A Longitudinal Study of Swedish Upper Secondary School Students' Vocabulary Development

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Abstract
The importance of vocabulary is stressed as a central aspect of language learning. The aim of this investigation[1] was to study how lexical input from a textbook and use of individual vocabulary notebooks affected Swedish upper secondary school students' vocabulary acquisition by answering the three following research questions: What frequency levels are represented in the vocabulary taught in the textbook? To what extent does the productive vocabulary knowledge of the group, as measured by the Vocabulary Levels Test (VLT), change after exposure to the textbook? To what extent did the students benefit from the vocabulary notebooks? Firstly, a corpus of texts from the textbook was created and analysed to establish the frequency levels of the vocabulary in the corpus. Laufer and Nation's Vocabulary Levels Test was then used to establish the group's productive vocabulary knowledge. Lastly, the effectiveness of the vocabulary notebook was examined. The results indicate that the particular textbook was well-suited in terms of frequency levels and the students' knowledge of K3 words improved, but the vocabulary notebook was not found to be effective.

Keywords: vocabulary; textbooks; learner corpus; vocabulary notebooks; frequency levels

1. Introduction

The importance of vocabulary is stressed as a central aspect of language learning. A recent study by Bergström, Norberg and Nordlund (2022: 393) conducted in Sweden, where this study is also situated, concluded that 'one of the most central components in language learning, namely vocabulary, appears to be left without further instruction in the EFL classroom' and 'teachers showed a great reliance on incidental vocabulary learning, where words were understood as "picked up along the way" while doing other

[1] This article is a revised version of the author's MA thesis.

Holmberg Sjöling, Christian. 2023. 'A Longitudinal Study of Swedish Upper Secondary School Students' Vocabulary Development.' *Nordic Journal of English Studies* 22(2): 59–80.

things, such as reading and playing games'. This approach is problematic since acquiring vocabulary is a complex process. There are a number of features of a word that a learner must be familiar with in order to know it, such as spoken and written form, collocations and associations (Nation 2001: 27). Not only do learners have to learn several aspects of a word, but they must also learn *many* words in order to develop language proficiency. For example, Schmitt and Schmitt (2014: 492) suggest that a learner should know the 3,000 most common word families to be able to fully participate in a 'wide range of situations' and daily conversation, while Nation (2006: 59) states that a learner should have knowledge of between 8,000–9,000 of the most common word families to comprehend 98 percent of authentic written discourse. Whilst the process of learning vocabulary may be challenging for a learner, the benefits of a well-developed vocabulary are many. It improves the learner's overall academic success, reading comprehension and opportunity to succeed in higher education (e.g., Laufer and Ravenhorst-Kalovski 2010; McMillion and Shaw 2009; Pecorari et al. 2011; Yu 2009). Teachers and researchers frequently identify learners' vocabulary knowledge as in need of additional improvement, and overall, there appears to be a lack of a systematic approach by teachers in terms of vocabulary teaching (e.g., Nation 2001; Schmitt 2008; Schmitt, Jiang and Grabe 2011; Schmitt and Schmitt 2014; Walker and Allan 2018). It is within this context that this study takes place, examining how lexical input from a textbook and use of individual vocabulary notebooks affect Swedish upper secondary school students' vocabulary acquisition.

2. Background

2.1 Learning and teaching vocabulary in the English classroom

The phenomenon of knowing a word is complex and challenging for students. Nation (2001: 23–59) considers several distinct aspects of what it means to know a word (word knowledge) and makes a distinction between a learner being able to recall and recognize the appropriate meaning of the word (receptive knowledge) and using the word in multiple contexts (productive knowledge). Automaticity is also an important part of word knowledge and refers to whether or not the learner is able to recall and use the word quickly and almost without any conscious effort (Gass and Selinker 2008: 231). It should be mentioned here that word learning is incremental and does not follow an explicit path; for example, it is

possible to have some productive knowledge before having receptive knowledge Nation (2001: 23–59). Furthermore, receptive knowledge and productive knowledge have a complex and layered relationship with vocabulary breadth (how many words are known) and vocabulary depth (how well they are known), which are aspects that need to be learned in order to reach productive mastery of a word (Nation 2001: 27).

A learner must know several different variables to reach productive mastery of a word and this includes awareness of form, meaning, collocation, associations, grammar, register and more (Nation 2001: 27). It becomes evident that reaching productive mastery of a word is a complex process and it is further complicated by how different words have what Nation (2001: 23–24) refers to as different learning burdens: some words are harder to learn for students depending on their language background, and the different aspects of what it means to know a word may increase its learning burden. In this study, the majority of the participants have Swedish as a first language and are learning English as a second language. Both languages are Germanic, share a history and are a part of Western culture, i.e., the languages are closely related, and thus, the learning burden should be lighter. But at the same time, the participants will still experience the learning burden of some words to be higher since learning burden is not only transfer-related (Nation 2001: 23–24). Some words also have, for example, a higher learning burden due to their intrinsic properties because, for example, spelling, length, register and grammar affect the process of learning a new word (e.g., Laufer 1997).

