

The Use of Lexical Bundles in English Language Academic Writing among University Learners: A Systematic Literature Review

Chen Dan¹, Ramiza Haji Darmi¹ & Mohamad Ateff MD Yusof¹

¹ Faculty of Modern Languages and Communication, Universiti Putra Malaysia, Selangor, Malaysia

Correspondence: Ramiza Haji Darmi, Department of English, Faculty of Modern Languages and Communication, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia. E-mail: ramiza@upm.edu.my

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Abstract

Lexical bundles have been widely studied in English academic writing, but not as extensive in university learners' academic writing. This study conducted a systematic review of the literature on lexical bundles in academic writing among university learners from 2017 to 2022 to describe the directions of and limitations of recent studies on how lexical bundles influence the fluency and coherence of academic writing among university learners. The review relied on two major databases, Scopus and Web of Science, and adhered to the PRISMA 2020 guidelines. The study analyzed 28 articles them based on three content-based themes: the research context, the research contents, and the research objectives. Recent research on lexical bundles in academic writing among university students 1) lacks an in-depth analysis of specific functions, such as text-oriented bundles, which predominate and play an important coherence role in more advanced academic writing; 2) addressing the analysis of lexical bundles solely through a phraseological lens fails to account for their genre-specific characteristics. It is crucial to merge insights from both genre and phraseology for a thorough analysis; 3) comparing the academic writing of native English-speaking learners, that of university learners in East Asia and the Middle East are unevenly distributed and limited in scope. There is limited research on academic writing at higher academic levels, university learners in Southeast Asia, and cross-regional comparative studies.

Keywords: Lexical Bundles, Academic Writing, University Learners

1. Introduction

Successful academic writers are recognized for their ability to choose exact vocabulary, logically link ideas, and express thoughts coherently as reported by researchers like Chen (2015), Wingate (2018), Jiang (2020), and Simpson (2017). Challenges in writing pointed out by these researchers include forming coherent paragraphs, using appropriate lexical expressions, and coherently and effectively utilizing academic language. Wang (2017), Paltridge (2020) and Kashiha (2022) point out that insufficient writing skills, especially in creating coherent and cohesive texts, negatively influences academic writing and its publication.

Biber (2011) and Hyland (2008) describe lexical bundles, which are commonly found in written academic discourse, as crucial for effective academic writing. Hyland (2008) categorized lexical bundles into three types: research-oriented bundles, text-oriented bundles, and participant-oriented bundles. Research-oriented bundles assist in structuring real-world activities and experiences, for examples, 'the use of' and 'the structure of'. Next, text-oriented bundles mark textual organization and construct discourse, convey logical relations, and promote discourse coherence and cohesion. Examples of text-oriented bundles include 'on the basis of' and 'on the other hand'. Participant-oriented bundles focus on the writer or reader; examples of participant-oriented bundles include 'are likely to be' and 'it is possible that'. Loghmani et al. (2020) recommend that thesis writers effectively use interpersonal language resources to express authorial stances, engage with alternative positions, and connect with academic communities. Producing authentic academic texts requires proficiency in the typical lexical bundles of a writer's field (Singh, 2019; Lu, 2019; Lyu, 2019). There has been a growing interest in lexical bundles in recent years. These studies primarily investigated the influence of lexical bundles using registers (Biber & Ponpoon, 2011; Biber, 2009), genres (Bestgenand & Granger, 2021; Shahmoradi, 2021), historical changes (Hyland & Jiang, 2018; Candarli, 2021), first English language writers (Esfandiari & Barbary, 2017; Pan et al., 2020), language proficiency (Chen & Baker, 2016; Li, 2021), L2 English writers (e.g., Pan et al., 2016; Bychkovska & Lee, 2017), and disciplines (Lu & Deng, 2019; Ackerley, 2017; Qin, 2014; Cui, 2022). The results of these studies, that yielded numerous language data, have improved the understanding and usage of lexical bundles in academic writing. But there has been no attempt to systematically study lexical bundles and their discourse function in university learners' academic writing. This study conducted a systematic literature review (SLR) of recent literature that covered a variety of research topics on the use of lexical bundles in academic writing by university learners using a critical, thorough, and multifaceted process.

