the other hand, such varied lexis may not be always desirable in writing in social science. Perhaps what matters more is to use relevant academic or technical vocabulary in an accurate and appropriate manner.

7. Discussion

The results delineated the two students' vocabulary learning paths measured by an array of qualitative data: retrospective interview, notebooks and self-reflections. Their learning outcomes were measured by two indices, lexical profiles and variation, in academic writing. Although measuring the learning outcome in essay writing is not a novel idea, the current study differs from previous studies in two prominent ways. First, much longer academic essays, instead of timed short essays were examined. Second, essays were provided by more advanced learners (high-achieving English majors) instead of low-intermediate learners who often make mistakes that render the text incomprehensible. Putting things together, a number of themes emerge that are worth further discussion.

7.1. *Updated account of Chinese learners' vocabulary learning approaches*

The literature has constantly portrayed Chinese L2 learners to be rote learners regardless of their learning styles, strategies, motivation or achievement (Gu, 2003; Gan, et al., 2004); this image remains unchanged in the general context of learning and testing (Marton et al., 1996; Tang & Biggs, 1996). Central to all these studies is the concept of "memorisation" employed by Chinese learners, though it does not necessarily equate with mindless repetition. Some argue that Chinese learners' memorisation is associated with mental activeness or open-mindedness (Hu, 2002; Watkins & Biggs, 2001), thus leading to a deeper understanding of the information to be retained (Marton et al., 1996). The current study shows this is not necessarily true for Chinese learners of an L2 in Hong Kong. Both students took a natural approach to vocabulary learning, namely, *noticing new vocabulary from reading newspapers, noting down new items, practising using the items in writing*. What is clearly lacking in this process is reliance on deliberate efforts made to commit the items to memory, either in mechanical repetition or more elaborated techniques such as mnemonics. There are several

reasons which may explain the different learning approaches these two students adopted.

First, they were studying in a “semi-language-rich” environment. As Hong Kong is a former colony of Britain, English is one of the official languages and plays a key role in education, especially at the tertiary levels. However, unlike Singapore, where English is spoken in many sectors of the society as a national language, English in Hong Kong remains the language to be spoken with a relatively small number of English-speaking or other L1 expatriates or on limited occasions among local Chinese when non-Chinese are present. Hong Kong is largely a Cantonese-speaking society. Thus “semi-language-rich” is the label for this specific language learning environment. Compared with their counterparts on the Chinese mainland, the two students had been undoubtedly exposed much more frequently to English. In a study that investigates students’ vocabulary learning beliefs (Gao & Ma, 2011), both mainland Chinese and Hong Kong students perceived Hong Kong to be a language learning site that is much richer in learning resources and provides many more opportunities for using the language than in mainland China.

Second, the two students’ major learning strategy, i.e. using words directly in writing instead of relying on memory strategies, is related to the major assessment formats of their tertiary education. In previous studies, learners’ heavy reliance on memory strategies for retaining vocabulary is frequently associated with examinations where vocabulary is assessed in multiple-choice questions or more contextualised formats such as gap filling or translation. However, in the case of K and A, when longer academic take-home assignments were mostly required, they simply needed to put newly learned words into use by completing the written assignments rather than memorise them by heart to cope with examinations, which is not the case anymore. Thus, the change of assessment from language testing to essay submissions is the key factor that changed A and K’s learning approaches; they both reported they had used memory strategies quite a lot in secondary school when they needed to face high-stakes

examinations. This provides further evidence that contextual factors may play a key role in mediating learners' strategy use (Gao, 2006). Using words is perhaps the best way to consolidate words met previously: it forces the learners to pay attention to various aspects, such as meaning, spelling, part of speech, grammatical constraints, collocations, etc. All these types of lexical information can be integrated into a lexical item when the learner attempts to use it in writing.

7.2. *Learning approaches and the learning outcome*

The results suggest that there is a connection between the approaches to vocabulary learning and the two students' lexical achievement. Overall, K and A took a similar, but not identical learning approach. Though both have achieved overall satisfactory lexical profiles and MSTTR, A's lexical achievement was superior to K's in a number of different ways, as reported above. Although many other factors can play a role, the differences in their learning approaches can partially explain their differentiated learning outcome. Firstly, K preferred to use newly learned words in informal email writing. Unlike K, A favoured practising newly learned words in formal academic writing. A also showed a higher metacognitive awareness in making deliberate efforts to substitute words of similar meaning in writing. All of this may suggest that A is likely to pay more attention to academic vocabulary which is required less in daily email writing; the analysis of his essays showed this is indeed the case: his proportion of AWL was almost as good as that of the other two native authors in writing on two markedly different genres whereas there was a fairly large gap between K and the native authors in terms of AWL. Secondly, though both reported that they read English newspapers almost every day, A was more strategic in processing news and systematic in noting down new lexical items as evidenced in the two notebooks he provided: there were more than 120 cuttings of news texts arranged semantically. In contrast, K only submitted one thin vocabulary notebook which he started to keep in secondary school. This may explain why A's

proportions in off-list words were considerably higher than K's, though there was still a gap between A's and the two native authors' off-list words.

