

Core Academic Vocabulary in Four Genres of Novice Student Writing

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Abstract

Since written assignments often constitute the main form of assessment in tertiary education, academic writing skills are of paramount importance to university students. The role of academic writing in turn emphasises two aspects vital for successful written production at universities: genre awareness as students are assessed on the production of relevant genres and the use of academic vocabulary regarded as a key element of academic writing style. This study employs a corpus-based approach to explore the usage of academic vocabulary in four genres of assessed academic writing produced by multilingual foundation-level students (N=193) at a UK university. The findings show that in all writing genres there was a small set of core academic vocabulary used by the majority of students in their written assignments, accounting on average for approximately 3.6% - 9% of academic vocabulary types across the genres under investigation. In addition, differences were found in the distribution and function of the core academic vocabulary items across genres. These findings have potentially important pedagogical implications for English for Academic Purposes (EAP) contexts catering for novice student writers.

Keywords: academic vocabulary, academic writing, second language writing, writing genres, international foundation students

Background

Due to the internationalisation of higher education, British universities are characterised by a heterogeneous student population constituting both ‘local’ students as well as ‘international’ or ‘overseas’ students who speak English as their second or additional language (i.e., L2 speakers of English). This diversity in the composition of the student population inevitably leads to varying levels of preparedness for academic study in terms of the students’ literacy skills, with academic writing reported as one of the challenges faced by international students at various levels of study at English-medium universities (e.g., Eldaba & Isbell, 2018; Elturki et al., 2019; Martirosyan et al., 2015; Park, 2016; Ravichandran et al., 2017; Singh, 2015). Central to addressing the students’ learning needs is the concept of ‘academic literacy’, referring to “the

ability to communicate competently in an academic discourse community” (Wingate, 2018, p. 350) encompassing (among other skills) the ability to create and demonstrate knowledge through speaking and writing, which need to be developed by all students new to an academic setting.

Out of all the academic literacy skills, it is academic writing that has been a priority on the language agenda. This is because writing is one of the main forms of demonstrating knowledge and understanding in university contexts with written assignments often forming the principal means of assessment; hence, the difficulties experienced by students at the level of academic literacy are often detected in their written production. Writing is, thus, regarded as a ‘high stakes’ activity performing a gate-keeping role in university education as students need to demonstrate the required standard of academic writing if they are to succeed in their studies (Flowerdew, 2016; Lillis & Scott, 2007; Wingate, 2018; Wingate & Tribble, 2012).

The important role of academic writing highlights two aspects crucial for successful academic written production: genre awareness, as students are assessed on the production of relevant genres in which they are required to express their knowledge (Flowerdew, 2016; Wingate, 2019) and academic vocabulary, which is considered a key element of academic writing style (Hyland & Tse, 2007). In addition, insufficient knowledge of academic vocabulary items has often been associated with a lack of academic success (Gardner & Davies, 2014). It is, therefore, vital for university students to develop awareness of the genres they are required to produce in their specific contexts (Wingate, 2018), while also incorporating specialised vocabulary prevalent in academic texts in order to follow the requirements placed upon them by the academic settings in which they operate.

In light of this, the aim of this paper is to examine the use of academic vocabulary across four different genres of assessed academic writing produced by multilingual foundation-level students at one UK university.

Literature Review

Academic vocabulary defined

Academic vocabulary is one of the following four types of vocabulary commonly distinguished in vocabulary research: *high-frequency* words occurring in all kinds of uses of the language and covering a large proportion of texts; *technical* words relating to a specific subject or topic of the text; *low-frequency* words occurring very infrequently and covering only a small proportion of texts; and *academic* words common in various kinds of academic texts and less common in non-academic texts (Nation, 2001).

Academic words are also referred to as *sub-technical vocabulary* (Baker, 1988; Cowan, 1974; Yang, 1986), *semi-technical vocabulary* (Farrell, 1990), *specialised non-technical lexis* (Cohen et al., 1979), *academic words* (Coxhead, 2000) or *academic vocabulary* (Nation, 2001; Paquot, 2010). Despite the variety of terms used to refer to academic words, there is a widely accepted definition of this type of vocabulary as words occurring with a high frequency in academic contexts, apparent from the definitions of academic words by various scholars who have investigated this kind of vocabulary. According to a definition provided by Coxhead (2000), academic words are “lexical items [which] occur frequently and uniformly across a wide range of academic material” (p. 218). Similarly, Baumann and Graves (2010) refer to academic vocabulary as “words that appear in texts across several disciplines or academic domains” (p. 6). These definitions are close to those of Paquot (2010) who describes academic vocabulary as “a set of options to refer to those activities that characterize academic work, organize scientific discourse and build the rhetoric of academic texts” (p. 28), and Townsend and

Kiernan (2015) for whom academic vocabulary items are “words that appear with much greater frequency in academic texts than in other types of texts, such as literary texts or popular media... typically abstract, technical, nuanced, and/or densely packed with meaning” (p. 113). These definitions highlight the frequency of these vocabulary items in academic texts and underline the important role of academic vocabulary in academic contexts.