SLR is a comprehensive research approach that methodologically and objectively collects, evaluates, and synthesizes published literature in an exhaustive and transparent procedure of searching, screening, selecting, and examining all related studies (Paré et al. 2015). Its rigorous process allows future scholars and writers to refer to the study, verify its interpretation or test its comprehensiveness, and expand

new literature based on it. The guiding questions for this SLR were:

RQ1: What is the focus of recent research on the lexical bundles in English language academic writing among university learners from the different themes?

RQ2: What gaps exist in the literature on the use of lexical bundles in English language academic writing among university learners?

2. Method

SLR is a thorough and methodical examination of existing texts using prominent databases such as Web of Science, Scopus and Science Direct.

2.1 Resources

The first step in SLR is selecting electronic library databases. Two primary electronic library databases namely Web of Science (WoS) and Scopus were selected for literature retrieval in this study. The selected libraries were chosen because they are the leading index databases in academia with advanced search capabilities and excellent article quality.

2.2 Systematic Review Process

2.2.1 Identification

Relevant keywords to retrieve articles from the selected databases were then identified. The keywords were lexical bundles and academic writing. To enrich these keywords, the main author identified their synonyms and related terms, including formulaic expressions, formulaic phrases, lexical phrases, recurrent formulaic expressions, multi-word expressions, prefabricated chunks, academic writing, and academic genre. Combinations of these keywords are usually processed using search functions in the two selected primary electronic databases: Scopus and Web of Science (WoS). A total of 668 articles were retrieved from the two databases during the preliminary search process (see Table 1).

Table 1. Search strings used to retrieve articles from the selected database

Databases	String
Scopus	TITLE-ABS-KEY (“lexical bundle*” OR “formulaic expression*” OR “formulaic phras*” OR “lexical phras*” OR “recurrent formula*” OR “multi-word expression*” OR “prefabricated chunk*”) AND (“academic writing” OR “academic genre”)
Web of Science	TITLE-ABS-KEY (“lexical bundle*” OR “formulaic expression*” OR “formulaic phras*” OR “lexical phras*” OR “recurrent formula*” OR “multi-word expression*” OR “prefabricated chunk*”) AND (“academic writing” OR “academic genre”)

2.2.2 Screening

The screening process entailed the selection of the all the retrieved article using study inclusion and exclusion criteria that were based on the research questions. The study was limited recent literature (to articles published between 2017 and 2022) of high quality (articles published in journal articles reporting empirical data) in the English language publications (due to the unavailability of a translator) focused on social science and art humanities research studies among university learners.

Table 2. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Publication year	2017-2022	2016 and earlier
Document types	Articles with empirical data	Review articles, book chapters, conference processing, etc
Language	English	non-English
Subject area	Social Science Arts and Humanities	Other non-Social Science and non-Arts and Humanities
Research Fields	Linguistics, Language Learning	Non-Linguistics, Language learning
Subjects of study	University learners	Children, high school students

2.2.3 Eligibility

The third phase in systematic review process requires the researchers to validate the retrieved articles based on their titles. If the title cannot affirm the article’s validity, researchers then read the article’s abstract. If researchers are still uncertain on the eligibility of an article, then they should read the entire article. In Figure 1, 668 documents were retrieved from Web of Science (607) and Scopus (61) databases based on the search strings. After a review of the title and abstract of the 668 articles, 562 articles were excluded because 231 studies focused on research articles, 145 documents that did not study English writing, 59 studies focused on lexical chunks in spoken language, 32 studies were on children and adolescents, 27 studies were conducted on lexical bundles in teaching, and 10 documents related to listening and reading leaving a total of 106 documents for further assessment. After reading full-texts of the remaining 106 articles, 30 articles were excluded because the research did not involve structural and functional analysis, a further 31 articles were excluded because they explored discontinuous sequence bundles in writing, 19 diachronic studies were excluded because they focused on lexical bundles in writing, and 13 articles were excluded because they were about lexical bundles’ density leaving 28 articles for inclusion in the final analysis. A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) flow-chart by Page et al. (2020) depicts the different phases the systematic review conducted in this study (See Figure 1).