Teaching students vocabulary in the classroom may be done either incidentally or intentionally. It is either the by-product or the focus of the learning activity (e.g., Hulstijn 2005). The two methods co-exist in the classroom and can be used for different purposes depending on what the teacher intends the outcome of the learning activity to be: a common incidental learning activity is reading, as it does not necessarily focus on developing vocabulary, but is instead concerned with language in use (e.g., Schmitt 2008). Several studies have shown that reading may result in vocabulary gains (e.g. Pellicer-Sánchez and Schmitt 2010; Waring and Nation 2004). The uptake is, however, not significant, and therefore Waring and Takaki (2003: 130–163) suggest that reading as an incidental vocabulary learning activity is more suited for developing knowledge about words that the student is already familiar with rather than for learning new vocabulary (this also indicates that words need to be recycled

in order to be learned). Other studies concerned with vocabulary uptake from incidental learning activities have shown that, for example, watching television and listening do not result in any significant vocabulary gains (e.g. Vidal 2003; Peters and Webb 2018). This is indicative of a discrepancy between research and practice, since teachers appear to be relying on incidental learning to a high extent while research implies that this is inefficient (Walker and Allan 2018: 194; Bergström, Norberg and Nordlund 2022: 393). Instead, it is suggested that vocabulary should be taught intentionally and explicitly to facilitate learning, retention, and productive mastery; the naturalistic usage-based learning approach is simply considered insufficient for acquiring second-language vocabulary (e.g., Cobb and Horst 2004; Laufer 2005; Schmitt and Schmitt 2020). For example, Min (2008: 73) found that there was an increase in vocabulary gain when combining reading with explicit vocabulary learning activities that facilitated analysis of target vocabulary and noticing.

From a teacher's perspective, it seems that intentional learning approaches to vocabulary should be favoured; however, incidental approaches could be improved if a teacher helps students develop learning strategies that allow them to deal with unknown vocabulary. This becomes especially important if one considers the number of words a learner must know to gain proficiency—there are simply too many words to teach (Laufer and Nation 1999: 36–37). There are several useful strategies such as learning how to use a dictionary, utilising context to guess or breaking down the word into separate chunks (Nation 2001: 130). These strategies might be time-consuming for students to acquire, but at the same time, they might increase overall acquisition as the students learn to apply them when encountering, for example, mid-frequency and low-frequency words (Nation 2001: 130). Vocabulary acquisition is further complicated by the students' need to internally process a new word since new vocabulary items require deeper internal processing for students to reach productive mastery. Dubiner (2017: 457) agrees regarding the variables identified by Nation (2001: 27) that one must know in order to have productive mastery of a word; however, she makes it explicit how a student must *process* the word internally to learn it (e.g., Eckerth and Tavakoli 2012; Sökmen 1997). In other words, vocabulary acquisition requires more than shallow processing.

Word frequencies are used in language teaching pedagogy to decide what words students should learn to be able to fully participate in different

discourses. It has previously been suggested that high-frequency vocabulary consists of the 2,000 most frequent word families (K1 and K2) and low-frequency vocabulary to be above the 10,000-frequency level (K10+) (e.g., Schmitt and Schmitt 2014). However, these levels are debated, and there is a call to change these categorisations: the 3,000 most frequent word families should be considered high-frequency vocabulary and words above the 9,000-frequency level should instead be regarded as low-frequency, while all word families in-between (3,000–9,000) ought to be considered mid-frequency vocabulary (e.g., Nation 2006; Schmitt and Schmitt 2014). Nation (2001: 23–59) argues that teachers have to make a cost/benefit analysis of what vocabulary to teach since he believes the focus should be on high-frequency vocabulary and teaching students strategies to deal with low-frequency words. At the same time, several studies suggest that students who know only high-frequency vocabulary struggle with handling written academic material in English (e.g., Laufer and Ravenhorst-Kalovski 2010; McMillion and Shaw 2009). The current investigation is concerned with Swedish upper secondary school students studying the course English 6 (CEFR level B2.1[2]), which is one of the courses needed to be eligible for higher education in Sweden. The students who complete the course are expected to be able to read, for example, authentic scientific articles in English even if they study a programme taught in Swedish (e.g., McMillion and Shaw 2009). Consequently, Nation's claim appears to be contradictory, as he also suggests that a student should know between 8,000–9,000 of the most common word families to understand 98 percent of authentic written discourse (Nation 2006: 59).

2.2 Teaching English vocabulary with textbooks and notebooks

The language input in various textbooks has been widely criticised from various perspectives: for lacking adequate models for pragmatic language use and spoken grammar (e.g., Gilmore 2004) and for having dialogues that are 'overly correct' and artificial (e.g., Cameron 2001; Kirk and Carter

[2] The Common European Framework of Reference (CEFR) is a scale that describes students' language proficiency ranging from *Basic user* (A1–A2), *Independent user* (B1–B2) and *Proficient user* (C1–C2) (Council of Europe 2001) and Milton (2010) estimates that a student should know between 4,500–5,500 most common words families at CEFR level B2.1.

2010; Rebenius 2005; Tyler 2012; Wray 2000). Crucially, vocabulary is also pointed out as a problematic component since textbooks often lack core vocabulary (e.g., Gouverneur 2008; Koprowski 2005; Nation 2001). The 2,000 General Service List of English words (GSL) is considered to contain must-know words that one could use as a foundation when writing textbooks, but, instead, it seems that the vocabulary included in textbooks is a matter of personal preference rather than being based on frequency lists or the GSL (e.g., Abello-Contesse and López-Jiménez 2010; Meara and Suárez García 2010; Nation 1993). Furthermore, the vocabulary included in textbooks is also criticised for not recycling words enough, which is important because a student must encounter a word several times in various ways to learn it (Nation 2001: 27).

Vocabulary notebooks have been shown to have a positive impact on students' vocabulary acquisition. Schmitt and Schmitt (1995: 133–136) suggest that any vocabulary programme should be designed in relation to certain principles; for example, the best way to remember new vocabulary is to incorporate it into already known language, organized vocabulary is easier to learn, more mental processing increases retention, recalling a word several times makes it more likely that a learner will be able to do so in the future, and recycling words increases the chance for learners to acquire them. These principles mesh well together with the different aspects of processing such as the Involvement Load Hypothesis and noticing (e.g., Hulstijn and Laufer 2001; Schmidt 2010). Additionally, several studies have also shown that the use of vocabulary notebooks by students may promote learner independence, linguistic gain, and development of strategic knowledge (e.g., Fowle 2002; Walters and Bozkurt 2009). Dubiner (2017: 456–466) concludes how vocabulary notebooks had a positive impact on vocabulary retention and acquisition among her participants, while McCrostie (2007: 246–255), on the other hand, states that students' selection of vocabulary does not automatically lead to productive mastery of basic vocabulary. It should be mentioned here that the participants in Dubiner's study (2017) were 13 English teacher trainees, which means that there is a possibility of higher motivation and engagement compared to the upper secondary school students who participated in this investigation.