The role of academic vocabulary

From the definitions of academic vocabulary, it becomes apparent that academic vocabulary items are an indispensable aspect of academic texts. Coxhead (2000), for example, found that in her 3.5-million corpus containing 414 academic texts published between the early 1960s and the late 1990s and representing four academic disciplines, academic words accounted for approximately 10% of the total words (tokens) in academic texts. Later, in Gardner and Davies's (2014) study drawing on a corpus of 120 million words comprising 13,000 contemporary academic texts from nine disciplines, academic vocabulary covered nearly 14% of academic texts. This demonstrates that this type of vocabulary represents high-frequency words in English for Academic Purposes (EAP) and wider academic contexts. Although academic words are not central to the topic of texts, they are supportive of the texts in which they occur (Coxhead, 2000). Thus, academic vocabulary is regarded as important for both comprehension as well as production of academic texts (Coxhead & Byrd, 2007). As for comprehension of academic texts, this type of vocabulary is recognised as a crucial component of academic reading abilities (Corson, 1997) with insufficient knowledge of academic vocabulary potentially compromising learners' ability to comprehend academic discourse (Donley & Reppen, 2001). In terms of production of academic texts, academic vocabulary is widely regarded as a key element of academic writing style (Hyland & Tse, 2007).

Academic vocabulary items are, thus, such words which students across disciplines encounter in their reading and should also be able to deploy in their written production. Given that written assignments constitute one of the main forms of assessment at universities (Lillis & Scott, 2007), it then follows that there is a link between knowledge of academic vocabulary and academic achievement (Nagy & Townsend, 2012), particularly learners' long-term success (Donley & Reppen, 2001). Hence, the knowledge and appropriate usage of academic vocabulary in written production is crucial for university students, particularly in relation to high-stakes writing and assessment, where academic vocabulary is considered to be a key component of academic success (Nation, 2001). Academic vocabulary can, therefore, be regarded as an important learning goal for learners of EAP (Nation, 2001) and ought to be a high priority for learners pursuing academic study in English (Coxhead & Nation, 2001). This is vital for both L1 as well as L2 speakers of English at all levels of study as control of academic vocabulary may be the most important factor in the ‘gate-keeping’ tests of education (Gardner & Davies, 2014).

Despite the important role of academic vocabulary in university settings, inadequate knowledge of vocabulary has often been highlighted as a challenge for EAP learners (Evans & Green, 2007; Evans & Morrison, 2011a, 2011b) as they are generally less familiar with this type of vocabulary than they are with the technical vocabulary associated with their disciplines (Coxhead, 2000). As academic vocabulary is potentially the most obvious element of academic language (Nagy & Townsend, 2012), it is crucial for learners, teachers as well as vocabulary researchers to know more about the behaviour of these words in academic texts (Coxhead, 2016). Academic vocabulary research and pedagogy have been assisted by academic word lists containing the most frequently occurring vocabulary in academic contexts.

Academic word lists

Academic word lists are compilations of the most frequent lexical items in academic texts, based on the premise that certain words “are likely to be more useful to learners than others, and that it is possible to identify in advance which are most worthy of attention” (Durrant, 2016, p. 50). One of the first compilations of academic words frequently occurring across disciplines was the University Word List (UWL) (Xue & Nation, 1984) containing 836 word families, with a word family defined as “a base word and all its derived and inflected forms” (Bauer & Nation, 1993, p. 253). Later, this word list was updated and replaced by Coxhead's (2000) Academic Word List (AWL) containing 570 word families. Other compilations of academic vocabulary include the Academic Keyword List (AKL) (Paquot, 2010) comprising 930 individual words, the New Academic Word List (NAWL) (Browne et al., 2013) with approximately 2,800 words and the new Academic Vocabulary List (AVL) (Gardner & Davies, 2014) containing 3,015 lemmas, with a lemma referring to all inflectional forms related to one stem belonging to the same part of speech (Kučera & Francis, 1967). To illustrate the difference between the word family and lemma principle, the word family *proceed* subsumes the following members: *proceed* (verb), *proceeds* (verb or noun), *procedural* (adjective), *procedure* (noun), *procedures* (noun), *proceeded* (verb), *proceeding* (verb), *proceedings* (noun). According to the lemma principle, however, the following members would be counted separately: *proceedings* (a noun meaning ‘records’ or ‘minutes’); *procedure* (a noun meaning ‘technique’) and its inflected plural form *procedures*; and *procedural* (an adjective meaning ‘technical’ or ‘routine’) (Gardner & Davies, 2014).

Despite their common goal of providing a compilation of the most frequently occurring academic vocabulary in a variety of texts across scientific disciplines, significant differences can be found between these words lists, as reviewed by Therova (2020), who provided a systematic comparison of existing compilations of academic vocabulary with the aim of assisting EAP researchers and practitioners in making informed decisions with regard to the choice of these lists. The identified differences have been found primarily in their size (ranging from 930 words in the AKL to over 3,000 word types in the AWL or 3,000 lemmas in the AVL), age (ranging from the nearly 40 years old UWL to the most recent AVL published in 2014), organising principle (including lemmas, word families, and individual words), and methodologies used for their compilation (whereby the AWL and NAWL were based on a list of pre-existing general vocabulary and exclude academic vocabulary from general high-frequency words, in contrast to the AVL and AKL which were not based on a pre-existing list of general words). These differences inevitably mean that each of the word lists possesses several potential limitations. The AWL's organising principle around word families has been seen as its weakness due to the “semantic distance of the words that can be included under one headword in a word family” (Brezina & Gablasova, 2015, p. 4), meaning that words belonging to the same word family can display different meanings. The AKL's weakness lies in its relatively small size of the source corpora and a limited number of texts used for its compilation, which were also skewed towards humanities and social sciences. The NAWL provides insufficient information regarding the methodological procedures involved in the creation of this word list, which hinders its comprehensive evaluation. One of the limitations of the AVL has been pointed out by Durrant (2016) who found that approximately half of the AVL words are used very little.