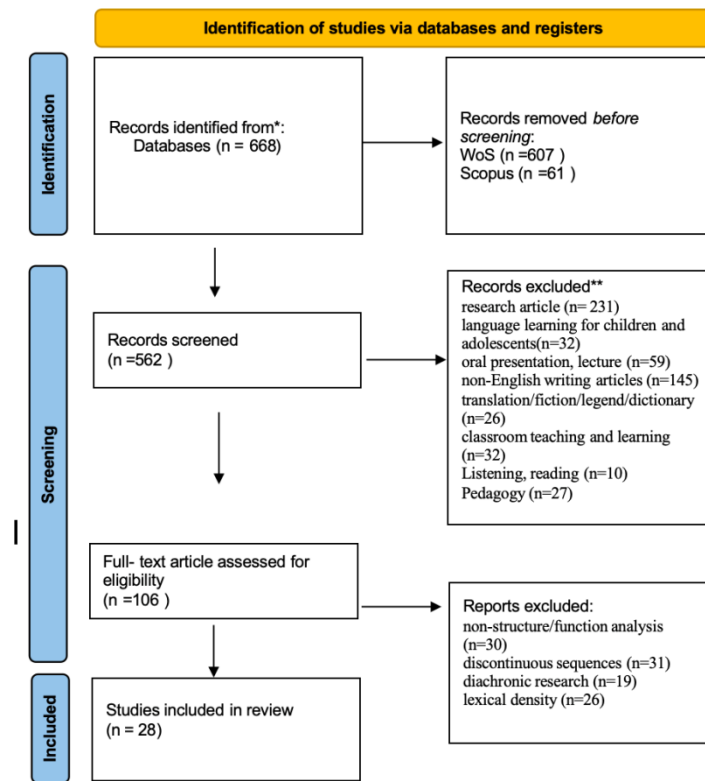


Figure 1. Conducting a SLR search based on PRISMA 2020 (Page et al., 2020)

2.2.4 Coding Framework

In this study, a literature review matrix analysis described by Dr. Gary Burkholder (2010) from Walden University’s writing centre, was employed to comprehensively categorize the selected articles using the following dimensions: (1) research aims; (2) research genres; (3) research sub-genres; (4) research disciplines; (5) research methodologies; (6) research corpus; and (7) countries where the research studies were conducted.

3. Results

3.1 Publication Years

Of the 28 articles included in the final analysis, ten articles were published in 2022 (Sanosi, 2022; Faqih, 2022; Nateethorn, 2022; Abbas, 2022; Cui, 2022; Kim, 2022; Ren, 2021; Bao, 2022; Randy, 2022; Oktavianti, 2022), seven articles were published in 2021 (Dincă, 2021; Hamdallah, 2021; Zhang, 2021; Ilyas, 2021; Papangkorn, 2021; Nasser, 2021; Li, 2021), five articles were published in 2017 (Ruan, 2017; Yang, 2017; Durrant, 2017; Bychkovska, 2017; Nam, 2017), three articles were published in 2019 (Shin, 2019; Lu, 2019; Vo, 2019), two articles were published in 2018 (Yousaf, 2018; Sugiarti, 2018), and one article was published in 2020 (Randy, 2020).

Figure 2 depicts the year of publication of reviewed articles. There was an increasing interest in, or development of lexical bundle studies by year possibly due to the following reasons: 1. Advances in corpus linguistics technology and tools which have made it easier for researchers to efficiently analyze large collections and identify and study lexical bundles, and 2. The crucial role lexical bundles play in discourse analysis, a process during which researchers investigate how language is used to convey meaning in specific discipline. These factors have fueled the expansion of lexical bundle research leading to a better understanding of how language functions in real-world contexts.

