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Vocabulary in EAP learning materials: What can we learn from teachers, learners, and corpora?

Abstract

Despite the role of teachers and learners in vocabulary learning and teaching, no studies have combined the information from these sources with that from corpora to examine vocabulary in EAP learning materials for learners in EFL contexts. This study employed a mixed-method approach which combined corpus, learners, and teachers to investigate vocabulary in all core materials in an EAP course for postgraduates in China. First, the vocabulary levels of 537 students in this course were measured. Then, the vocabulary in the course learning materials was analyzed with RANGE (Heatley et al., 2002). Finally, semi-structured interviews were conducted with six teachers teaching in the EAP course. As a whole the learners had mastered only the most frequent 1,000 words. However, to achieve reasonable comprehension of their learning materials, they would need to know the most frequent 4,000 words. Interviews with teachers also revealed that vocabulary in the materials appeared to be difficult for learners. One possible reason for the heavy vocabulary load of the learning materials was the insufficient attention to vocabulary in the design of these materials, which was in turn due to either the lack of knowledge or insufficient knowledge of research-based principles on vocabulary instruction.

Keywords: vocabulary; test; learning materials; teacher cognition; corpus; lexical coverage

1. Introduction

In recent years, there is an increasing demand for students in various EFL contexts to pursue their study in university programs which consist of a reasonable proportion of English-medium academic communication (Author et al., 2021; Dearden, 2015). To smoothly transfer to studying in these courses, students usually need to take compulsory English for Academic Purposes (EAP) courses to develop their academic language skills (Akbarian, 2010; Coxhead, 2018, 2021). Universities normally accept students from various regions, and those learners may have diverse English learning experiences and language proficiency. The diversity in students' language proficiency makes it difficult for teachers in these EAP courses to select or design materials to match their students' language levels. Due to the lack of resources, time, and expertise, many teachers may decide to use or adapt commercial EAP textbooks by well-known publishers and develop in-house materials to supplement these textbooks. The extent to which these learning materials actually match the levels of learners in these courses remains to be answered. As vocabulary knowledge is closely related to students' comprehension of learning materials and their academic success (e.g., Coxhead, 2020), exploring vocabulary in the learning materials of EAP courses in EFL contexts would help to address this question to some degree.

Previous studies on vocabulary in EAP learning materials (e.g., Author et al., 2017b; Wood & Appel, 2014) have consistently indicated that from the lexical perspective, EAP textbooks do not well prepare learners for their subsequent academic studies in English-medium university programs. However, several areas need further investigation. To begin with, none of the earlier studies focused specially on EAP learning materials in EFL contexts despite the increasing popularity of EAP courses in EFL contexts (Cheng, 2016; Hyland & Shaw, 2016). In particular, earlier research on vocabulary in EAP learning materials has mainly relied on the analysis of commercial EAP textbooks by well-known publishers. These textbooks are often designed with the assumption that EAP learners already know the most frequent 2,000 word families of general vocabulary before starting their EAP study, and therefore, focus on words at lower frequency levels and academic words (e.g., Slaught & Pallant, 2015). This assumption comes from Coxhead's (2000) decision on excluding the most frequent 2,000 high-frequency word families from her Academic Word List (AWL). However, Coxhead (2021) pointed out that this decision was based on her experience when teaching EAP learners in New Zealand and may not always be relevant to EAP learners in EFL contexts, who could probably have a lower vocabulary level

before starting their EAP study. In fact, research revealed that a considerable number of EAP learners in different EFL contexts had insufficient knowledge of the most frequent 2,000 words (e.g., Akbarian, 2010; Author, 2020b). This suggests that these learners may struggle with comprehending commercial EAP textbooks if these textbooks are used as their learning materials. Yet no studies have explicitly examined vocabulary knowledge of learners in a specific EAP course in EFL contexts and the lexical demands of their learning materials.

Apart from the lack of focus on EAP courses in EFL contexts, research on EAP learning materials shares the limitation of EAP vocabulary research. That is, most of them are solely based on quantitative corpus-based analysis of texts (Coxhead, 2018). Qualitative data could enrich the findings from quantitative corpus-based analysis (Coxhead, 2018) and information from learners and teachers can bring further insights into text analysis (Author, 2020a; Author et al., 2020; He & Godfroid, 2018; Coxhead, 2018; Flowerdew, 2015). Combining corpus-based analysis of EAP learning materials and assessment of the vocabulary knowledge of learners who actually use these materials would provide a better idea of the relevance of these materials for these learners. Meanwhile, in EAP courses, teachers usually adapt commercial EAP textbooks and design supplementary materials for their students (Jordan & Gray, 2019; Skoufaki & Petrić, 2021; Stoller, 2016). Involving teachers in the evaluation of vocabulary in EAP learning materials would provide a deeper insight into the extent to which vocabulary is taken into account in the design and adaptation of learning materials for EAP learners.

In recognition of these gaps, this exploratory study investigated vocabulary in the learning materials of an EAP course for postgraduate students in China from an integrated viewpoint. In particular, it drew on information from (a) a corpus analysis of vocabulary in the course learning materials, (b) a test of the prior vocabulary knowledge of the learners enrolling to this course, and (c) interviews of the opinions of the teachers working in this course about the appropriateness of vocabulary in the learning materials for their students. The specific EAP course was chosen because it shared features of many EAP courses in EFL contexts (see Section 3.1). Moreover, focusing on one specific course would make it possible for us to examine vocabulary in the learning materials from various angles. This would then help us to achieve a deeper understanding of the lexical challenges of learning materials faced by EAP students in EFL contexts, and propose some implications for the design and adaptation of these materials so

that they can better support the language development of these students. Finally, by exploring EFL teachers' opinions about the vocabulary in the learning materials, this study would expand our knowledge on teacher cognition in vocabulary instruction, an underexplored area of vocabulary research (Bergström et al., 2021).

2. Literature review

2.1. Vocabulary in EAP materials

Textbooks play a key role in English language teaching because they scaffold learning (Harwood, 2014; Bondi, 2016). Therefore, most studies on vocabulary in EAP materials has focused on vocabulary in textbooks. These studies have mainly examined the extent to which EAP textbooks correspond to the vocabulary that university students tend to meet and use in their academic study by comparing the vocabulary in EAP textbooks with that in university laboratories and tutorials (e.g., Author et al., 2017b) or university textbooks (e.g., Wood & Appel, 2014). These studies consistently reported that from the lexical perspective, EAP textbooks did not seem to provide much support to their learners' subsequent academic studies in English-medium university programs. While these findings are useful, textbooks are only one kind of EAP learning materials (Stoller, 2016). In many EAP courses, teachers adapt textbooks and develop in-house materials to supplement these textbooks to match their learners' needs (Jones & Durrant, 2010; Skoufaki & Petrić, 2021; Stoller, 2016). Relying solely on the analysis of textbook corpora would not provide a thorough picture of the lexical challenges faced by EAP students. Thus, research on vocabulary input provided by in-house EAP materials as well as textbooks would be valuable. This need has been explicitly pronounced by material researchers such as Harwood (2014).

Recognizing this gap, Skoufaki and Petrić (2021) recently examined the occurrence of academic vocabulary in the learning materials (a commercial textbook and in-house handouts) of an EAP course in the UK. Their corpus analysis showed that a number of academic words appeared in these materials although the teachers did not specifically intend to include academic words when selecting and developing the materials. However, the repetition rate of these academic words was too low for incidental learning to occur. By focusing on the learning materials of a specific EAP course, Skoufaki and Petrić's study highlighted the value of investigating context-specific EAP learning materials in providing important insights into EAP students' vocabulary exposure.