The construction of these academic word lists also reflects the relationship between high-frequency and academic words with one view assuming that learners have already become familiar with high-frequency words and hence regarding academic vocabulary as falling outside

these words. Accordingly, these high-frequency words are excluded from the word list (adopted in the AWL and NAWL). The other view is not based on the assumption that learners have already familiarised themselves with high-frequency words and encompasses all vocabulary items occurring with high frequencies across a wide range of academic texts (adopted in the AVL and AKL).

These academic word lists have, to a varying extent, been used for investigation of academic vocabulary in learner writing, with the vast majority of studies drawing on the AWL (e.g., Brun-Mercer & Zimmerman, 2015; Cons, 2012; Coxhead, 2012; Knoch et al., 2015; Knoch, et al., 2014; Masrai & Milton, 2018; Nadarajan, 2011; Olinghouse & Wilson, 2013; Storch, 2009; Storch & Tapper, 2009; Xudong et al., 2010) and fewer identified studies utilising the AVL (e.g., Csomay & Prades, 2018; Durrant, 2016), perhaps due to its later publication (i.e., 14 years after the AWL). These studies focus on the deployment of academic vocabulary in various contexts and at various levels of study, with some of these studies investigating academic vocabulary usage in different writing genres.

Academic vocabulary in genres of learner writing

Several studies have drawn on academic word lists to explore learners' usage of academic vocabulary in various writing genres. Olinghouse and Wilson's (2013) study, for instance, explored fifth graders' (N=105) vocabulary in persuasive, informative and narrative writing. All three genres revolved around the same topic to eliminate the influences of content knowledge across genres, thereby ensuring that the participants possessed the same topic knowledge to draw on during the writing process. Their study shows the impact of the writing genre as well as topic on the participants' vocabulary deployment in their writing composition. Measured on the basis of the AWL, their study reported a very small percentage of academic words in their participants' writing across all genres under investigation. On average, the participants (who excluded students receiving English as second language services) used approximately 1% of academic words; that is, around 1.5 academic words in each written composition with the narrative writing genre displaying the lowest content of academic vocabulary. Olinghouse and Wilson (2013), thus, suggest that learners need to receive more explicit instruction on academic vocabulary as well as on incorporating these vocabulary items into written compositions.

Drawing on the AVL, Durrant (2016) investigated academic vocabulary usage in university student writing in the British Academic Written English (BAWE) corpus comprising nearly 3,000 written assignments produced by over 1,000 students across four UK universities (University of Warwick, University of Reading, Oxford Brookes University, Coventry University), four levels of study (from first year undergraduate to taught postgraduate), four broad disciplines (Arts and Humanities, Life Sciences, Physical Sciences and Social Sciences), and 13 genre families comprising further finer-grained genres (Nesi & Gardner, 2012). Durrant's (2016) study found a minor but statistically significant variation across genres and a more extensive variation across disciplines, suggesting that discipline has a greater impact on academic vocabulary deployment than genre. He also found that frequently deployed academic vocabulary items differed across disciplines with a small core of 427 AVL items frequently used across 90% of disciplines.

Also drawing on the AVL, Csomay and Prades (2018) explored the usage of academic vocabulary across six genres of university student writing (Response Paper, Comparative Analysis, Exploratory Synthesis, Argument Synthesis, Rhetorical Analysis, and Editorial). The collected texts were coded for their percentage of academic vocabulary. Their findings showed differences in the way academic words were used across these genres with some text types

showing a significantly higher percentage of academic words than the other genres. This highlights the impact of both the genre and rhetorical purposes on the amount of academic vocabulary used. Based on this result, Csomay and Prades (2018) emphasise the importance of explicit teaching of academic vocabulary employing a contextualised and genre-based or text-type specific approach.

All of the studies reviewed here underline the importance of explicit teaching of academic vocabulary. It is important to note, however, that other factors have been found to play a vital role in the acquisition of academic vocabulary and its subsequent usage by student writers. As far as the acquisition of academic vocabulary is concerned, Nagy (1997) believes that reading can be more powerful than teaching as it is “unlikely that instruction accounts for anywhere near as much vocabulary growth as does incidental acquisition from context during reading” (p. 75). This view is supported by Krashen (2012) who argues that reading plays a more important role in the learning of academic vocabulary than instruction. The vital role of reading is also emphasised by Nagy and Townsend (2012) who see reading texts as particularly important for the learning of general academic vocabulary. Similarly, Zimmerman (1997) found that students who tended to read the least reported the most difficulty with academic words. In terms of academic vocabulary usage, Storch and Tapper (2009) also partially attribute the improvement in students’ productive academic vocabulary to exposure to academic texts.

Considering the highly prominent role that academic writing plays in university settings with different genres at the centre of written production and academic vocabulary widely recognised as a key feature of writing style in academic contexts, research into the deployment of academic vocabulary in various genres of assessed academic writing is an important area of vocabulary research. Such research is particularly important in the context of novice students who possess very little or no prior experience with the type of writing required of them in university settings. This is because these students need to develop not only appropriate academic writing style with its prominent features, such as academic vocabulary, but also an awareness of various writing genres that they are required to produce.

Therefore, this paper explores the usage of academic vocabulary across four genres of assessed academic writing produced by L2 novice student writers at a foundation level of study in the context of one UK university. In particular, the following four genres are investigated for the content of academic vocabulary: Exposition Essays, Discussion Essays, Problem Questions, and Research Reports. In doing so, this study seeks to address the following research questions with the aim of exploring productive knowledge of academic vocabulary of L2 novice student writers in their written production:

1. Is there core academic vocabulary shared by the majority of foundation-level students in their assessed academic writing?
2. What is the function of the core academic vocabulary shared by the majority of foundation-level students in their assessed academic writing?