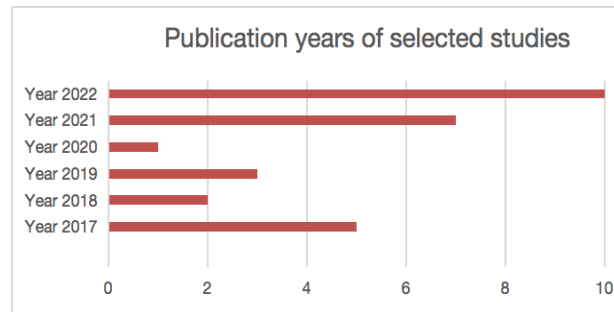


Figure 2. Year of publication years of selected articles

3.2 Research Contextual Dimensions

3.2.1 Countries Where Research Studies Were Conducted

Eleven of the 28 articles selected were conducted in China (Bao, 2022; Ren, 2022; Kim, 2022; Li, 2022; Zhang, 2021; Randy, 2020; Vo, 2019; Lu, 2019; Bychkovska, 2017; Ruan, 2017; Yang, 2017), four were conducted in Korea (Cui, 2022; Vo, 2019; Shin, 2019; Nam, 2017), four were conducted in Iran (Sanosi, 2022; Abbas, 2022; Nasser, 2021; Randy, 2020), three were conducted in Indonesia (Mohamad, 2022; Oktavianti, 2022; Sugiarti, 2018), there were conducted in Thailand (Nateethorn, 2022; Papangkorn, 2021; Durrant, 2017), while one research study was conducted in each of the following countries; Romania (Dinca, 2021), Turkey (Ilyas, 2019), Japan (Randy, 2022), Saudi Arabia (Hamdallah, 2021), and Brazil (Vo.S, 2019).

Research involving L1 and L2 languages was done by three studies in the US and China (Bychkovska, 2017; Lu, 2019; Bao, 2022), three studies in Thailand and the US (Nateethorn, 2022; Papangkorn, 2022; Durrant, 2017), two studies in Korea and the US (Nam, 2017; Shin, 2019), two studies Iran and the US (Abbas, 2022; Nasser, 2021), one study in China and British (Ren, 2022), and one study in Turkey and the US (Yakut, 2021). Two studies were conducted in different L 1 backgrounds: one study was conducted in China, Iran, and France (Randy, 2020), while the other was conducted in China, India, Brazil, and Korea (Vo. S, 2019) (see Table. 3).

Table 3. Research contextual dimension- country

Country/Region	No.	Studies
Japan	1	Randy, A (2022)
Korea	4	Cui (2022), Vo.S (2019), Shin (2019), Nam (2019)
Iran	4	Sanosi (2022), Abbas (2022), Nasser (2021),
Thailand	3	Nateethorn (2022), Papangkorn (2021), Durrant (2017)
Indonesia	3	Mohamad (2022), Oktavianti (2022), Sugiarti (2018)
Romania	1	Dinca (2021)
Turkey	1	Ilyas (2021)
Saudi	1	Hamdallah (2021)
Pakistani	1	Yousaf (2018)
China	11	Kim (2022), Li (2021), Zhang (2021), Ruan (2017), Yang (2017), Randy,A (2020), Lu.X (2019), Bychkovska (2017), Bao (2022), Kim (2022), Ren (2022)
French	1	Randy,A (2020)
Brazil	1	Vo.S (2019)
India	1	Vo.S (2019)

First, the research on lexical bundles in English written by Chinese university learners were primarily comparative studies between Chinese students and native English speakers in the UK (Ren, 2022) and the USA (Bao, 2022; Bychkovska, 2017). There was also a focus on Chinese undergraduates, mainly students majoring in English (Zhang, 2021; Ruan, 2017; Yang, 2017). In the 21st century, there was an increasing interest in research on lexical bundles in academic writing in educational research (Zhang, 2021). Technological advances, particularly in corpus analysis, have enhanced the study on lexical bundles. Researchers routinely use large corpora to identify and analyze commonly used collocations and their applications in different writing genres to cultivate the talents the nation needs (Liu, 2022). Secondly, Iran and Korea contributed to 12.1% of the articles on this subject, respectively. The research on Iran includes a comparative study of lexical bundle usage in argumentative essays by university students from China, Iran, and France, and research on master's academic writing. The research on Korea includes a comparative study between Korea and the US and different non-English native learners.