However, this study only focused on occurrence of academic vocabulary while the vocabulary load is also an important factor when evaluating EAP learning materials (Coxhead, 2021). Further, Skoufaki and Petrić's study was based on the U.K. context. Given that EAP materials are typically adapted or developed in-house by course teachers to cater for specific learners' needs, Skoufaki and Petrić (2021) called for more vocabulary research into such materials in other contexts. Such research could allow EAP teachers from different contexts to make research-informed decisions in material selection and adaptation by comparing their contexts to those studies. In response to this call, the present study attempts to investigate vocabulary in the learning materials from a specific EAP course in an EFL context.

In addition to the corpus analysis of EAP learning materials, information from teachers and learners who use those materials would provide further insights into the relevance of the materials for learners and useful implications for making the materials better fit learners' proficiency level. Although some studies (Authors, 2020a; Nguyen, 2020) have combined information from corpora and learners to examine the vocabulary in general English textbooks for high-school students, no studies have drawn on information from both sources to explore the vocabulary in EAP learning materials. In fact, no attempts have been made to combine information from corpora, learners, and teachers to investigate vocabulary in EAP learning materials. The present study aims to fill this gap.

2.2. Teacher perceptions of vocabulary learning and teaching and EFL learners' vocabulary knowledge

According to Borg (2003, p.81), teacher cognition, 'what teachers know, believe, and think', is shaped by four factors: prior language learning experience, teacher education, contextual factors, and classroom practice. Teachers' prior experience as a language learner formed the basis of their initial cognition towards language teaching and learning, which may eventually influence their teaching practice. Teacher education is also a factor that might affect teachers' cognition, but its impact varies across different studies. Contextual factors (e.g., principal's requirements, school policies) may modify teachers' cognition. Classroom practice and teacher cognition mutually influenced each other. Especially, teachers' cognition has a powerful influence on their teaching practice (e.g., Bailey, 1996; Breen et al., 2001; Gatbonton, 2000; Richards, 1996).

Despite the importance of teacher cognition, studies exploring teachers' cognition on vocabulary learning and teaching are very limited in number. Several studies have investigated teacher perceptions about vocabulary learning and teaching. They found that althougth teachers understood the importance of vocabulary in language learning, they either did not see vocabulary as a learning objective in its own right or were not fully aware of the principles of vocabulary learning and teaching (Author, 2020b; Bergström et al., 2021; Coxhead, 2011 as cited in Coxhead, 2018). Together these studies indicated that information from teachers would help to explain why the principles suggested by vocabulary research work or do not work in real classrooms. In recognition of this value, several studies have involved teachers in the evaluation of word lists (Author et al., 2020; Simpson-Vlach & Ellis, 2010) and word difficulty (Bardel et al., 2012; Daller et al., 2003; He & Godfroid, 2018). Yet, to the best of our knowledge, no studies have sought for the information from teachers in the investigation of English language textbooks. This is surprising given that teachers are those who use and adapt textbooks to match the language levels of learners in a specific context.

Compared to teacher cognitions, EFL learners' vocabulary knowledge has attracted considerable attention from vocabulary researchers. Most research has focused on EFL learners in General English courses (e.g., Authors, 2020a; Nguyen, 2020; Webb & Chang, 2012). Several studies have measured vocabulary knowledge of learners in EAP courses in EFL context such as Vietnam (Author, 2020b), Iran (Akbarian, 2010), and Japan (Sakata, 2019). They revealed that a large number of these learners had insufficient knowledge of the most frequent 2,000 words. However, EAP materials are usually designed with the assumption that students already know the most frequent 2,000 words when starting their EAP study (Slaught & Pallant, 2015), and thus usually focus on academic words that are outside the most frequent 2,000 words such as items from Coxhead's (2000) AWL. The insufficient vocabulary knowledge of EAP learners found in previous studies suggests that the learning materials in many EAP courses may not be appropriate to their vocabulary levels. As none of these studies examined the vocabulary in their participants' learning materials, this hypothesis remains to be confirmed.

2.3. Research questions

The literature review indicates the need for a mixed-method approach which combines information from learners, corpora, and teachers to achieve a comprehensive understanding of

vocabulary in the learning materials of a specific EAP course in the EFL context. It also suggests the importance of exploring teachers' perception about vocabulary in learning materials and postgraduates' vocabulary knowledge. In recognition of these needs, the present study examined the vocabulary load and the coverage of academic vocabulary (represented by Coxhead's (2000) AWL) in the learning materials of an EAP course for postgraduate students in China. The vocabulary load was investigated because it would provide indication of the lexical challenges faced by learners when using the materials. The coverage of the AWL was examined because the AWL was the vocabulary learning target of the EAP textbook under investigation as well as many other EAP courses. This focus was also motivated by the teacher participants in the current study, who evaluated the learning materials in relation to the AWL. In addition, this study investigated the vocabulary knowledge of students in this course and the opinions of their teachers about the vocabulary in the learning materials. Such information would supplement the information from corpus analysis to help us achieve a deeper insight into vocabulary in the EAP learning materials. In particular, the study would address three research questions:

1. What is the vocabulary level of postgraduate students in an EAP course from an EFL context?

2. What is the vocabulary load of, and coverage of AWL in, the learning materials in this course?

3. What are the perceptions of the teachers in this course about the extent to which the vocabulary in the learning materials matched their students' level?

3. Methodology

This study adopted a mixed-methods approach of both quantitative and qualitative analyses to investigate vocabulary in EAP learning materials for EFL learners from the perspectives of learners, corpora, and teachers.

3.1. Learner participants and their learning context

The learner participants were 537 first-year postgraduate students (318 males and 219 females aged between 21 to 26 years old) from an EAP course at a university in the east of China. We purposefully recruited this group of participants because they had studied in a wide variety of universities across China prior to participating in this study. That means these participants can represent university students at many other Chinese universities, if not all. Moreover, these students shared features of postgraduate students in many EAP courses in China and other EFL

contexts (e.g., Iran in Akbarian, 2010). They were accepted at the postgraduate level through a nationwide entrance examination for postgraduates (the Unified National Graduate Entrance Examination in China). This examination is based on a norm-referenced procedure. To be accepted to the postgraduate programs, apart from passing their subject-specific tests, the learner participants had to get 37 out of 100 in the English test. Before enrolling to the EAP course, they had learned general English for at least 10 years from primary school to undergraduate study. The English language learning was test-oriented with limited exposure to English outside class (Cheng, 2016; Gu, 2003).

The EAP course was a prerequisite course in their 2.5-3-year postgraduate programs. After completing this course, they would study various academic majors (e.g., engineering, science, arts, education, medicine, law). About 20% of the courses in their subsequent academic study would be delivered in English, in which students needed to read academic textbooks, write academic essays, and listen to academic lectures in English. The EAP course aimed to help students to develop their academic reading and writing skills as well as knowledge of vocabulary in the AWL. This means, vocabulary is not the only focus in such course, which is typical in EAP contexts as evident in studies such as Zhang and Cheng (2021), and Skoufaki and Petrić (2021). It ran for four months with two 90-minute sessions each week and was delivered by teachers having the same L1 as the students. Given the features of the learner participants and their learning context, it is expected that the findings of this study may indicate an overview of the English vocabulary knowledge of the students across many Chinese universities, and other EAP students in similar EFL contexts.