2.3 Previous studies of Swedish students' vocabulary acquisition

There is a growing body of research concerning the vocabulary acquisition of Swedish students. Walker and Allan (2018: 191–212) investigated Swedish upper secondary school students' vocabulary usage and found that a group of English 6 students, from the same region as those who participated in this investigation, dealt with high-frequency and low-frequency vocabulary well, as they used 75 percent of the words correctly (i.e., words beyond frequency level K1 and K2). The most frequent errors made by the students were connected to word form and misspelling influenced by pronunciation (Walker and Allan 2018: 206). The Uppsala Learner English Corpus (ULEC) has also proven to be useful in terms of identifying frequent errors made by Swedish students in upper secondary school. ULEC has been used by teacher trainees for their final projects and they have discovered several areas that the Swedish upper secondary school students could improve; students struggle with, amongst other things, verb forms, especially subject/verb agreement, article usage, capitalisation and the s-genitive (regrettably, these studies do not explicitly focus on vocabulary) (Johansson and Geisler 2009: 181–185). Furthermore, the teacher trainees discovered that Swedish students in upper secondary school tend to 'write like they speak' with simple sentence structures and a frequent use of discourse markers (Johansson and Geisler 2009: 183–184).

Although the research on Swedish students' vocabulary acquisition is slowly growing, there is a lack of research in relation to frequency, but some attention has been given to other aspects of the vocabulary acquisition of Swedish students. Sundqvist and Wikström (2015: 65–76) concluded that students who play digital games acquired more English vocabulary than those who did not, and interestingly, the gameplay also had a positive impact on their grades. Their findings have possible implications for future teaching. Sundqvist and Wikström (2015: 74) suggest that teachers 'incorporate a systematic use of language diaries (or something similar) to map learners' out-of-school language-related contacts and based on the given information, design or recommend suitable learning tasks'. Language diaries can relate to, for example, a digital game that the students are interested in, which might be especially successful considering that youths in the expanding circle countries, like Sweden, spend a lot of their time playing games (Sundqvist and Wikström 2015: 74). Additional studies have also confirmed the positive impact of

extramural activities (i.e., any contact a student has with English outside the classroom) on Swedish students' vocabulary acquisition (e.g., Olsson and Sylvén 2015; Sundqvist and Sylvén 2014). Norberg, Vikström and Kirby (2018: 895–904) investigated different Swedish upper secondary school students' strategies and understanding of vocabulary acquisition and found that the students who participated in their study believed meaning and form to be important parts of word knowledge, but that being able to use the word in context is *essential*. However, the students also 'reported that they primarily employ rather mechanical strategies when studying, implying a focus on memorising isolated language items' (Norberg et al. 2018: 904). Mechanical strategies in this case constitute simply translating the words from English to Swedish (or vice versa) without paying much attention to context. Norberg et al. (2018: 904) assume that the students' strategy is connected to how vocabulary knowledge is assessed and how tests for measuring vocabulary are constructed.

3. Aim

Given how complex the practice of teaching and learning vocabulary is, the aim of this study is to investigate if Swedish upper secondary school students' vocabulary acquisition is affected by lexical input from a textbook and use of individual vocabulary notebooks, by answering the following research questions:

1. What frequency levels are represented in the vocabulary taught in the textbook?
2. To what extent does the productive vocabulary knowledge of the group, as measured by the Vocabulary Levels Test (VLT), change after exposure to the textbook?
3. To what extent did the students benefit from the vocabulary notebooks?

4. Participants, material and method

4.1 Participants

The participants in this investigation were students that I taught in the course English 6 between August 2020 and March 2021 at an upper secondary school in Sweden. I discussed the issue of consent with the two

principals responsible for the students, both of whom verbally consented to participating in the study and the students' oral consent to participate was deemed to be sufficient, which they gave when they were informed about the intentions of my inquiry. The participation of the students was voluntary, and they were reminded several times during the study that it was important that they did not feel coerced and that they could end their participation in the study at any time without any repercussions. The students were all studying their second year of upper secondary school and attended various vocational programmes, for which English 6 is not mandatory. In Sweden, students are allowed to choose a small number of courses as a part of their upper secondary school education; some students decide to study subjects that interest them a lot, while others, particularly students who attend vocational programmes, opt for studying English 6 in order to be eligible for higher education in the future.

There were 34 students aged between 16–18 who participated: 4 of them identified as female and 30 identified as male. I introduced the study and mentioned the aim of my investigation before the study began. Two important things should be mentioned here: firstly, I taught a majority of the students the year before in the course Swedish 1 and a few of them in English 5; secondly, 5 male and 1 female student did not have Swedish as a first language—their first languages were either from Africa, Asia or the Middle East (which could have impacted their vocabulary acquisition). In order to be eligible to study English 6, students must pass the course English 5. This means that all the participants received at least a passing grade (E) for a course that should reflect CEFR level B1.2 (English 6 should then reflect CEFR level B2.1). However, it should be mentioned here that the students' knowledge of English varied greatly within the group and, if one looks at their grades from English 5, one can establish that they are quite weak, as the majority of the students ranged between grades C–E. To form a reliable basis for the study, it was essential to have the students take the Vocabulary Levels Test to establish their vocabulary knowledge prior to and after exposure to the textbook.