Methodology

Context and participants

The present study was conducted in the context of a generic (as opposed to discipline-specific) International Foundation Programme (IFP) delivered face-to-face at a British university (henceforth ‘University’) with its main campus in the South-East of England and two overseas campuses based in the United Arab Emirates (UAE) and Mauritius. The IFP was targeted at international students who intended to pursue undergraduate study at the University but did not meet the requirements for direct entry to the University’s degree programmes in terms of their

English language and/or academic qualifications. The required language level for the IFP was IELTS 5.5 overall with a minimum of 5.0 in each of the test's four components (comprising reading, writing, speaking and listening). Hence, the goal of the IFP was to prepare these students for university study by helping them develop a range of skills necessary for study at a degree level. The IFP was delivered over a period of approximately 6 months. On successful completion of the programme students could progress to a degree programme of their choice within the University, with the majority of the participants aspiring to progress onto Business, Law, Computer and Psychology courses.

In total, 193 students (110 female and 83 male) aged 16 - 26 ($M=19$, $SD=1.71$) across the University's three campuses provided written informed consent to participate in the study between 2014 - 2018. The largest proportion of the participants (113 students, i.e., 58.5%) was formed by the UAE-based students. The Mauritius-based students accounted for less than a third of the participants (55 students, i.e., 28.5%) with the UK-based students representing the smallest proportion (25 students, i.e., 13%). It is noteworthy that the vast majority of the participants were not permanent residents in their place of study; the students typically arrived in order to attend the IFP during term-time (i.e., 24 teaching weeks over 6 months) and left after its completion.

The students came from various linguistic backgrounds representing 55 different languages as their first language. The range of language backgrounds represented in this study lends itself to the exploration of intergroup homogeneity, referring to similarities among L2 writers irrespective of their linguistic backgrounds, which can give insights into language features inclusive to L2 writers as a composite. Adopting this approach can provide evidence that some aspects of L2 writing may be related to the students' level of proficiency or language experience rather than being cultural or independent (Crossley & McNamara, 2011). The intergroup homogeneity approach to the investigation of student writing is seen as relevant to this study due to the participants' similar level of proficiency and their status as novice writers, that is students who are new to academic setting and often lack prior experience with and exposure to the type of writing they are required to produce in university contexts (Tribble & Wingate, 2013).

Data

This study explores textual data in the form of summative written assignments completed by individual students on the IFP. These assignments were submitted approximately within four weeks of each other (in months 3, 4, 5 and 6 of the 6-month programme) and were completed by the participants outside of class time after receiving training on each genre with regard to its structure and social purpose. In order to meet the objectives of the programme (i.e., to help students develop the skills deemed necessary for successful university study), the students were encouraged to draw on external sources during the writing process.

The collected assignments were classified in accordance with Nesi and Gardner's (2012) taxonomy of university student writing comprising 13 genre families (i.e., Exercise, Explanation, Essay, Critique, Literature Survey, Methodology Recount, Research Report, Case Study, Design Specification, Problem Question, Proposal, Empathy Writing, Narrative Recount). Their classification scheme has been adopted in this study as it offers a comprehensive categorisation of university writing genres based on relatively recent British university student assessed academic writing. Accordingly, the assignments were classified as Essays (comprising finer-grained genres of Exposition and Discussion Essays), Problem Questions and Research Reports. An overview of the textual data is provided in Table 1.

Table 1. Overview of collected assignments.

Assignments & Writing genre	Sub-corpus (topic)	No. of texts	Size (tokens)	Average length (tokens)	Average length (SD)
Assignment 1:	Learning styles	42	33,789	800	96
Exposition	Multiple intelligences	38	35,326	900	218
Essays	Fake news	113	77,163	700	57
Assignment 2:	Business organisational structure	48	80,957	1,700	356
Problem	Ethics in social psychology	73	118,907	1,600	175
Questions	Sustainable tourism	59	110,660	1,900	368
	Sustainable initiatives	13	21,605	1,700	99
Assignment 3:	Barriers to sustainability	193	348,779	1,800	534
Research Reports					
Assignment 4:	Social media and crime	42	55,815	1,300	152
Discussion	Social media for academic purposes	38	51,355	1,300	256
Essays	Surveillance society	113	132,991	1,200	262

The Exposition Essays with a social purpose of employing critical thinking skills and demonstrating the ability to construct a coherent argument displayed a ‘thesis – evidence – restatement of thesis’ structure staged as introduction, series of arguments and conclusion (Nesi & Gardner, 2012). In this essay, students focused on one of the following three topics: their learning style and how it related to the characteristics of the learner types identified in Kolb’s theory; the theory of multiple intelligences and how it related to learning with reference to Gardner’s theory of intelligence; fake news where students were required to discuss whether fake news is harmful. The Problem Questions provided practice in applying specific methods in response to professional problems with a ‘situation / context - problem - solution – evaluation’ structure (Nesi & Gardner, 2012). This assignment represented topics common in specific fields of study, reflected in the various titles (Table 1). In this assignment, students followed the stages of this genre starting with a problem scenario followed by application of relevant arguments leading to possible solutions. The Research Report aimed to develop the students’ ability to conduct research with a typical ‘Introduction - Method - Results - Discussion’ structure (Nesi & Gardner, 2012), and required students to write a report on preventing barriers to sustainability with a focus on a sustainable development initiative selected by individual students (e.g., wind turbines, recycling, pollution reduction, or solar energy). The Discussion Essay displayed an ‘issue - alternative arguments - final position’ structure, which required the inclusion of alternative positions relating to the issue under discussion before reaching a position based on the evidence discussed (Nesi & Gardner, 2012). In this assignment, students focused on the topic of social media and discussed whether it

encourages crime, or they discussed social media in relation to academic purposes, specifically whether students' usage of online social networking for academic purposes has a beneficial or detrimental effect on their experience at university. Another topic of discussion was the benefits and detriments of a surveillance society.