3.2. EAP learning material corpus

A corpus of 88,622 words was built from all core learning materials in the participants' EAP course (one textbook and one handbook). The textbook (52,467 words) was written by Slaught and Pallant (2015) and have been widely used in China and across the world (Appendix 1). It focused on academic reading which consisted of materials adapted from authentic journal articles, academic books, and book reviews on multiple subject areas (e.g., science, social science, and business). The handbook (36,155 words) was compiled by the teachers in the EAP course based on a selection of popular academic writing books in China and worldwide (Appendix 2). It focused on academic writing (e.g., research writing and CV writing). According

to the designer, the motivation to design the handbook is to supplement the textbook and satisfy the needs of the students in the current EAP program who had a relatively low English proficiency and were unfamiliar with academic genres. The textbook had been used for four years in this EAP course while the handbook had been used for one year. It is important to note that although those EAP learning materials were from a specific course, the purposes of textbook adoption and in-house material development were common across many EAP courses (see Skoufaki and Petrić, 2021 for more cases).

3.3. Teacher participants

Six[1] out of nine teachers in the learners' EAP course participated in the present study as shown in Table 1. Similar to EAP teachers in the many other EFL contexts, the teacher participants share the same L1 with their students, speak English as a foreign language, and teach EAP courses in their home country. These teachers have high English language proficiency with at least a Master's degree in English or related subjects. On average, they had taught English at university level in China for 19.33 years (*SD* = 7.61) and in the present EAP program for 7 years (*SD* = 4.20). There was a combination of experienced and less experienced teachers. These teachers also undertook various roles in the EAP program (program leader, teacher, handbook designer and writer[2]). During their years of EAP teaching, they all had taught students from a wide range of subjects including engineering, science, social science, arts, architecture, and medicine. Therefore, it is expected that they would provide comprehensive insights into the relevance of the vocabulary in the learning materials in the EAP course for the learner participants.

Table 1

Teacher participants' information

Teacher participants	Year of teaching experience	Year of teaching in the present EAP program	Highest educational/professional degree	Main responsibility
Ada	28	5	Associate professor	Teacher, handbook writer
Cindy	24	10	Associate professor	Teacher, program leader,

				handbook writer
Lily	24	4	Master's	Teacher, handbook writer
Daisy	22	15	Associate professor	Teacher, handbook writer
Monica	11	5	PhD	Teacher
Emma	7	3	PhD	Teacher, handbook designer and writer

3.4. Measuring students' vocabulary knowledge

At the beginning of their EAP course, the student participants completed Webb et al.'s (2017) Updated Vocabulary Levels Test (UVLT), which consists of five levels with 30 items in each level. The test measures learners' knowledge of the words at the 1,000, 2,000, 3,000, 4,000, and 5,000 word frequency levels in Nation's (2012) BNC/COCA lists, respectively (Figure 1).

	argue	contribute	quit	seek	vote	wrap
cover tightly and completely						
give to						
look for						

Figure 1. An example item of the UVLT (Webb et al., 2017)

The UVLT was chosen because it has been carefully validated and widely used to measure the vocabulary levels of learners in various EFL contexts (e.g., Author, 2020b; Nguyen, 2020; Webb et al, 2017). This test was deemed to be more appropriate for the present study than the other vocabulary levels tests such as the Vocabulary Levels Test (VLT) by Schmitt et al. (2001) for three reasons. First, unlike the VLT, which only measures vocabulary knowledge at the 2000, 3000, 5000, and 10,000 word levels, the UVLT measures learners' knowledge of words at each of the 1,000 word frequency level from the 1,000 to the 5,000 word levels. Since previous research has shown that EFL learners were unlikely to have mastered vocabulary above 5000 frequency level (e.g., Akbarian, 2010; Authors, 2020a; Matthews & Cheng, 2015), the UVLT scores can provide a more precise idea of the vocabulary levels of EFL learners. Second, the UVLT was based on Nation's (2012) BNC/COCA word lists, which reflect the most useful and current high-frequency words for EFL learners (Authors, 2016; Author et al., 2020). However,

the VLT was based on frequency lists derived from the 1930s and 1940s, which may not reflect the most recent vocabulary of English. It should be noted that although the VLT has a section for academic vocabulary, the present study did not aim to measure the learner participants' knowledge of academic vocabulary because the main purpose of the study to is estimate the extent to which learners' prior knowledge of general vocabulary help them to deal with the learning materials in the EAP course. The study was conducted at the beginning of the EAP course. Before the EAP course, the participants learned English for general purposes; therefore, it is expected that academic vocabulary was unlikely to be their existing vocabulary knowledge.

The first author supervised the process to ensure that the participants took the test seriously. Instructions were delivered in Chinese so that the participants were clear about the test requirements. It took the participants about 25 minutes to complete the test in the first week of their postgraduate study. Data of the UVLT were input and analyzed with an SPSS for Microsoft Window Release 23.0 package.

3.5. Analyzing vocabulary in the corpus of learning materials

The textbook and the handbook used in the participants' EAP course were collected in PDF or Microsoft Word format and converted into text files to create the corpus of learning materials. Vocabulary in the corpus was then analyzed with RANGE (Heatley et al., 2002). To determine the vocabulary load of the corpus, Nation's (2012) BNC/COCA lists of the 1st -25th 1,000 words and supplementary lists (proper nouns, marginal words, and compounds) were used as the baseword lists. Coverage provided by each of the 1,000 word list plus supplementary lists was accumulated until it reached the 95% and 98% coverage, which indicate reasonable and adequate reading comprehension, respectively. To calculate the coverage of Coxhead's AWL in the corpus, this list was used as the baseword list.

3.6. Interviewing teachers

Once the test data and the corpus data were analyzed, the key findings were summarized for the interviews with the teachers. Based on these findings and the research objective, an interview protocol was developed. It was then piloted with two EAP teachers who used to teach the same course as the present study. Based on the result of the pilot study, the interview protocol was finalized. It encompassed four sets of questions (see Appendix 3 for more details):

1. Demographic information of the teachers

2. Evaluation of the textbook and handbook

3. Perception of vocabulary in the textbook and handbook

4. Reflection on the findings of the learning materials and learners' UVLT analysis

The first part of the interview was about the teacher participants' demographic information (e.g., years of teaching experience, years of teaching English in the present EAP program). The second and third parts of the interview focused on their views on the learning materials in general (e.g., How do you feel about the effectiveness of the textbook in helping your students develop their language proficiency?), and vocabulary in these learning materials in particular (e.g., How do you feel about the appropriateness of the vocabulary used in the textbook to your students?). In the last part of the interview, the participants were shared the key findings about learners' vocabulary levels test and textbook and handbook analysis, and were asked about their views on these findings (e.g., Our study showed that the participants as a whole had mastered only the most frequent 1,000 word families. What do you think about this?).