4.2 Material

4.2.1 Textbook

The textbook is *Masterplan 2*, written by Gun-Marie Larsson and Catrin Norrby, and published in 2005. It was the book prescribed by the school

and is commonly used by English teachers at the specific school for vocational programmes, as they believe, from previous experience, that it interests vocational students because of its different themes and texts. There were other textbooks available too, but they were specifically designed for students attending preparatory programmes. The textbook consists of five themes and each theme consists of several texts with discussion questions, 'word work' and listening exercises. The students finished three themes, 14 fictional and non-fictional texts, and the average length of each text was 792 words and 11,161 words in total. I digitised all of the texts using my iPhone with the help of TextScannerOCR in order to be able to process the vocabulary levels in the texts. After scanning the texts, I proofread all of them to make sure that they were accurate in plain text format and extracted all proper nouns and adjectives (e.g., *French*, *Washington*).

4.2.2 Vocabulary notebooks

The final part of the material consists of 34 individual vocabulary notebooks that the students kept between August 2020 and March 2021. In August 2020, I introduced the group to these vocabulary notebooks, which were similar to those used by Dubiner (2017). However, as the participants in this investigation were unfamiliar with the concept of vocabulary notebooks and needed some guidance, a *structured approach* was taken, and it was made mandatory for the students to utilise the notebook as it would be a part of their final grade. Their usage was monitored in Google Classroom where the notebook was kept and stored.

The students were asked to write down key vocabulary from the textbook as 'chosen by the author': at the bottom of each page are a number of bolded words present in the actual text with an explanation in Swedish and these words have been regarded as target vocabulary. They were asked to write down approximately 15 words with an explanation (translation or description of the word) for each chapter, sometimes fewer when it was a short text, but 15 was the maximum for didactic reasons, such as not pushing the students too much. Students were also told not to write down any other words but were encouraged to do so in another notebook if they wanted to (which no one did). In the end, their vocabulary notebooks consisted of 165 words.

4.3 Method

To answer RQ1 by establishing which frequency levels were represented in the textbook, I used the online resource Compleat Lexical Tutor (specifically VocabProfiler VP-Compleat). This resource allowed me to determine the vocabulary frequency levels present in the texts read by the students. I opted for BNC-COCA-25 as it consists of 25 distinct frequency levels and is based on the British National Corpus and the Corpus of Contemporary American English. The texts were pasted in the input box for analysis and the output shows the frequency level of each word *type* (distinct words) while *tokens* (the total number of individual occurrences) are ignored, as the focus is on the former.

To answer RQ2, regarding the productive vocabulary knowledge of the students, I utilised Laufer and Nation's productive Vocabulary Levels Test (VLT) (1999). It is a common way of measuring students' productive English vocabulary. There are different versions of the VLT, but the compelled productive VLT was used in this investigation to establish the participants' vocabulary knowledge and how it developed over time: *compelled* refers to how the first letters of each word are given in the test, thus, eliminating the ability to come up with similar words that also could fit in the sentence. The test requires students to produce words at specific word frequencies (K2, K3, K5 and K10[3]) and in relation to an academic word list: the academic word list was excluded from this study as it demands more than the students are expected to know at this point in their studies. One of the greatest values of the VLT is that it suggests which frequency level students know and which levels they need to practice more (a student must score above 83% in order to 'pass' a level) (Cobb 2021). I printed out two different versions of Laufer and Nation's VLT (1999) and had the students take the tests in the classroom under exam conditions before and after lexical input from the textbook (I used version A first in August 2020 and then version B in March 2021 made available by Cobb 2021). These tests were then assessed manually and the results were digitised, organised and visualised. I also used IBM Statistics SPSS to perform a paired samples t-test to calculate whether the changes in terms of the students' vocabulary levels were statistically significant.

[3] It should be mentioned here that the frequency levels of the VLT do not align exactly with BNC-COCA-25 since they are based on older frequency lists and thus one should be careful when comparing the two.

To address RQ3, I constructed a test based on Dubiner's end of the year vocabulary notebook analysis (2017: 460). My test, unlike Dubiner's (2017: 460), was a standard test for the whole group since I had to have a more structured approach. The test consists of 29 different words out of 165 words present in all of the students' vocabulary notebooks, and were chosen in relation to frequency levels (all the words in the test belonged to frequency level K3 and beyond). The test is straightforward: its first column lists a word from the notebook and they are asked to mark the second column if they do not remember the word at all. If the students vaguely remember the word, they should write whatever they remember about the word in the third column. If the students remember the word, they should write the translation or an explanation in the fourth column, and finally, in column five, the students should try to use the word in a sentence. The test was printed and taken by the students during a regular class under exam conditions. One student was ill, so there were 33 students who took the test. I then digitised the results.

5. Results and discussion

5.1 Frequency levels represented in the textbook

The output from VocabProfiler VP-Compleat is presented in Table 1 and depicts vocabulary *types* arranged in separate levels and intervals consisting of a thousand words (K) (Table A in the Appendix shows frequency levels for each text). Note that K levels for which there was no data are not included in Table 1.