The collected assignments form a collection (i.e., a corpus) of IFP student writing comprising 772 texts (i.e., four assignments from each of the 193 participants) totalling 1,067,347 running words (tokens) sub-divided into several sub-corpora representing a range of topics (Table 1). It is noteworthy that the different writing genres are not of the same length, as shown in Table 1, where the average assignment length corresponds to the word limit students were set as a guide for each assignment.

Procedure

The academic vocabulary items were first identified using the new Academic Vocabulary List (AVL) (Gardner & Davies, 2014). The AVL was selected over the other academic word lists presently available (i.e., AWL, AKL, NAWL) for several reasons: it can be considered an advance on the Academic Word List (AWL) in terms of the source corpus size, representativeness of disciplines as well as currency; it was chosen over the Academic Keyword List (AKL) primarily due to the AKL's relative small source corpus and inclusion of fewer disciplines; the New Academic Word List (NAWL) was not considered as insufficient information has been made available regarding the methodological procedures followed for its compilation (Therova, 2020).

Due to the AVL's organising principle based on lemmas (i.e., all inflectional forms related to one stem belonging to the same part of speech), the collected texts were lemmatised first using TagAnt (Anthony, 2015), which is a freely accessible Part-Of-Speech (POS) tagger. Although being primarily used for POS tagging, this tool enabled the extraction of the base forms (lemmas) of the words in the collected students' assignments. This was followed by identification of academic vocabulary utilising AntWordProfiler (Anthony, 2013), which is a freeware tool for profiling the vocabulary level and complexity of texts. The suitability of this freeware for this study lies in its ability to analyse the entire corpus at once as well as in batches. Although by default this tool analyses texts on the basis of the AWL, it is possible to upload alternative word lists, such as the AVL selected for this study. A further advantage is in the tool's output, which records the percentage of the academic vocabulary types (unique academic words) and tokens (all academic words) identified on the basis of the selected academic word list uploaded to the tool. The output can conveniently be saved in an Excel spreadsheet, which enables further customised sorting and other relevant operations. It should be noted that in the present study, academic types refer to the different academic lemmas as opposed to "a unique word form" (Brezina, 2018, p. 39) belonging to the same stem. This is because the academic vocabulary items were identified using lemmatised texts, which did not contain inflected word forms. The analysis was approached from the perspective of the identified academic vocabulary types used by at least 50% of students with the aim of gaining insights into the size of the academic vocabulary items shared by the majority of students, referring to 'core academic vocabulary' in this study.

Since university students are often required to produce various writing genres during the course of their degree study, it is important to not only know what academic vocabulary to prioritise based on their frequency of occurrence in these genres, but also to focus on the function that these vocabulary items display in the various genres. Hence, the core academic vocabulary items identified across the four writing genres investigated in the present study were further explored in their contextual environments to gain additional insights into their characteristics.

Specifically, the core academic vocabulary items were explored for their functions in their co-textual environment drawing on Hyland's (2008) functional categories of academic clusters, which were also found suitable for classification of individual academic vocabulary items in the current study. These categories are: *text-oriented* (referring to discourse organisers) containing resultative, transition, structuring and framing signals; *participant-oriented* (focusing on the reader or writer of the text) including stance and engagement features; and *research-oriented* (describing the writers' activities and experiences of the real world) subdivided into topic, location, description, procedure, and quantification. For a clearer presentation, abbreviated codes of the functional categories are used (Table 2).

Table 2. Academic vocabulary functional categories.

Function	Code	Function	Code
Research-oriented:	RO	Text-oriented:	TO
location	RO-loc	transition	TO-trans
procedure	RO-proc	resultative	TO-res
description	RO-desc	structuring	TO-str
topic	RO-top	framing	TO-fram

These functional categories were assigned to the vocabulary items utilising the concordancing programme AntConc (Anthony, 2018), which enabled assessment of the items' functions and meanings in their co-textual environment. In order to ensure an accurate classification of the functional categories, the functions of the academic vocabulary were assessed twice at a two-month interval with the raw agreement ranging between 81.08% - 95% for the three Exposition Essays; 91.78% - 98.18% for the four Problem Question assignments; 100% for the Research Reports; and 93.55% - 100% for the Discussion Essays. This can be considered acceptable since an agreement of 80% and above is desirable (Brezina, 2018).