When the interview protocol was finalized, an invitation letter was sent to all teachers in the EAP program through WeChat, the most popular social media for communication in working environment in China. Upon acceptance of the interview invitation, the first author, set up one-on-one interviews with the teachers (either face-to-face or online) based on their schedule. As the first author also lectured in the same EAP course as the teacher participants, such experience would help her to establish rapport and trust more easily, and engage the teachers more (Cohen et al., 2018). However, one potential limitation of this position is that the sample might be biased from the researcher's initial contact. This bias could possibly have been lessened by recruiting a majority of teachers in the program. The teachers were clearly informed about the purpose of the inquiry from the very beginning. To avoid misunderstanding, they were interviewed in Mandarin. Semi-structured interviews were used to gain insights from the teacher participants. This format was chosen because it allows researchers to focus on certain issues by providing the interviewees with guidance and direction and at the same time follow up interesting developments from the interviewees (Dörnyei, 2007). The total length of the semi-structured interviews varied slightly between participants (30-42minutes). All interviews were audio-taped,

transcribed, and Chinese data extracts were translated into English for this article. For ethical consideration, the interview data were kept anonymous. To ensure anonymity, all interviews were labeled with pseudonyms (e.g., Lily, Emma) when data collection was in progress.

The interview data were coded for content analysis guided by the interview protocol (Cohen et al., 2018). It followed a deductive approach in which the data were grouped according to the pre-arranged categories (Burns, 2010) as presented in Table 2. Then, each category was coded to subcategories (see Table 2) by the first author using Microsoft Word document given the relative small sample size of the interviews. The relevant extracts were highlighted and labeled with different codes. In the coding process, different participants' answers to the interview questions were constantly re-read and compared. The participants were consulted if there was any uncertainty in their responses. To ensure the reliability of coding, the first author and a trained inter-coder coded the data from one participant independently. Percentage of the inter-coder agreement was 92.86%. Discrepancies were resolved through discussion before the first author coded the rest of the data. When all the transcripts were coded, the frequency of each code were calculated.

Table 2

Categories and codes of the interviews

Categories	Codes	Examples
Evaluation of the learning materials	Positive	*I think it (the textbook) can increase their vocabulary size and develop their reading skills.* **(Positive)**
	Neutral	
	Negative	
Perception of the vocabulary	Easy	*I feel the vocabulary is suitable to them.* **(Appropriate)**
	Appropriate	
	Difficult	
Reflection on the findings	Surprised	*Is the (vocabulary) handbook also difficult? From my teaching experience I feel it's a bit easier than textbook.* **(Surprised)**
	Agreed	
	Cannot comment	
Suggestion for pedagogy	Teacher training	*I think teacher training is very important.*

	Learning materials	**(Teacher training)**
	Others	

4. Results

4.1. Vocabulary level of postgraduates

In answer to Research question 1, Table 3 presents the descriptive statistics of the UVLT. According to Webb et al. (2017), learner should have 29/30 correct answers per level to master the 1000, 2000, and 3000 word level and 24/30 correct answer per level to master the 4000 and 5000 word levels. Applying these cut-off points, it can be seen from Table 3 that, as a whole group, the participants had mastered the 1,000 word level of the test but not the other levels.

Table 3

Descriptive statistics of the UVLT

UVLT level	Mean	*SD*
1000 words	29.05/30	1.45
2000 words	24.80/30	3.52
3000 words	21.63/30	4.76
4000 words	15.02/30	5.78
5000 words	7.72/30	6.08
All five levels combined	98.22/150	16.84

Note: 29/30 (96.67%) was the cut-off point for mastery at 1000, 2000, and 3000 word levels, while 24/30 (80%) was the cut-off point for mastery at 4000, and 5000 word levels.

Table 4 presents the score of individual participants. Nearly 60% of the participants had a receptive knowledge of only the most frequent 1,000 words, and more than 20% of the participants had not mastered even the most frequent 1,000 words.

Table 4

Number of participants mastering each UVLT level (N =537)

Mastery level	Number of students	% of students
Yet to master 1000	118	21.97
1000	322	59.96
2000	46	8.57
3000	23	4.28
4000	19	3.54
5000	9	1.68
Total	537	100

Note: 29/30 (96.67%) was the cut-off point for mastery at 1000, 2000, and 3000 word levels, while 24/30 (80%) was the cut-off point for mastery at 4000, and 5000 word levels.

4.2. Vocabulary in the learning materials

In answer to Research question 2, the corpus analysis found that 4,000 and 12,000 words are needed to reach 95% and 98% coverage of the whole corpus, respectively. When the textbook and handbook were analyzed separately, the figure to reach 95% coverage remained the same (4,000 words). However, a smaller number of words were needed to reach 98% coverage of the textbooks (9,000 words) than the handbook (12,000 words). The AWL covers 10.17% of the whole corpus. However, its coverage in the textbook (10.71%) was higher than that in the handbook (9.38%).

4.3. Teachers' perceptions

4.3.1. Teachers' opinions about the vocabulary in the learning materials

In answer to Research question 3, all six teachers agreed that the textbook and handbook were helpful to support their students' development of reading and writing skills, which were the main objectives of their EAP course. They also acknowledged the value of these learning materials in facilitating students' vocabulary development:

> *I think it (the textbook) can increase their vocabulary size and develop their reading skills* (Cindy)

Commenting specifically on the vocabulary in the learning materials, four out of six teachers (Lily, Daisy, Monica, Emma) considered the vocabulary in the textbook challenging for their students. According to these teachers, because some texts in the textbook were from specific disciplines, they included a sizeable number of technical words (e.g., *morbidity, recall*). Emma even made it explicit in the interview that, as the teacher, she needed to note down the meaning of some unknown words when she met them for the first time.

In contrast, according to the other two teachers (Ada, Cindy), who had the longest teaching experience at university level in China, the vocabulary in the textbook suited their students. However, their reasons were different. Ada said that the teachers' book explicitly introduced that the textbook well represented Coxhead's (2000) AWL, a well-known academic word list, which made her think that the textbook was relevant to her EAP students. This reason was confirmed by the corpus analysis in the present study which showed that the AWL covered around 10% of the words in the textbook, which is consistent with the coverage figure reported by Coxhead (2000). Cindy, who was the EAP program leader, drew on her personal teaching experience to explain why she thought the vocabulary in the textbook matched her students' levels:

> *I feel the vocabulary is suitable to them, for example, one text describes population growth, I feel they can understand it, and they really need to use those words* (Cindy)

The teachers' opinions about the appropriateness of the vocabulary in the handbook also varied. Most teachers (Ada, Daisy, Emma, Monica) perceived it as easy for their students. This is surprising given that Ada, Daisy, and Emma were all involved in writing the handbook and

should have perceived the vocabulary there being at the right level for students. These teachers provided different reasons for considering vocabulary in the handbook as easy. Ada thought she intentionally chose vocabulary which was easy to the learners in handbook writing because vocabulary was not the focus of this handbook. Daisy commented that vocabulary in the handbook consisted of the most frequent 2,000 word families in West's (1953) General Service List (GSL) based on her intuition and experience. Emma thought the handbook mainly focused on the writing skills rather than vocabulary, so there were not a lot of new words involved.

Unlike most of her colleagues, Lily, who was also a handbook writer, considered the vocabulary in the handbook difficult in some parts while easy in the others, because there were no principled criteria for guiding vocabulary use in handbook writing. The remaining teacher, Cindy, who was the program leader, found it difficult to comment on the appropriateness of the vocabulary in the handbook because she only used a small proportion of the handbook so far.

4.3.2. Teachers' reflections on the findings of the learner and corpus analysis

The vocabulary test showed that as a whole the learner participants only receptively mastered the most frequent 1,000 words. Commenting on this result, all teachers agreed that this figure well represented their students' vocabulary level. Daisy, who had taught in the EAP course the longest, even said that she thought some secondary school students could even perform better than her students because she felt her son who used to be a secondary school student could do better (in the vocabulary test) than those postgraduates.