3.2.2 Disciplines of studies

Research on lexical bundles are mainly classified into the following disciplines' categories : (1) single discipline, (2) interdisciplinary, (3) intradisciplinary, and (4) other perspectives that includes studies that do not specific their disciplinary contexts. They primarily examine lexical bundles in L2 writing or conduct comparative analyses of lexical bundles in L1 and L2 writing. With reference to Figure 3, the most frequent category was 'Single Discipline' (n=11, 39%), indicating that most of the research was concentrated within specific, individual academic disciplines highlighting a strong interest in understanding how lexical bundles function within the confines of particular academic fields. There were six studies in the interdisciplinary category where the research compared lexical bundle usage by

university learners across different disciplines. The intradisciplinary category had the lowest number of studies (n=2, 7%) that explored the use of lexical bundles within different subfields or specializations of the same discipline. However, it was challenging to describe how lexical bundles are employed within various branches of a single academic discipline from only these two studies.

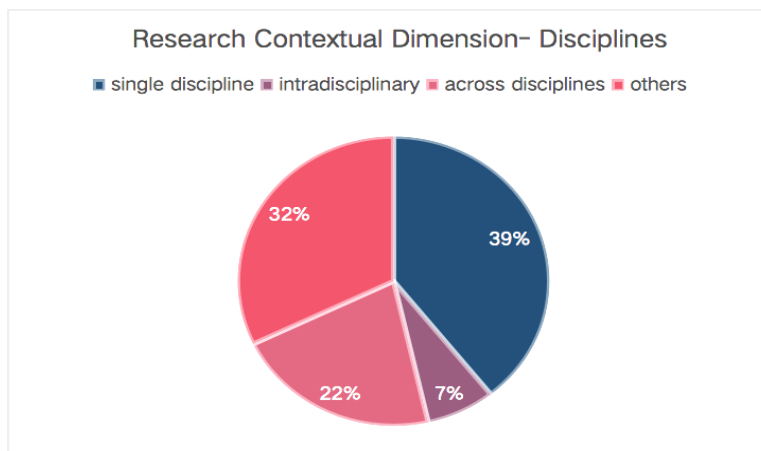


Figure 3. Research Contextual Dimension- Disciplines

3.3 Research Content Dimensions

3.3.1 Genres

Each genre of academic writing distinctly demonstrates the use of lexical bundles. Table 5 illustrates most studies (n=15) evaluated undergraduate theses, while the remainder assessed Master theses (n=7) and PhD thesis (n=6). PhD thesis were investigated in 2018 (n=1), 2019 (n=1), 2021 (n=1) and 2022 (n=3). Relatively fewer studies on Masters and PhD thesis may mean that the genre is used less often in academic writing or that this area is under-researched. It also demonstrates a lack of awareness of the importance of lexical bundles in advanced academic writing.

Table 4. Research Content Dimension -Genre

Types of genres	No. of Studies	Percentage (%)
Undergraduate' essay	15	53.5
Master' thesis	7	25.0
PhD thesis	6	21.5

3.3.2 Sub-genres

Different sub-genres have their own characteristics in academic writing. The sub-genres of the 28 selected articles are mainly divided into three categories: full text, abstract, results and discussion. The results in Table 5 show that most articles were full-length article research (78.5%) and included all lexical bundle research based on undergraduate argumentative essays. Fewer studies were on lexical bundles in abstracts (n=4), understandably given the brevity of abstracts and their role in summarizing the main points of an article. The results and conclusion sections were less frequently encountered (n=2). Among the lexical bundle studies based on the master's thesis, there were 3 studies on full-length articles, 2 studies on the results and discussion sections, and 2 studies on the abstract sections. The lexical bundles for the PhD thesis included four studies on full-length articles and two studies on abstracts. None of the 28 selected articles focused on other sub-genres, such as the introduction, the literature review, and the methodology within the academic writing genre.