In this study, research-oriented location items referred to places (e.g., *university*), procedure items were mainly action words (e.g., *act, develop, conduct*), description items were primarily adjectives or nouns providing more specific information about the item under discussion (e.g., *individual, global, important*), and topic vocabulary items were closely related to the assignment topic and often contained in the assignment title (e.g., *sustainable, barrier, organisation*); text-oriented transition signals referred to vocabulary items expressing additive or contrastive links (e.g., *however, furthermore*), resultative items expressed causative relationships (e.g., *therefore, hence, thus*), framing items specified limiting conditions (e.g., *both, within*), and structuring items were academic vocabulary organising stretches of discourse or had the function of directing the reader elsewhere in the text (e.g., *firstly, finally, above*) and were also used to classify headings / sub-headings (e.g., *introduction, literature review*) as well as vocabulary used as signposts (e.g., *aim, state, purpose*,) and referring to Tables and Figures. It is important to note that academic vocabulary items occurring across the different sub-corpora of the same writing genre were counted once only. It is also noteworthy that no research-oriented quantification or participant-oriented vocabulary items were identified among the core academic vocabulary, potentially due to the genres investigated.

Findings and Discussion

Core academic vocabulary

Table 3 below provides an overview of the distribution of the core academic vocabulary items deployed by the majority of the students across the four writing genres under investigation as well as the distribution of these vocabulary items within the sub-corpora forming the writing genres.

Table 3. Core academic vocabulary.

Writing genre	Sub-corpus (topic)	No. of ac. vocab.	% of ac. vocab.
Exposition Essays	Learning styles	30	3.86%
	Multiple intelligences	32	4.56%
	Fake news	20	2.29%
		58 (82-24)	M=3.57%
Problem Questions	Business organisational structure	73	7.1%
	Ethics in social psychology	55	5.27%
	Sustainable tourism	95	8.32%
	Sustainable initiatives	81	15.31%
	155 (304-149)	M=9.00%	
Research Reports	Barriers to sustainability	66	4.18%
Discussion Essays	Social media and crime	45	5.12%
	Social media for academic purposes	70	8.23%
	Surveillance society	29	2.45%
		89 (144-55)	M=5.27%

Table 3 shows that the core academic vocabulary ranged from 2.29% (in Exposition Essays on Fake news) to 15.31% (in Problem Questions on Sustainable initiatives). On average, the core academic vocabulary ranged between 58 - 155 academic vocabulary items in the four writing genres (with academic words occurring across different sub-corpora of the same genre counted once only), accounting for approximately 3.6% - 9% of academic vocabulary types across the genres. This finding, thus, shows that in all writing genres there was a relatively small set of core academic vocabulary in the students' writing as follows: 58 academic vocabulary types in Exposition Essays (with 24 academic vocabulary items used in more than one of the three sub-corpora); 155 academic vocabulary types used in the Problem Question assignments (with 149 academic vocabulary items used in more than one of the four sub-corpora); 66 academic vocabulary types in Research Reports; and 89 academic vocabulary types in Discussion Essays (with 55 academic vocabulary items used in more than one of the three sub-corpora). It is noteworthy that a small number of academic vocabulary items (i.e., 16 out of the 368 core academic vocabulary items) were found to be common to all four genres (further discussed below).

It can also be seen from Table 3 that the Problem Question assignments generated the highest proportion of core academic vocabulary (M=9%) compared to Exposition Essays (M=3.57%), Research Reports (4.18%) and Discussion Essays (M=5.27%). In other words, there was a higher number of academic vocabulary types deployed by the majority of students in this genre than in the other writing genres. This result is in line with Csomay and Prades's (2018) findings, which showed that some text types (i.e., writing genres) produced by students displayed a considerably higher percentage of academic vocabulary than others. Their analysis showed that these differences were due to the rhetorical purposes of different genres which have a strong impact on the amount of academic vocabulary used in student writing. This result, thus, underlines the importance of following a genre-based approach to academic vocabulary teaching.

Several core academic vocabulary items were found to be particularly prevalent across the different assignments, outlined in Table 4 providing an overview of the academic vocabulary items used by all students across the different tasks.

Table 4. Core academic vocabulary used by all students.

Writing genre	Sub-corpus (topic)	Acad. vocab used by all students
Exposition Essays	Learning styles	<i>experience</i>
	Multiple intelligences	-
	Fake news	-
Problem Questions	Business organisational structure	<i>literature, review</i>
	Ethics in social psychology	<i>ethical</i>
	Sustainable tourism	<i>sustainable, environment, literature, review</i>
	Sustainable initiatives	<i>literature, review, introduction, conclusion, initiative, reduce, barrier, future, implementation</i>
Research Reports	Barriers to sustainability	<i>literature, review</i>
Discussion Essays	Social media and crime	<i>social</i>
	Social media for academic purposes	<i>social, use</i>
	Surveillance society	-

Table 4 shows that the core academic vocabulary items used by all students across the different assignment tasks relate either to the assignment topic (e.g., *ethical, sustainable*) or reflect the structure or the particular writing genre (e.g., *literature, review*). This points to the various functions that these core academic vocabulary items display in various genres, further explored next.

Core academic vocabulary function

Drawing on Hyland's (2008) functional categories of academic clusters, the core academic vocabulary items were further explored in their co-textual environment from the perspective of their function in order to gain additional insights into the characteristics of these core

vocabulary items. Table 5 provides a summary of the functional categories of the identified core academic vocabulary across the four writing genres under investigation.