The corpus analysis showed that the learners need to know the most frequent 4,000 words to achieve reasonable comprehension of the learning materials in the EAP courses, which was far beyond the current vocabulary level of most students in the EAP course. Commenting on these findings, most teachers (Lily, Emma, Monica, Ada) agreed that the textbook was indeed difficult for their learners. Two other teachers (Daisy, Cindy), however, believed that such textbook is suitable for teaching their students could understand the textbook if they were assisted with help:

> *I feel that the students can answer my questions in general during the class. But they used translation tools, if they did not use such tool, the texts might be difficult for them.* (Daisy)

and that vocabulary in textbooks should be above the learners' current level:

> *They (the postgraduates she taught) might be disappointed if the vocabulary of the textbook is easy for them since their cognition is at a high level.* (Cindy)

Cindy expanded on her point that the texts should not be over challenging to the learners because they might be discouraged. Nonetheless, she did not specify the degree to which the texts should be challenging to the learners.

The teachers' attitudes towards the results of handbook analysis, however, were slightly different. The handbook analysis showed that the handbook has a similar vocabulary burden as the textbook to the learners. Two teachers (Monica, Cindy) found it difficult to comment on this issue because they have not fully used the handbook yet. Meanwhile, three teachers (Emma, Daisy, and Ada) were surprised by this finding. They thought the vocabulary in the handbook should be easy to the learners according to their teaching practice. Especially, Emma, who both involved in designing and writing the handbook, made it explicit that they felt vocabulary in the handbook should be less difficult than the textbook:

> *According to my own teaching experience, vocabulary in the handbook should be easier than the reading (textbook).*

The remaining teacher (Lily) stated that vocabulary in the handbook was difficult to the learners as it involved a considerable number of terms in different areas especially in examples and tasks.

Information from the five teachers who were the handbook writers revealed that one teacher (Lily) did not take vocabulary into consideration when writing the handbook. Explaining for this, Lily said that although she was aware of the importance of vocabulary, it was challenging for her to take it into account when writing the handbook because there was a lack of principled guidance on vocabulary selection.

Even for the four teachers who took vocabulary into account (Emma, Daisy, Ada, Cindy), their level of attention to vocabulary also varied. Emma, Daisy and Ada paid more attention to the content rather than vocabulary when writing the handbook. As stated by Emma, who was both the handbook designer and writer:

> *I did take it (vocabulary) into account, but only to a very small extent. The main focus in handbook writing is content and skills training, vocabulary is not the focus.*

Cindy paid attention to the selection of vocabulary for the handbook by consulting vocabulary lists for College English Test (Band 4 and 6). These tests are popular among students at the tertiary level because scores on these tests are important indicators of their English proficiency level as required by most employers in China. However, she also mentioned that she copied most of the texts from the reference books (see Appendix 2) without modification in the chapter that she wrote. Together, this study showed that the handbook writers tended to rely on their experience and intuition in selecting vocabulary in the teaching materials due to the absence of principled guidelines.

In addition to the findings presented above, the teacher participants were also asked to give feedback on the pedagogical implications in relation to the results of the corpora analysis and learners' vocabulary level test. Since such suggestions are relevant to pedagogy, they have been integrated into the Pedagogical Implications section.

5. Discussion

The present research extends previous research on EAP vocabulary research from several perspectives. First, it is the first study that examined the learning materials, including both global textbook and teacher-created handbook, of an EAP course in the EFL contexts from an integrated view of learners, corpora, and teachers. Second, it is among the few studies that explored teachers' cognition in vocabulary instruction.

5.1. Vocabulary in EAP learning materials

Focusing on an EAP course in the EFL context, this study examined vocabulary in the learning materials from an integrated view by combining vocabulary load of the learning materials, learners' existing vocabulary knowledge, and teachers' perception of vocabulary in the learning materials. To begin with, this study suggested that the vocabulary in the learning materials in this course was too challenging for the majority of these students compared to their existing vocabulary knowledge. The corpus-based analysis of the vocabulary in the learning materials revealed that the participants would need the most frequent 4,000 word families to reach 95% coverage of the textbooks, which allows the learners to achieve acceptable comprehension (Laufer & Ravenhorst-Kalovski, 2010; van Zeeland & Schmitt, 2013). However, results of the UVLT showed that only 5.22% of these participants knew 4,000 or more word families. This means only 5.22% of the participants could get reasonable comprehension of the learning

materials in their EAP course. A small percentage of the participants had mastered either the most frequent 3,000 words (4.28%) or the most frequent 2,000 words (8.57%). Given their vocabulary level, these students may encounter certain difficulty in comprehending their learning materials. Importantly, the majority of participants had either a vocabulary level of 1,000 words (59.96%) or fewer (21.97%), which means that most students in the examined EAP course would need to learn a sizable number of new words (3,000-4,000 words) to achieve reasonable comprehension of their learning materials. Considering that EFL learners could learn an average of 400 words per year (Webb & Chang, 2012), it might be almost impossible for most learners to complete this task within their EAP course (4 months). The insufficient vocabulary knowledge of the learner participants was consistent with the findings of previous research on the vocabulary knowledge of EAP learners in other EFL contexts (e.g., Author, 2020b; Akbarian, 2010; Sakata, 2019). However, expanding on earlier studies, the present study examined learners' vocabulary knowledge and the vocabulary load of their learning materials in a single study and could provide a more precise idea of lexical challenges faced by learners in a specific context when using the materials. Moreover, it also provided solid evidence challenging the assumption of EAP materials that learners have already known the most frequent 2,000 words of general vocabulary when starting their EAP study (e.g., Slaught & Pallant, 2015).

Second, the heavy vocabulary load of the learning materials was also confirmed by the fact that two-thirds of the teacher participants agreed that the vocabulary in the learning materials was challenging for their students. The interviews revealed several reasons for the lexically demanding nature of the examined EAP learning materials. The first possible reason is the insufficient attention to vocabulary by the material designers and writers. Although all of them agreed that vocabulary was important, they either paid more attention to the content rather than vocabulary when writing the handbook or lacked knowledge of principled guidance on vocabulary selection. In other words, vocabulary can hardly be seen as an exclusive learning objective in its own right. This understanding of vocabulary teaching is in line with that of Swedish EFL teachers as discovered by Bergström et al. (2021). Another possible reason for this is because some teachers believed that vocabulary in textbooks should be challenging for students. This means the teachers purposefully selected or designed materials that were lexically demanding for the learners. To some degree, their belief is in line with the suggestions from research that materials and tasks should be beyond students' current language proficiency level

for learning to take place (Krashen, 1981; Vygotsky, 1978). However, what research suggested is that the gap between the language in the materials and students' current language proficiency level should be small so that it allows students to develop further but at the same time does not discourage students from learning. In this EAP course, the gap between the number of words needed to reasonably comprehend the learning material (4,000 word families) and the vocabulary levels of most students (1,000 or fewer word families) was huge. Such a huge gap might discourage the learners from developing academic reading and writing skills as targeted by the EAP courses.