7.3. *Explicit awareness and metacognition of successful learners*

Good and poor learners are distinguished mainly by their approaches to learning tasks, such as a deep and surface approach to learning (Biggs, 1993; Rao et al., 2007) or having a repertoire of a wide range of strategies and knowing how to select learning strategies for specific learning tasks (Cohen, 1998, Gu, 2003). This study provides evidence for the view that successful learners are also marked by their explicit awareness and metacognition of the processes and contexts of learning; it adds to our understanding of how successful learners plan and engage in learning tasks. Both A and K fully perceived the learning environment and learning resources available to them; they had clear learning goals for L2 vocabulary and made plans in conjunction with sustained efforts to achieve the goals. In a “semi-rich-language” learning environment and when academic studies gave them full exposure to English, their efforts for vocabulary learning were concentrated on news reading and practising using vocabulary output in writing, which was in sharp contrast with what they did in the secondary school, i.e. memorising vocabulary lists. It is obvious that the shift in learning context made them re-evaluate their strategy use and re-regulate their learning behaviour and efforts. This exemplifies the essential traits for being good learners; they are “learning theorists” (Gu, 2003, p. 73) and metacognition of their learning situation helps them select the strategies that are congruent with their learning tasks and contexts.

8. Conclusion

Chinese learners are not necessarily innate rote learners for language learning as portrayed in the literature. In a ‘semi-language-rich’ learning environment, Chinese learners, as shown by this study, have ample opportunities to discover new vocabulary and put it directly into use.

Essay submissions further pushed them to practise using the learned vocabulary in academic writing. This explains why the two students undertook a natural learning approach and made remarkable achievements compared with their peers. At the surface level, the two students took a similar learning approach; at the deep level one was more systematic in managing his vocabulary learning and put more efforts into using learned vocabulary in academic writing. This difference can partially explain their differentiated vocabulary learning outcome as measured in their lexical profiles and variation. A key finding from this study is that learners' explicit awareness and metacognition of the learning situation initiate, direct and sustain their learning efforts which are the key to success.

Teachers should be aware of learners' shifting learning contexts, provide appropriate guidance to raise their awareness of the new learning context, perceive the learning sources available and adjust their learning approaches accordingly. Since, as this study shows, English newspapers could become an important source for vocabulary learning, further research should focus on how English newspapers could turn into useful learning materials both inside and outside the classroom learning, particularly when the language learning context is not as rich as in the L2 countries. Teachers may need to push learners to see the value of using news reading, provide them with appropriate guidance regarding how to select news and keep a record of new vocabulary items, prompting them in particular to make early use of these newly learned items.

Due to limited space, the measure focused only on quantitative aspects by obtaining figures regarding learners' lexical profiles and variation. Future studies that measure students' essay writing could examine more qualitative aspects of learners' lexical use, such as lexical phrases, turns of phrase, etc.; these may constitute the construct of lexical idiomaticity which has rarely been explored in L2 studies. A further step is to raise learners' awareness of lexical idiomaticity as this may push them to make additional efforts to advance their language use.

Lastly, this study illustrates how learners' productive vocabulary can be measured in writing; this measure is particularly useful in tertiary education when examinations are replaced by academic assignments. Well-educated native authors' academic writing can be used to set up the standards to which learners' writing is to be compared, but the topics should be matched as genre is likely to affect the proportions at different frequency levels. Future studies may make use of more native authors' writing in different genres to establish the standards. Different from other studies involving short essays (300-500 words), the current study measured only types (but not token) in creating the two students' lexical profiles in much longer essays (1500-3000 words) for the reason that words tend to be repeated in longer essays. In future, researchers may compare both tokens and types in essays of varying length in order to find out how to measure lexical quality more accurately and appropriately.

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Appendix

Interview guideline:

How do you normally discover new English words to be learned?

When you find a new word and think it is important, how do you find out the word meaning?

When you think the new word is important and is worth studying, will you record it? If so, how?

How do you memorise the new words?

How do you make use of newly learned words?