Table 1 illustrates how words classified as K1 (52%), K2 (20%) and K3 (10%; e.g., *consumers*, *extent*, *procedures*) are the most frequent ones in the fourteen texts from the textbook followed by K4 (5%; e.g., *authentic*, *prey*, *monarch*), K5 (3%; e.g., *diversion*, *moustache*, *vicious*) and K6 (2%; e.g., *bachelor, luggage*, *vitality*) words. The Off-list (3%) is also one of the more prominent categories and consists of words not found by VocabProfiler VP-Compleat (*southward*, *woodenly*, *singsong* etc.). Furthermore, after K6 there is a gradual decline in the percentage of types. These words (K7–K9) may be considered mid-frequency vocabulary, and several studies suggest that students should learn mid-frequency words to be able to deal with, for example, written academic material in English more proficiently (e.g., Laufer and Ravenhorst-Kalovski 2010; McMillion and Shaw 2009). This is particularly important in this scenario since English 6 makes students eligible for higher education where they are

expected to be able to process, for example, research articles in English even if they study a programme in Swedish. Low-frequency vocabulary is also an important part of students' proficiency and is represented in the textbook: K10 (e.g., *cellulose*, *decapitated*, *frolic*), K12 (e.g., *gargantuan*, *morphing*, *skulked*), K15 (e.g., *aquiline*, *polenta*, *protuberant*), and K19 (e.g., *hypoglycemic*, *nitro*). It becomes evident that the textbook contains opportunities to explicitly acquire mid-frequency and low-frequency vocabulary and practice strategies for dealing with low-frequency vocabulary. The students were continuously encouraged to consult dictionaries and practice using key vocabulary in the exercises that were a part the textbook. Thus, they dealt with contextualised target vocabulary many times in various ways, which should encourage acquisition (e.g., Nation 2001; Min 2008; Nordlund 2016; Siepmann 2008).

Table 1. Overall frequency levels represented in the texts from the textbook (raw figures and percentages)

Frequency level	**Types**
K1	1291 (52%)
K2	503 (20%)
K3	248 (10%)
K4	130 (5%)
K5	79 (3%)
K6	47 (2%)
K7	37 (1%)
K8	27 (1%)
K9	13 (0.5%)
K10	13 (0.5%)
K11	8 (0.3%)
K12	11 (0.4%)
K13	5 (0.2%)
K14	5 (0.2%)
K15	5 (0.2%)
K16	2 (0.1%)
K17	1 (0.1%)
K18	1 (0.1%)
K19	2 (0.1%)
K25	1 (0.1%)
Off-list	72 (3%)
Total	2501 (100%)

5.2 The students' vocabulary knowledge pre- and post-treatment

The results from the pre- and post-treatment VLT are presented in Table 2 (there are 18 words for each level). Nation's VLT consists of five levels: K2, K3, K5, K10 words and an academic word list, however, the latter was excluded since it is beyond what the students are expected to know in English 6.

Table 2. VLT mean scores as a group before and after exposure to the textbook

	%		**Mean**		**SD**		
Freq. level	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	**p-value**
K2	66%	68%	11.9	12.2	± 3.8	± 2.5	0.66
K3	37%	61%	6.7	11.6	± 3.3	± 3.3	<0.001
K5	36%	34%	6.6	6.1	± 4.4	± 3	0.54
K10	24%	15%	4.3	2.8	± 3.5	± 2.6	0.04

Table 2 shows that the students' knowledge of K2 (66% pre- and 68% post-treatment) and K5 (36% pre- and 34% post-treatment) words barely changed following lexical input from the textbook. However, the students displayed a *large* lexical gain in terms of K3 words (37% pre- and 61% post-treatment). A paired samples t-test also indicated that these results are *highly* significant ($p<0.001$). At the same time, the students' knowledge of K10 words declined from 24% to 15%, representing a statistically significant decrease ($p<0.04$).

The students' vocabulary knowledge development, as measured by the VLT, is interesting for several reasons. First, the students passed the course English 5, which should represent CEFR level B1, before beginning the course English 6, and one may argue that certain students should not have passed it in terms of vocabulary proficiency. For example, one student who participated in this study knew only 33% K2, 17% K3, 11% K5, and 5% K10 words at the beginning of English 6 (four other students had similar results). Only one of the students showed signs of minor improvement throughout this study. The knowledge requirements for English 5 are similar to English 6 and they do not explicitly state how developed a students' lexical knowledge should be. Obviously, this is unfortunate, as the demands of the course English 6 may be too high; the leap from knowing less than a third of K1 words to dealing with mid-frequency and low-frequency vocabulary regularly is difficult, especially if a student lacks strategies for dealing with unknown vocabulary (e.g., Nation 2001; Norberg et al. 2018). Cobb (2021) also states, for example,

that a student should score above 83% before moving on to the next frequency level.

One may draw certain conclusions based on the group's performance on Nation's VLT. They still have some way to go before they score 83%, but their performance is not as bad as the quantitative results suggest. The students wrote the test under exam-like conditions and several variables may have affected their performance, such as tiredness, stress or lack of motivation. One must also consider how the four weaker students lowered the score for the entire group; in other words, it is possible that the group's knowledge of K2 and K3 words are better than the VLT shows. How does one account for the students' improved knowledge of K3 words? One would like to assume that this is connected to lexical input from the textbook and working with the vocabulary notebook; however, it is impossible to pinpoint exactly what caused the gain in this study if one considers the impact of and exposure to extramural English, all other incidental exposure and any other instruction effects (this is a feature of, more or less, all longitudinal vocabulary research) (e.g., Sundqvist and Wikström 2015). Several of the students who performed well on the VLT told me during the investigation that they enjoy playing a lot of computer games outside school, and my experience as a teacher is in line with Sundqvist and Wikström's (2015) study: the students who play a lot of digital games are more likely to have a more developed English vocabulary and better grades.

5.3 The effectiveness of the vocabulary notebook

I evaluated the vocabulary notebooks in March 2021. The results regarding the 29 words are presented in Table 3 (note that one of the 34 students missed the test due to illness, as mentioned in section 4.3).