Table 5. Core academic vocabulary functions

Function	Exposition Essays	Problem Questions	Research Reports	Discussion Essays
RO-top	24 (41.38%)	28 (18.06%)	5 (7.58%)	20 (22.47%)
RO-proc	14 (24.14%)	52 (33.55%)	22 (33.33%)	30 (33.71%)
RO-desc	8 (13.79%)	48 (30.97%)	19 (28.79%)	22 (24.72%)
RO-loc	1 (1.72%)	1 (0.65%)	-	1 (1.12%)
RO total	47 (81.03%)	129 (83.23%)	46 (69.7%)	73 (82.02%)
TO-struc	6 (10.34%)	14 (9.03%)	15 (22.73%)	7 (7.87%)
TO-res	2 (3.45%)	4 (2.58%)	1 (1.52)	3 (3.37%)
TO-trans	2 (3.45%)	3 (1.94%)	2 (3.03%)	3 (3.37%)
TO-fram	1 (1.72%)	5 (3.23%)	2 (3.03%)	3 (3.37%)
TO total	11 (18.96%)	26 (16.78%)	20 (30.31%)	20 (30.31%)

The analysis of the function displayed by the core academic vocabulary (Table 5) shows the impact of the topic in the Exposition Essays, where approximately 41% of the core academic vocabulary types related to the assignment topic (e.g., *structure, organisation, sustainability, social, barrier*). A possible explanation for this might be the social purpose of this writing genre to “develop the ability to construct a coherent argument” (Gardner & Nesi, 2013, p. 38) and the ‘thesis - evidence - thesis restatement’ structure characteristic of this writing genre requiring a series of arguments providing evidence to support the thesis and to argue for the stated position from the outset, which may have prompted repeated references to the topic under discussion in all parts of the assignment (without an inclusion of alternative arguments). The impact of the topic on vocabulary deployment is in line with Olinghouse and Wilson's (2013) finding showing that students consider the topic when selecting vocabulary to integrate in their writing as the topic knowledge is one of the “knowledge bases students access to select appropriate words while composing written text” (p. 59).

The topic-effect was least prevalent in the Research Reports. A closer reading of the reports showed that although they related to the general topic of barriers to sustainability, they focused on a range of more specific issues (e.g., recycling or pollution), likely resulting in a smaller number of academic vocabulary items relating to the general topic of the report. Problem Questions and Discussion Essays also contained a smaller proportion of research-oriented topic academic vocabulary items than Exposition Essays. This may be explained by the fact that the Problem Question assignments aim to “provide practice in applying specific methods in response to professional problems” (Nesi & Gardner, 2012, p. 41), which required the usage of vocabulary relating to the procedures involved in these methods. This would explain the higher proportion of research-oriented procedure academic vocabulary types than topic academic vocabulary in this writing genre. As for Discussion Essays, the lower proportion of topic academic vocabulary compared to Exposition Essays likely resulted from the writing genre’s

requirement to include alternative arguments and positions, which may not have required the usage of academic vocabulary directly related to the topic under discussion.

As for research-oriented procedure academic vocabulary, despite approximately the same proportion of these items in Problem Questions, Research Reports and Discussion Essays, a closer inspection of these vocabulary items revealed that in Discussion Essays the vast majority of the research-oriented procedure academic vocabulary items were found to be more general (e.g., *enable, provide, act, communicate, change*). In contrast, in Problem Questions and Research Reports several of these items related to the methodological aspects common in these two writing genres (e.g., *research, conduct, participate, observe, analyse*). This is due to the purpose of Problem Questions to give practice in the application of specific methods and the structure of Research Reports (i.e., Introduction-Method-Results-Discussion) characterised by an entire section focusing on the description of methods. This result, thus, highlights the crucial role that the social purposes and structure of the writing genres played in the characteristics (i.e., functions) of the core academic vocabulary deployed by the majority of students.

Further differences were found in the usage of text-oriented structuring academic vocabulary, which were most frequently deployed in Research Reports (e.g., *abstract, introduction, result, finding, discussion, conclusion, graph, figure*) likely due to the structure of this writing genre requiring the use of headings, figures and graphs (which were among the most frequent text-oriented structuring vocabulary items).

However, similarities in the usage of core academic vocabulary across the four genres under investigation are also important to note. An analysis of the core academic vocabulary items identified across the four genres showed that 16 academic vocabulary items were common to all four text types. These include the following academic vocabulary items: *affect, conclusion, develop, discuss, discussion, furthermore, group, identify, impact, information, process, result, social, state, study, therefore*. Out of these, 15 vocabulary items belonged to the same functional category across the genres. The exception was *discussion*, which displayed the function of a research-oriented procedure academic vocabulary in the Exposition and Discussion Essays, and carried a topic-oriented structuring function in the Problem Question and Research Report assignments.

Despite the small number of core academic vocabulary items found in all four assignment types, the writing genre was found to play an important role in the deployment of academic vocabulary used by the majority of students across the four writing genres investigated in this study. Specifically, the social purposes of the genres impacted the characteristics (i.e., function) of the core academic vocabulary. This result is in line with previous studies which showed that academic vocabulary is genre-specific in learner writing and that differences exist in academic vocabulary usage across writing genres of learner writing (e.g., Csomay & Prades, 2018; Durrant, 2016; Olinghouse & Wilson, 2013).

Csomay and Prades (2018) found that some writing genres produced by students displayed a considerably higher percentage of academic words than others, which they argue provides “evidence that academic vocabulary is text type specific in student writing” (Csomay & Prades, 2018, p. 114). However, Durrant (2016) shows that a genre is not as large a factor impacting the usage of academic vocabulary items as discipline. Due to the generic nature of the IFP investigated in the present study, it is difficult to corroborate Durrant’s (2016) findings. Nevertheless, since the writing genre of Problem Questions focused on a range of topics reflecting different subject areas (e.g., psychology or business, as outlined in Table 1), the findings generated by this writing genre can be regarded as representative of different disciplines and thus as suitable for comparative purposes. Considering that significant

differences were found among the four titles of the Problem Question assignments, it can be said that in the case of Problem Questions, the discipline (represented by the various topics in this study) played a more significant role in the deployment of academic vocabulary than the writing genre. This finding would, therefore, be in line with Durrant's (2016) finding that discipline is a greater driver of variation than genre. However, it contradicts Csomay and Prades's (2018) findings that genre and rhetorical purpose play a more significant role in academic vocabulary usage than topic in student writing.