Expanding on previous research, this study employed a mixed-method approach which combined information from multiple sources (corpora, teachers, and learners) and focused on learning materials in a specific EAP course from an EFL context. The findings revealed the gap between the lexical demand of EAP learning materials (including the commercial textbook and self-developed handbook) and the vocabulary knowledge of their users, which was triangulated by the qualitative data from teacher interviews. Moreover, the teacher interviews enabled us to undertand possible reasons for this gap. The current study thus illustrates how corpus findings could be triangulated by qualitative data to achieve more robust findings. Such triangulated research design highlights a novel contribution of the present study to EAP vocabulary research.

5.2. EAP teacher perceptions on vocabulary in learning materials

This study contributes to the language teacher cognition field by providing interesting insights into the cognition of EAP teachers about vocabulary in the learning materials. To begin with, although the teacher participants agreed that vocabulary was important, when designing the handbook, they either did not take vocabulary into consideration or just paid a small attention to vocabulary. This finding is akin to results from earlier studies with teachers in other contexts. Coxhead (2011 as cited in Coxhead, 2018) reported that an EAP teacher in New Zealand in her study claimed that although vocabulary is essential for academic writing, it is 'the hidden curriculum in EAP'. Similarly, Bergström et al. (2021) found that Swedish EFL teachers regarded vocabulary as a component intergrated in other activities (e.g., reading) despite that they considered vocabulary as extremely important in language learning. These findings also aligned with the fact that vocabulary is not the only focus in many EAP courses (e.g., Skoufaki & Petrić, 2021; Zhang & Cheng, 2021). To some extent, these findings lent support to the idea of

Milton (2009), confirming that little attention has been paid to vocabulary in language teaching, learning, and material writing. The lack of knowledge of principled vocabulary instructions was probably the reason that discouraged the teachers to take vocabulary into account when designing the materials. As for those taking vocabulary into account, they paid more attention to the content and language skills than vocabulary because they believed that the main purpose of the handbook was to help students develop their academic writing skills. While this belief was in line with previous research (Bergström et al., 2021; Hermagustiana et al., 2017) and the purpose of the EAP course, research has shown that vocabulary knowledge significantly influenced reading comprehension and writing proficiency (e.g., Laufer & Ravenhorst-Kalovski, 2010; Milton, 2009; Nation, 2013; Schmitt et al., 2011). Therefore, although vocabulary was not the main objective of the EAP course, it was essential to take vocabulary in consideration in the writing of the learning materials.

Second, the interviews also showed that students could be able to understand the materials with support from other sources such as dictionaries. While this belief highlighted the importance of using dictionaries, an important strategy suggested by vocabulary research (e.g., Schmitt, 2008; Yang & Coxhead, 2020), it should be noted that vocabulary learning strategies only have a significant impact if learners apply them in a principled way (Nation, 2013). Moreover, research has suggested that even with assisted reading, to achieve reasonable comprehension, learners would need to know at least 95% of the words in the text (Laufer, 1989; Laufer & Ravenhorst-Kalovski, 2010). Considering the huge gap between learners' current vocabulary level and vocabulary load of the learning materials in the EAP course, it was unlikely that these students would be able to make good use of vocabulary learning strategies such translation tools.

Last, one teacher in the interview considered the coverage of Coxhead's (2000) AWL in the materials as an important criterion to evaluate these materials while another teacher considered the words in the handbook were easy because most of them were in West's (1953) GSL. The teachers got the information of these lists from the teachers' book. These findings are in line with Authors (2020b), indicating that textbooks have a powerful influence on teacher's cognition about vocabulary teaching. This study extends previous research on teacher cognition by showing that teacher cognition can be shaped by the prescribed textbook in addition to prior language learning experience, teacher education, contextual factors, and classroom practice as

summarized by Borg (2003). The AWL has been widely recommended by vocabulary researchers as the vocabulary learning goal in EAP courses, and the GSL has been considered as the basic vocabulary learning goal for learners regardless of their purposes (Coxhead, 2000; Nation, 2013). Therefore, the belief of these teachers showed that they were aware of key findings in vocabulary research. However, it is important to note that the AWL was developed with the assumption that its users had already known the most frequent 2,000 words of general English (Coxhead, 2000, 2021). As most of the student participants in the present study had insufficient knowledge of the most frequent 2,000 words, focusing solely on the AWL words would mean failing to support students' development of the most frequent 2,000 words. These high-frequency words are considered as the crucial starting point of vocabulary learning for any purposes (Nation, 2013); therefore, insufficient knowledge of these words would have a negative impact on learners' comprehension of their learning materials.

Taken together, the interviews with teachers in the examined EAP course showed that these teachers were aware of the principles suggested by vocabulary research to some extent but they did not fully understand these principles, which then affected their decision when selecting, evaluating, or designing learning materials. This finding is novel in that it sheds light on how teacher cognition may be influenced by vocabulary research. It also supports the findings of teacher cognition research that teacher cognition significantly affects their teaching practice (e.g., Bailey, 1996; Breen et al., 2001; Gatbonton, 2000; Richards, 1996). Overall, the insights from the teacher interviews highlight the importance of teachers as the valuable complement to the information from corpora and learners in the evaluation of learning materials. This study is thus a response to call on vocabulary research which explores teacher cognition in vocabulary instruction (e.g., Authors, 2020b; Bergström et al., 2021).

5.3. Vocabulary knowledge of EFL learners

Delving further into EFL learners' vocabulary knowledge, there are some points that merit additional attention. The present study found that EFL learners at the postgraduate level had mastered only the most frequent 1,000 words. When data of individual students were analyzed, the majority of them had insufficient knowledge of the most frequent 2,000 words, which are high-frequency words. Importantly, more than one-fifth of the participants had not even mastered the first 1000 word families. This finding is consistent with much previous research with EAP

learners in Iran (Akbarian, 2010), Vietnam (Author, 2020b), and China (Matthews & Cheng, 2015), but contrasts the findings in a recent study with English literature students in Iran (Janebi Enayat & Derakhshan, 2021). There are two possible reasons for the difference between the results of the present study and Janebi Enayat and Derakhshan (2021). First, while the participants in the present study were non-English major EAP learners, those in Janebi Enayat and Derakhshan's (2021) study were juniors and seniors majoring in English literature at university. It is likely that English major students have a higher level of vocabulary knowledge than non-English major students. Second, the present study used the UVLT to measure learners' vocabulary level while Janebi Enayat and Derakhshan (2021) used the VLT. The difference between the testing tools as mentioned in Section 3.4 may also account for the contrasting results.

Expanding on earlier research, this study suggests that a sizable number of postgraduate students in the EFL context still have insufficient knowledge of high frequency words. This finding is surprising given that these postgraduate students had studied English for a long period of time and had met the English language requirement to be accepted to their postgraduate study. However, as commented by the teachers in the interview, this might be because the present study was conducted at the beginning of the semester, that is, six months after the participants had already passed the Unified National Graduate Entrance Examination. By that time, they had spent a few months on their graduation and a few months for holiday without studying English. Therefore, it is likely that there was certain regression in the postgraduates' vocabulary knowledge after such a long break of over six months.

Despite its contributions mentioned above, the present study has several limitations. First, the participants' vocabulary knowledge was only measured at the receptive level, productive knowledge may provide further insights into learners' vocabulary knowledge. Second, this study only focused on one specific EAP course. This method allowed us to collect data from multiple sources to achieve an in-depth understanding of vocabulary in the learning materials in the specific course. However, these findings were exploratory. It could provide a useful model for a larger scaled study with learners, teachers, and materials in multiple EAP programs and multiple contexts. Such studies would provide a comprehensive picture of the vocabulary in EAP learning materials. Last, we did not investigate learner participants' perceptions of the vocabulary in their

learning materials. It would be useful for future research to shed light on the extent to which they find vocabulary in their EAP learning materials helpful.