Table 3. Vocabulary notebook assessment mean results as a group

	Don't remember	**Vaguely remember**	**Can translate or explain**	**Can use in a sentence**
Mean	17.2	1.8	9.4	9.8
SD	± 4.9	± 2.1	± 5.1	± 4.6

Table 3 shows that the vocabulary notebook was not efficient in the context of this investigation for several reasons. The students did not remember 17.2 out of 29 words on the vocabulary notebook assessment

test, but they were able to put 9.8 out of 29 words in a sentence if they could explain it first (9.4). Sometimes the students were able to use the word in a sentence successfully without being able to explain it (thus illustrating the complexity of word knowledge; see section 2.1). They had the opportunity to work with the vocabulary notebook for almost seven months, and therefore, one could expect that the scores would be higher since the vocabulary notebook is supposed to promote linguistic gain, learner independence and development of strategic knowledge (and the notebook was graded in relation to the course English 6) (e.g., Fowle 2002; Walters and Bozkurt 2009; Schmitt and Schmitt 1995: 133–136). As a teacher, I continuously stressed the importance of the notebook, and the students were given time during classes to work with it and make sure that they understood different aspects of each word and how it is produced in context. However, due to COVID-19, almost all classes were taught online, and therefore, it was difficult to know whether the students actually did what they were told. One may argue that vocabulary notebooks are efficient, but very dependent on context; unlike Dubiner (2017: 456–466), I had to have a structured approach instead of allowing the students to independently choose vocabulary, which, in theory, might have motivated them more. However, a majority of the students needed structure and I made this decision based on previous knowledge of the students. It is also possible that the results of the vocabulary notebook test would have been better if it consisted of fewer than 29 words. Furthermore, a physical notebook designed in a different way may have had a better outcome. Moreover, vocabulary notebooks as a learning strategy may have suited some students better than others.

6. Limitations

This study is limited in several ways. For example, the COVID-19 pandemic is likely to have impacted the investigation since a majority of the classes were taught online instead of in person, i.e., it is difficult to know how much attention the students actually paid to the textbook (including all the exercises in it) and the vocabulary notebook. My experience is that students collaborated extensively throughout the whole year instead of doing all the work themselves. It is also difficult to establish where the students have acquired vocabulary because students today are exposed to a lot of English outside the classroom. At the same time, the difficulty of assessing a student's 'actual' vocabulary cannot be

stressed enough; for example, a student may have had a 'bad' day when writing the VLT or the vocabulary notebook assessment resulting in an output that does not reflect their true knowledge.

Appendix

Table A. Frequencies for all individual texts

Freq. level	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Text 11	Text 12	Text 13	Text 14
K1	390 (69%)	232 (76%)	169 (70%)	387 (62%)	189 (87%)	406 (73%)	406 (70%)	231 (75%)	43 (84%)	226 (70%)	170 (77%)	203 (72%)	64 (73%)	339 (66%)
K2	83 (15%)	40 (13%)	25 (10%)	84 (13%)	16 (7%)	65 (12%)	67 (12%)	43 (14%)	4 (8%)	44 (14%)	25 (11%)	36 (13%)	11 (12%)	95 (19%)
K3	35 (6%)	18 (6%)	11 (5%)	40 (6%)	3 (1%)	23 (4%)	24 (4%)	17 (5%)	-	23 (7%)	10 (4%)	30 (11%)	12 (14%)	57 (11%)
K4	15 (3%)	7 (2%)	14 (6%)	31 (5%)	1 (0.5%)	16 (3%)	19 (3%)	7 (2%)	2 (4%)	4 (1%)	6 (3%)	3 (1%)	1 (1%)	12 (2%)
K5	11 (2%)	-	5 (2%)	18 (3%)	2 (1%)	12 (2%)	12 (2%)	2 (0.6%)	1 (2%)	6 (2%)	7 (3%)	5 (2%)	-	2 (0.4%)
K6	2 (0.3%)	2 (0.6%)	4 (2%)	9 (1%)	3 (1%)	5 (1%)	15 (3%)	3 (1%)	-	4 (1%)	2 (1%)	-	-	-
K7	5 (0.9%)	2 (0.6%)	6 (2%)	8 (1%)	1 (0.5%)	5 (1%)	5 (1%)	-	-	4 (1%)	-	-	-	3 (0.6%)
K8	2 (0.3%)	1 (0.3%)	-	8 (1%)	-	2 (0.4%)	2 (0.3%)	3 (1%)	1 (2%)	4 (1%)	2 (1%)	1 (0.4%)	-	1 (0.2%)
K9	1 (0.2%)	-	1 (0.4%)	6 (1%)	-	1 (0.2%)	5 (0.9%)	-	-	-	-	-	-	-
K10	4 (0.7%)	1 (0.3%)	-	3 (0.5%)	-	2 (0.4%)	2 (0.3%)	-	-	1 (0.3%)	-	-	-	-
K11	1 (0.2%)	-	-	1 (0.2%)	-	3 (0.5%)	1 (0.2%)	2 (0.6%)	-	-	-	-	-	-
K12	1 (0.2%)	-	1 (0.4%)	4 (0.6%)	-	-	2 (0.3%)	1 (0.3%)	-	2 (0.6%)	-	-	-	-
K13	-	-	-	4 (0.6%)	-	1 (0.2%	-	-	-	-	-	-	-	-
K14	-	-	-	1 (0.2%)	-	1 (0.2%)	2 (0.3%)	1 (0.3%)	-	-	-	-	-	-
K15	1 (0.2%)	-	2 (0.8%)	-	-	1 (0.2%)	1 (0.2%)	-	-	-	-	-	-	-
K16	1 (0.2%)	1 (0.3%)	-	-	-	-	-	-	-	-	-	-	-	-
K17	-	-	-	1 (0.2%)	-	-	-	-	-	-	-	-	-	-
K18	-	-	-	-	-	1 (0.2%)	-	-	-	-	-	-	-	-
K19	-	1 (0.3%)	-	1 (0.2%)	-	-	-	-	-	-	-	-	-	-
K20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K25	-	-	-	-	-	-	1 (0.2%)	-	-	-	-	-	-	-
Off-list	15 (3%)	1 (0.3%)	2 (0.8%)	16 (3%)	2 (1%)	15 (3%)	18 (3%)	-	-	4 (1%)	-	2 (0.7%)	-	3 (0.6%)
Total	568 (100%)	306 (100%)	240 (100%)	622 (100%)	217 (100%)	559 (100%)	582 (100%)	310 (100%)	51 (100%)	322 (100%)	222 (100%)	280 (100%)	88 (100%)	512 (100%)

References

Primary sources

Christian's Learner English Corpus. 2019. Compiled by Christian Holmberg Sjöling.