Conclusion

This study set out to investigate the usage of academic vocabulary in four genres of assessed academic writing (i.e., Exposition and Discussion Essays, Problem Questions, and Research Reports) produced by novice student writers at one UK university with the aim of exploring core academic vocabulary deployed by the majority of international foundation-level students and the function of these vocabulary items in the various writing genres.

The findings showed that there was a relatively small core of productive academic vocabulary types deployed by at least half of the students across the writing genres, which ranged from an average of 3.57% of core academic vocabulary in Exposition Essays to 9% of core academic vocabulary identified in Problem Questions. This relatively small core of productive academic vocabulary highlights the need for novice student writers to expand their repertoire of academic vocabulary deployed in their written production. Since one of the most challenging aspects of vocabulary learning and teaching in EAP contexts relates to making principled decisions with regard to the selection of words worth focusing on (Coxhead, 2000), EAP instructors involved in the delivery of IFP programmes ought to draw learners' attention to such academic vocabulary items that occur with high frequencies in the various writing genres that the students are expected to produce in their specific academic contexts. As the general principle of prioritising words based on frequency of occurrence continues to be widely accepted (Durrant, 2016), such core academic vocabulary should be a priority in an EAP classroom due to the limited time that students attending EAP courses often have for acquisition of academic vocabulary and its mastery in written production. The rationale for this is two-fold: first, the majority of learners will only master a small fraction of the words in the target language; second, not all words are of equal importance for successful communication (Durrant, 2014). Therefore, it is important for EAP practitioners to prioritise a core of academic vocabulary items in order to broaden learners' academic vocabulary, whereby equipping them with a set of words that will enable them to communicate successfully in their written production in academic settings.

The results also highlighted the different functions that the core academic vocabulary items displayed across genres with research-oriented topic vocabulary found to be most prevalent in the Exposition Essays, while research-oriented procedure academic vocabulary used in Problem Questions and Research Reports related to the methodological aspects characteristic of these genres. The structure of the Research Report also prompted a higher usage of text-oriented structuring academic vocabulary corresponding to the use of headings, figures and graphs commonly found in this genre. These findings show that academic vocabulary is genre-specific in learner writing and likely results from the social purposes of the writing genres. EAP practitioners should, therefore, follow a text-type specific or genre-based approach to academic vocabulary teaching (Csomay & Prades, 2018). In practice, this means that there should be an explicit focus on the features of the relevant writing genres that the students are required to produce (Nesi & Gardner, 2012) and the impact that the genres have on vocabulary choices in student written production (Csomay & Prades, 2018; Durrant, 2016; Olinghouse & Wilson,

2013). Specifically, since vocabulary items ought to be prioritised based on their frequency of occurrence (Durrant, 2016), novice student writers' attention should first and foremost be drawn to such academic lexical items which characterise different writing genres.

Further, given the various academic contexts of novice student writers, the approach to the teaching of academic vocabulary should also be contextualised and specific to the students' academic needs as the writing genres favoured by the students' disciplines may vary. Hence, in addition to a focus on genre-specific academic vocabulary, there is a need for teaching academic vocabulary pertinent in the students' disciplines (Csomay & Prades, 2018). However, there is a case for prioritising academic vocabulary to discipline-specific words, which is supported by the argument that although discipline-specific vocabulary items are difficult for EAP practitioners to deal with as they are often outside of their competence, they are relatively unproblematic for learners (Farrell, 1990). In addition, due to a current trend towards interdisciplinarity, students are increasingly required to engage with content from various disciplines (de Chazal, 2012). Therefore, defining a set of target core academic vocabulary items useful for EAP learners' written production should be a priority of EAP practitioners.

Despite these potentially important pedagogical implications, several limitations of the present study need to be acknowledged. First, out of the 13 most common genre families of assessed academic writing typically produced at UK universities (Nesi & Gardner, 2012), this study's findings are based on four writing genres representing three genre families only (i.e., Essays, Problem Questions and Research Reports). Another potential weakness relates to drawing on a pre-existing list of academic vocabulary, potentially resulting in an omission of other vocabulary items that may have formed the core vocabulary deployed by the majority of the students in this study. It was also not possible to assess to what extent students received help with their written assignments since the collected textual samples were not produced in a controlled environment.

Considering the impact of the genre on the usage of academic vocabulary in student writing, further research would benefit from exploration of core academic vocabulary in other genres of assessed academic writing typically produced at universities (e.g., Case Study, Proposal, Literature Survey or Proposal) (Nesi & Gardner, 2012), and the characteristics that academic vocabulary items display in these different genres of student writing. This would provide further understandings of genre-specific vocabulary in student writing. Investigating the students' writing processes as they engage with the texts or the various resources they utilise in the process of completing their written assignments would also provide valuable insights into student written production. Other factors potentially impacting novice students' productive knowledge of academic worth exploring include cognitive processes, their level of integration, motivation, teaching practices or literacies outside university contexts. Useful insights could also be gained from exploring the influence of students' prior experiences and educational backgrounds on their writing practices. Such research would provide further insights into the factors that play a vital role in the student written production.

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