6. Pedagogical implications

This study has several implications, which were found to be useful by the teacher participants. As the examined course in the present study shared features of many EAP courses, we hope that these implications would be useful for EAP courses in other contexts. First, this study suggests that when selecting commercial textbooks for their courses, teachers should be aware of the assumption underline the development of these textbooks so that they can evaluate the suitability of the textbooks for their students. Otherwise, it may result in undesirable learning outcomes. For example, the textbook used in the examined EAP course was published by a well-known publisher and had been widely used in other EAP courses. However, analysis of the information from the corpora, learners, and teachers indicated that the vocabulary in the textbook was too difficult for the students in the examined EAP course. It is because the textbook was designed with the assumption that students coming to EAP courses had already known the most frequent 2,000 word families. Yet most of the students in the examined EAP course had insufficient knowledge of these words despite that they had studied English for over 10 years. To make better use of the commercial textbooks for students in their specific contexts, it is important for the teachers to have a clear understanding about the strengths and limitations of textbooks in their own contexts, which is a prerequisite to better adapt them in teaching.

Second, this study suggests that when adapting textbooks or designing supplementary materials in EAP courses, more attention should be given to the vocabulary in these learning materials because vocabulary is the key to communication (Webb & Nation, 2017). In the examined course, the teachers designed a handbook to supplement the textbook in terms of language skills. It is advisable for the teachers to supplement the textbook in terms of vocabulary because the lack of vocabulary knowledge would seriously affect comprehension of the learning materials and hinder the learning of academic vocabulary (Author, 2020a). If most of the students have insufficient knowledge of high-frequency words, apart from academic vocabulary, teachers should also support their students' development of high-frequency words by purposefully using and recycling those words in the supplementary materials. At the same time, the teachers should be cautious about using low-frequency words. If the inclusion of these words is unavoidable,

explanations should be provided on the margins next to the words or a list of glossaries to support learners' reading comprehension but does not distract their attention from high-frequency words and academic words.

Third, this study suggested that the handbook designers and writers either lacked knowledge of or had insufficient knowledge of research-based principles in vocabulary despite their important role in bridging the gaps between research-based information and the teaching practice (Schmitt, 2008). Therefore, EAP course leaders could organize workshops in which vocabulary experts share teachers with key principles in vocabulary research and provide course designers and instructors with training in analyzing and adapting vocabulary in the teaching materials.

Additionally, in EAP courses whose students have insufficient knowledge of high-frequency words like the one in the present study, apart from directly teaching these words, course designers could supplement their students with a collection of graded readers which suit students' level in their reading list upon their acceptance of Master's offer. To ensure the efficacy of this activity, the students should be informed about the purpose of the graded readers so that they can purposefully expand or consolidate their knowledge of high-frequency vocabulary prior to their study. It is equally important to integrated graded readers into assessment, so the learners can be motivated to do such extensive reading.

Last, the teacher participants made two pedagogical suggestions. Increasing students' vocabulary depth was particularly mentioned as one pedagogical implication by the teacher participants in addition to expanding their vocabulary size mentioned above. To achieve this aim, it is important to raise awareness among the students that knowing a word is not limited to knowing the formal aspects of the word and knowing its meaning, they also need to able to use the word (Nation, 2013). Another suggestion from teachers is increasing students' motivation for learning vocabulary. To motivate those students to learn vocabulary, the teachers can choose texts which are relevant to their students' subject area and vocabulary level. Strategy training such as using prefixes also has positive impact on motivation. Since vocabulary testing could also contribute to learning (Nation, 2013), it would be useful to use vocabulary tests in the form of quiz competitions to keep the students motivated.

7. Conclusion

Drawing on the information from learners, corpora, and teachers, this study provided valuable insights into vocabulary in the learning materials in an EAP course in the EFL context. The corpus-based analysis showed that to achieve reasonable comprehension of the learning materials in this course, learners would need to know the most frequent 4,000 words. However, most learners had insufficient knowledge of the most frequent 2,000 words, which indicated that the learning materials might be too lexically demanding for them. The difficulty of the materials was supported by the interviews with the teachers. The interviews also revealed that vocabulary did not receive sufficient attention from the teachers in the development of learning materials. This was due to either their lack of knowledge or insufficient knowledge of research-based principles on vocabulary learning and teaching. Given that vocabulary is not the only focus or even not the focus of many EAP programs (e.g., Bergström et al., 2021; Skoufaki & Petrić's, 2021), this study calls for more attention to vocabulary in the selection and design of learning materials for EAP learners as well as more attention to explicit vocabulary instruction in EAP programs as knowledge of vocabulary is essential for learners' success in their subsequent academic study. It also highlights the value of a mixed-method approach in EAP vocabulary studies which combines information from learners, corpora and teachers to achieve an in-depth understanding of vocabulary in learning materials.

NOTES

[1] The three other teachers were invited but were not available to participate in the present study

[2] The handbook designer decided the content and topics to be covered by the handbook while the handbook writers selected or wrote detailed materials accordingly.

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REFERENCES

Author (2020a).

Author (2020b).

Authors (2016).

Author et al. (2017a).

Author et al. (2017b).

Authors (2020a).

Authors (2020b).

Author et al. (2020).

Author et al. (2021).

Akbarian, I. h. (2010). The relationship between vocabulary size and depth for ESP/EAP learners. *System*, *38*(3), 391−401. https://doi.org/10.1016/j.system.2010.06.013

Bailey, K. M. (1996). The best laid plans: Teachers' in-class decisions to depart from their lesson plans. In K. M. Bailey & D. Nunan (Eds.), *Voices From the Language Classroom* (pp. 15−40). Cambridge University Press.

Bardel, C., Gudmundson, A., & Lindqvist, C. (2012). Aspects of lexical sophistication in advanced Learners' oral production. *Studies in Second Language Acquisition*, *34*(2), 269−290. https://doi.org/10.1017/s0272263112000058

Bergström, D., Norberg, C., & Nordlund, M. (2021). "Words are picked up along the way" – Swedish EFL teachers' conceptualizations of vocabulary knowledge and learning. *Language Awareness*, 1−17. https://doi.org/10.1080/09658416.2021.1893326

Bondi, M. (2016). Textbooks. In K. Hyland & P. Shaw (Eds.), *The Routledge handbook of English for academic purposes* (pp. 323–334). Routledge.

Borg, S. (2003). Teacher cognition in language teaching: A review of research on what language teachers think, know, believe, and do. *Language Teaching*, *36*(2), 81−109. https://doi.org/10.1017/s0261444803001903

Breen, M. P., Hird, B., Milton, M., Oliver, R., & Thwaite, A. (2001). Making sense of language teaching: teachers' principles and classroom practices. *Applied Linguistics*, *22*(4), 470−501.

Burns, A. (2010). *Doing action research in English language teaching: A guide for practitioners.* Routledge.

Cheng, A. (2016). EAP at the tertiary level in China: Challenges and possibilities. In K. Hyland & P. Shaw (Eds.), The Routledge handbook of English for academic purposes (pp. 97–108). Routledge.

Cohen, L., Manion, L., & Morrison, K. (2018). Research methods in education (Eighth ed.). Routledge.