Larsson, Gun-Marie, and Catrin Norrby. 2005. *Masterplan 2*. Stockholm: Liber AB.

Secondary sources

Abello-Contesse, Christián, and Dolores M. López-Jiménez. 2010. The treatment of lexical collocations in EFL textbooks. In *Exploring new paths in language pedagogy: Lexis and corpus-based language teaching*, edited by Maria Moreno Jaén, Fernando Serrano Valverde, and Maria Calzada Pérez, 95–109. London: Equinox.

Bergström, Denise, Norberg, Cathrine, and Marie Nordlund. 2022. 'Words are picked up along the way': Swedish EFL teachers' conceptualizations of vocabulary knowledge and learning. *Language Awareness* 31(4): 393–409.

Cameron, Lynne. 2001. *Teaching languages to young learners*. Cambridge: Cambridge University Press.

Cobb, Tom. n.d. Compleat Lexical Tutor. Accessed 1 February 2021. http://www.lextutor.ca/.

Cobb, Tom. n.d. Compleat Web VP. Accessed 1 February 2021. http://www.lextutor.ca/vp/comp.

Cobb, Tom. 2021. Vocabulary Levels Test (Productive). Accessed 1 February 2021. https://www.lextutor.ca/tests/levels/productive/.

Cobb, Tom, and Marlise Horst. 2004. Is there room for an academic word list in French. In *Vocabulary in a second language*, edited by Paul Boogards and Batia Laufer, 15–38. Amsterdam: John Benjamins.

Council of Europe. 2001. *Common European Framework of Reference for languages: Learning, teaching, assessment.* Cambridge: Cambridge University Press.

Dubiner, Deborah. 2017. Using vocabulary notebooks for vocabulary acquisition and teaching. *ELT Journal* 71(4): 456–466.

Eckerth, Johannes, and Parveneh Tavakoli. 2012. The effects of word exposure frequency and elaboration of word processing on

incidental L2 vocabulary acquisition through reading. *Language Teaching Research* 16(2): 227–252.

Fowle, Clyde. 2002. Vocabulary notebooks: implementation and outcomes. *ELT Journal* 56(4): 380–388.

Gass, Susan M., and Larry Selinker. 2008. *Second Language Acquisition: An introductory course*. 3rd ed. New York: Routledge.

Gilmore, Alex. 2004. A comparison of textbook and authentic interactions. *ELT Journal* 58(4): 363–374.

Gouverneur, Céline. 2008. The phraseological patterns of high-frequency verbs in advanced English for general purposes: a corpus-driven approach to EFL textbook analysis. In *Phraseology in foreign language learning and teaching*, edited by Fanny Meunier and Sylviane Granger, 223–243. Amsterdam: John Benjamins.

Hulstijn, Jan. H. 2005. Incidental and intentional learning. In *The handbook of Second Language Acquisition*, edited by Catherine J. Doughty and Michael H. Long, 349–381. Oxford: Wiley-Blackwell.

Hulstijn, Jan. H., and Batia Laufer. 2001. Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. *Language Learning* 51: 539–558.

Johansson, Christine, and Christer Geisler. 2009. The Uppsala Learner English Corpus: A new corpus of Swedish high school students' writing. In *Multilingualism: Proceedings of the 23rd Scandinavian Conference of Linguistics: Uppsala University, 1–3 October 2008*, edited by Anju Saxena and Åke Viberg, 181–190. Uppsala: Acta Universitatius Upsaliensis.

Kirk, Steven, and Ronald Carter. 2010. Fluency and spoken English. In *Exploring new paths in language pedagogy: Lexis and corpus-based language teaching*, edited by Maria Moreno Jaén, Fernando Serrano Valverde, and Maria Calzada Pérez, 25–38. London: Equinox.

Koprowski, Mark. 2005. Investigating the usefulness of lexical phrases in contemporary coursebooks. *ELT Journal* 59(4): 322–332.

Laufer, Batia. 1997. What's in a word that makes it hard or easy: Some intralexical factors that affect the learning of words. In *Vocabulary: Description, acquisition and pedagogy*, edited by Norbert Schmitt and Mike McCarthy, 140–155. Cambridge: Cambridge University Press.

Laufer, Batia. 2005. Focus on form in second language vocabulary learning. *EUROSLA Yearbook* 5: 223–250.

Laufer, Batia, and Paul Nation. 1999. A vocabulary-size test of controlled productive ability. *Language Testing* 16(1): 33–51.

Laufer, Batia, and Geke C. Ravenhorst-Kalovski. 2010. Lexical threshold revisited: Lexical coverage, learners' vocabulary size and reading comprehension. *Reading in a Foreign Language* 22(1): 15–30.

McCrostie, James. 2007. Examining learner vocabulary notebooks. *ELT Journal* 61(3): 246–255.

McMillion, Alan, and Philip Shaw. 2009. Comprehension and compensatory processing in advanced L2 readers. In *Crossing languages and research methods: Analyses of adult foreign language reading*, edited by Cindy Brantmeier, 123–146. Charlotte, NC: Information Age Publishing.

Meara, Paul, and Jesús Suárez Garcia. 2010. Missing words: the vocabulary of BBC Spanish courses for adults. In *Exploring new paths in language pedagogy: Lexis and corpus-based language teaching*, edited by Maria Moreno Jaén, Fernando Serrano Valverde, and Maria Calzada Pérez, 77–84. London: Equinox.

Milton, James. 2010. The role of classroom and informal vocabulary input in growing a foreign language lexicon. *Journal of Applied Linguistics* 27: 59–80.

Min, Hui-Tzu. 2008. EFL vocabulary acquisition and retention: Reading plus vocabulary enhancement activities and narrow reading. *Language Learning* 58(1): 73–115.

Nation, Paul. 1993. Sixteen principles of language teaching. In *Of Pavlova, poetry and paradigms: Essays in honor of Harry Orsman*, edited by Laurie Bauer and Christine Franzen, 209–224. Wellington: Victoria University Press.

Nation, Ian Stephen Paul. 2001. *Learning vocabulary in another language*. Cambridge: Cambridge University Press.

Nation, Ian Stephen Paul. 2006. How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review* 63(1): 59–82.

Norberg, Cathrine, Anna Vikström, and Emma Palola Kirby. 2018. Secondary school students' understanding of strategies for vocabulary acquisition: a phenomenographic approach to language learning. *Journal of Language Teaching and Research* 9(5): 895–904.

Nordlund, Marie. 2016. EFL textbooks for young learners: A comparative analysis of vocabulary. *Education Inquiry* 7(1): n. pag. doi: 10.3402/edui.v7.27764.

Olsson, Eva, and Liss Kerstin Sylvén. 2015. Extramural English and academic vocabulary. A longitudinal study of CLIL and non-CLIL students in Sweden. *Apples: Journal of Applied Language Studies* 9(2): 77–103.

Pecorari, Diane, Aileen Irvine, and Hans Malmström. 2011. English for academic purposes at Swedish universities: Teachers' objectives and practices. Ibérica: Revista de la Asociación Europea de Lenguas para Fines Específicos (AELFE) 22: 55–78.

Pellicer-Sanchéz, Ana, and Norbert Schmitt. 2010. Incidental vocabulary acquisition from an authentic novel: Do *things fall apart*? *Reading in a Foreign Language* 22(1): 31–55.

Peters, Elke, and Stuart Webb. 2018. Incidental vocabulary acquisition through viewing L2 television and factors that affect learning. *Studies in Second Language Acquisition* 40(3): 551–577.

Rebenius, Inga. 2005. Vad menas med learner autonomy? Några möjliga tolkningar. In *Forskning om undervisning i främmande språk. Rapport från workshop i Växjö 10–11 juni 2004*, edited by Eva Larsson Ringqvist and Ingela Valfridsson, 170–180. Växjö: Växjö University Press.

Schmidt, Richard. 2010. Attention, awareness, and individual differences in language learning. In *Proceedings of CLaSIC 2010*, Singapore, December 2–4, edited by W. M. Chan, S. Chi, K. N. Cin, J. Istanto, M. Nagami, C. W. Sew, T. Suthiwan, and I. Walker, 721–737. Singapore: National University of Singapore, Centre for Language Studies.

Schmitt, Norbert. 2008. Instructed second language vocabulary learning. *Language Teaching Research* 12(3): 329–363.

Schmitt, Norbert, and Diane Schmitt. 1995. Vocabulary notebooks: theoretical underpinnings and practical suggestions. *ELT Journal* 49(2): 133–143.

Schmitt, Norbert, and Diane Schmitt. 2014. A reassessment of frequency and vocabulary size in L2 vocabulary. *Language Teaching* 47(4): 484–503.

Schmitt, Norbert, and Diane Schmitt. 2020. *Vocabulary in language teaching*. Cambridge: Cambridge University Press.

Schmitt, Norbert, Xiangying Jiang, and William Grabe. 2011. The percentage of words known in a text and reading comprehension. *The Modern Language Journal* 95(1): 26–43.

Siepmann, Dirk. 2008. Phraseology in learners' dictionaries. In *Phraseology in foreign language learning and teaching*, edited by Fanny Meunier and Sylviane Granger, 186–202. Amsterdam: John Benjamins.

Sökmen, Anita. J. 1997. Current trends in teaching second language vocabulary in *Vocabulary: Description, acquisition and pedagogy*, edited by Norbert Schmitt and Michael McCarthy, 237–257. Cambridge: Cambridge University Press.

Sundqvist, Pia, and Liss Kerstin Sylvén. 2014. Language-related computer use: Focus on young L2 English learners in Sweden. *ReCALL* 26(1): 3–20.

Sundqvist, Pia, and Peter Wikström. 2015. Out-of-school digital gameplay and in-school L2 English vocabulary outcomes. *System* 51: 66–76.

Tyler, Andrea. 2012. *Cognitive linguistics and second language learning: Theoretical basics and experimental evidence*. London: Routledge.

Vidal, Karina. 2003. Academic listening: A source of vocabulary acquisition? *Applied Linguistics* 24(1): 56–89.

Walker, Terry, and Rachel Allan. 2018. Bridging the gap between university and upper secondary school English studies: The ULE project. *ICAME Journal* 42: 191–212.

Walters, JoDee, and Neval Bozkurt. 2009. The effect of keeping vocabulary notebooks on vocabulary acquisition. *Language Teaching Research* 13(4): 403–423.

Waring, Rob, and Paul Nation. 2004. Second language reading and incidental vocabulary learning. *Angles on the English-speaking world* 4: 97–110.

Waring, Rob, and Misako Takaki. 2003. At what rate do learners learn and retain new vocabulary from reading a graded reader? *Reading in a Foreign Language* 15(2): 130–163.

Wray, Alison. 2000. Formulaic sequences in second language teaching: principle and practice. *Applied Linguistics* 21/4): 463–489.

Yu, Guoxing. 2010. Lexical diversity in writing and speaking task performances. *Applied Linguistics* 31(2): 236–259.