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, *34*(2), 213−238. https://doi.org/Doi 10.2307/3587951

Coxhead, A. (2018). *Vocabulary and English for Specific Purposes Research: Quantitative and qualitative perspectives*. Routledge.

Coxhead, A. (2020). Academic vocabulary. In S. Webb (Ed.), *The Routledge handbook of vocabulary studies* (pp. 97–110). Routledge.

Coxhead, A. (2021). Vocabulary in English in tertiary contexts: Connecting research and learning. *LEARN Journal*, *14*(1), 1–14.

Daller, H., van Hout, R., & Treffers-Daller, J. (2003). Lexical richness in the spontaneous speech of bilinguals. *Applied Linguistics*, *24*, 197−222. https://doi.org/https://doi.org/10.1093/applin/24.2.197

Dearden, J. (2015). *English as a medium of instruction—a growing global phenomenon*. British Council. Retrieved from https://ora.ox.ac.uk/objects/uuid:4f72cdf8- b2eb-4d41-a785-4a283bf6caaa

Dörnyei, Z. (2007). *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies*. Oxford University Press.

Flowerdew, L. (2015). Corpus-based research and pedagogy in EAP: From lexis to genre. *Language Teaching*, *48*(1), 99–116.

Gatbonton, E. (2000). Investigating experienced ESL teachers' pedagogical knowledge. *Canadian Modern Language Review*, *56*(4), 585−616. https://doi.org/10.3138/cmlr.56.4.585

Gu, Y. P. (2003). Fine brush and freehand: The vocabulary-learning art of two successful Chinese learners. *TESOL Quarterly*, *37*(1), 73–104.

Harwood, N. (2014). Content, consumption, and production: Three levels of textbook research. In N. Harwood (Ed.), English language teaching textbooks: Content, consumption, production. (pp. 1–41). Palgrave Macmillan.

He, X., & Godfroid, A. (2018). Choosing words to teach: A novel method for vocabulary selection and its practical application. *TESOL Quarterly*, *53*(2), 348−371. https://doi.org/10.1002/tesq.483

Heatley, A., Nation, P., & Coxhead, A. (2002). *Range: A program for the analysis of vocabulary in texts.* Downloadable from http://www.vuw.ac.nz/lals/staff/paul-nation/nation.aspx.

Hermagustiana, I., Hamra, A., Rahman, A. Q., & Salija, K. (2017). Reflection of teacher cognition in EFL vocabulary instructional practices in Indonesia. *International Journal of English Linguistics*, *7*(5), 34−45. https://doi.org/10.5539/ijel.v7n5p34

Hyland, K., & Shaw, P. (2016). Introduction. In K. Hyland & P. Shaw (Eds.), *The Routledge handbook of English for academic purposes* (pp. 323–334). Routledge.

Janebi Enayat, M., & Derakhshan, A. (2021). Vocabulary size and depth as predictors of second language speaking ability. *System*, *99*, 1–15. https://doi.org/https://doi.org/10.1016/j.system.2021.102521

Jones, M., & Durrant, P. (2010). What can a corpus tell us about vocabulary teaching materials? In A. O'Keefe & M. McCarthy (Eds.), The Routledge Handbook of corpus linguistics (pp. 387–400). Routledge.

Jordan, G., & Gray, H. (2019). We need to talk about coursebooks. *ELT Journal*, *73*(4), 438–446. https://doi.org/https://doi.org/10.1093/elt/ccz038

Krashen, S. (1981). *SLA and second language learning*. Pergamon.

Laufer, B. (1989). What percentage of text lexis is essential for comprehension? In C. Lauren & M. Nordman (Eds.), *Special language: From humans thinking to thinking machines* (pp. 316–323). Multilingual Matters.

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

Matthews, J., & Cheng, J. (2015). Recognition of high frequency words from speech as a predictor of L2 listening comprehension. *System*, *52*, 1−13. https://doi.org/10.1016/j.system.2015.04.015

Milton, J. (2009). *Measuring second language vocabulary acquisition.* Multilingual Matters.

Nation, P. (2012). *The BNC/COCA word family lists.* In http://www.victoria.ac.nz/lals/about/staff/paul-nation.

Nation, P. (2013). *Learning vocabulary in another language* (Second ed.). Cambridge University Press.

Nguyen, C.-D. (2020). Lexical features of reading passages in English-language textbooks for Vietnamese high-school students: Do they foster both content and vocabulary Gain? *RELC Journal*, 1−14. https://doi.org/10.1177/0033688219895045.

Richards, J. C. (1996). Teachers' maxims in language teaching. *TESOL Quarterly*, *30*(2), 281−296.

Sakata, N. (2019). Profiling vocabulary for proficiency development: Effects of input and general frequencies on L2 learning. *System*, *87*, 1−12. https://doi.org/10.1016/j.system.2019.102167

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research*, *12*(3), 329−363.

Schmitt, N., Jiang, X., & Grabe, W. (2011). The percentage of words known in a text and reading comprehension. *The Modern Language Journal*, *95*(1), 26−43. https://doi.org/10.1111/j.1540-4781.2011.01146.x

Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the Vocabulary Levels Test. *Language Testing*, *18*(1), 55–88. https://doi.org/10.1177/026553220101800103

Skoufaki, S., & Petrić, B. (2021). Academic vocabulary in an EAP course: Opportunities for incidental learning from printed teaching materials developed in-house. *English for Specific Purposes*, *63*, 71−85. https://doi.org/10.1016/j.esp.2021.03.002

Simpson-Vlach, R., & Ellis, N. C. (2010). An academic formulas List: New methods in phraseology research. *Applied Linguistics*, *31*(4), 487−512.

Slaught, J., & Pallant, A. (2015). *Reading: English for academic study*. Foreign Language Teaching and Research Press.

Stoller, F. L. (2016). EAP materials and tasks. In K. Hyland & P. Shaw (Eds.), *The routledge handbook of English for academic purposes* (pp. 577–591). Routledge.

van Zeeland, H., & Schmitt, N. (2013). Lexical coverage in L1 and L2 listening comprehension: The same or different from reading comprehension? *Applied Linguistics*, *34*(4), 457−479. https://doi.org/10.1093/applin/ams074

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Webb, S., & Chang, A. C.-S. (2012). Second language vocabulary growth. *RELC Journal*, *43*(1), 113−126.

Webb, S., & Nation, I. S. P. (2017). *How vocabulary is learned.* Oxford University Press.

Webb, S., Sasao, Y., & Ballance, O. (2017). The updated Vocabulary Levels Test. *ITL - International Journal of Applied Linguistics*, *168*(1), 33−69. https://doi.org/10.1075/itl.168.1.02web

West, M. (1953). *A general service list of English words*. Longman.

Wood, D. C., & Appel, R. (2014). Multiword constructions in first year business and engineering university textbooks and EAP textbooks. *Journal of English for Academic Purposes*, *15*, 1−13. https://doi.org/10.1016/j.jeap.2014.03.002

Yang, L., & Coxhead, A. (2020). A corpus-based study of vocabulary in the new concept English textbook series. *RELC Journal*. https://doi.org/1.o0r.g1/107.171/0770/303063386882820290966441 62

Zhang, L. J., & Cheng, X. (2021). Examining the effects of comprehensive written corrective feedback on L2 EAP students' linguistic performance: A mixed-methods study. *Journal of English for Academic Purposes*, *54,* 1−15. https://doi.org/10.1016/j.jeap.2021.101043