Table 5. Research Content Dimension- Sub-genres

Types of sub-genres	No. of Studies	Percentage (%)
Full-length article (22)	Undergraduate' essay	15
	Master' thesis	3
	PhD thesis	4
Abstract (4)	Master' thesis	2
	PhD thesis	2
Result & Discussion (2)	PhD thesis	2

3.3.3 Objectives

Research on lexical bundles in academic writing mainly focuses on their roles and usage. Most (21) of the 28 selected studies on lexical bundles in academic writing examined the function and structure category. The 6 studies focused on the "functional" category exclusively analyzed in detail, the distribution of the three functional uses of lexical bundles and the role they play in texts (Nam, 2017; Durrant, 2017; Yang, 2017; Dincă, 2021; Li, 2021; Oktavianti, 2022). One study focused on "participant-oriented bundles" in undergraduate argumentative essays (Papangkor, 2021). Another single study only focused on the distribution and use of different structures of lexical

bundles in undergraduate argumentative essays (Appel, 2022). Therefore, current research underestimates or ignores the specific functional characteristics of lexical bundles and the role played by lexical bundles.

Table 6. Research Content Dimension-Objective

Different objective of lexical bundles	Frequency	Percentage (%)
Functions & Structures	20	71.4
Functions	6	21.4
Structures	1	3.6
Participant-oriented bundles	1	3.6

3.3.4 Corpus

The research corpus discussed in this section refers to the different lengths of lexical bundles in the corpus; the length of a bundle determines its prevalence and diversity (Hyland, 2018).

Table 7. Research content dimension- corpus

Length	No.	Studies
4-word bundles	20	Sanosi (2022), Ren (2022), Abbas (2022), Cui (2022), Nateethorn (2022), Mohamad (2022), Li (2021), Ilyas (2021), Hamdallah (2021), Zhang (2021), Randy(2020),Vo.S(2019),Lu(2019),Shin(2019),Sugiarti(2018), Nam (2017), Bychkovska (2017), Durrant (2017), Ruan (2017), Yang (2017)
5-word bundles	1	Yousaf (2018)
3-4 word bundles	2	Bao(2022), Papangkorn(2021),
3-5 word bundles	3	Kim(2022), Oktavianti (2022), Nasserri (2021),
4-5 word bundles	1	Dinca(2021)
3-7 word bundles	1	Randy(2022)

Table 7 provides insights into the evolving types and preferences of lexical bundle length in academic writing. In recent years, the frequency of 4-word bundles has generally shown a stable characteristic ranging from 5 studies in 2017 to 6 studies in 2022. The 3–4-word bundles appeared less frequently, with only 1 study in 2021 and 1 study 20022. The 3–5-word bundles were observed in 3 studies published in 2021 (1) and 2022 (2). But 3–7-word bundles and 4-5 5-word bundles were rare; each was seen in one study only. The 4-word bundles are increasingly popular suggesting their dominance and significance in academic writing. The longer bundles (3-6, 4-5, 3-7 words) were scarce indicating a preference study for shorter, more concise bundles in academic writing. The presence of longer bundles in the later years, though still rare, might indicate an emerging trend or a shifting preference in academic writing styles.

4. Discussion

4.1 Research Gaps in the Current Literature on the Use of Lexical Bundles in Academic Writing among University Learners

First, comparative research on the function and structure of lexical bundles is yet to meet the requirements of fluent academic writing. Most research has focused on the brief comparison of the structure and function of lexical bundles. A functional distribution of the present study’s findings shows that there is a larger proportion of text-oriented bundles in most non-native writing (Sanosi,2022; Bao, 2022; Ren, 2022; Kim, 2022; Cui, 2022; Abbas, 2022; Li, 2021; Nasserri, 2021; Zhang, 2021; Lu, 2019; Sugiarti, 2018; Mohamad, 2018; Durrant, 2017). Furthermore, this limitation is more obvious in higher level learners. Lu (2019), Mohamad (2018), Nateethorn, Bao, and Cui (2022) all found that text-oriented bundles in PhD thesis writing have the highest frequency of use; a finding is consistent with the research by Qin (2014) that shows a direct relationship between the level of the learner and the use of text-oriented bundles and researcher-oriented bundles. Text-oriented bundles in academic writing make the article logical, coherent, and cohesive (Biber, 2009). Academic writing follows a certain rhetorical tradition that emphasizes argumentation, logical flow, and clear articulation of ideas. Text-oriented bundles fit neatly into this tradition, serving as tools for constructing persuasive and logical arguments (Wang, 2019). The more demanding academic writing is, the more it involves complex ideas and arguments, so coherence ensures that these ideas are presented in a clear, logical way and that these elements are connected in a logical order, building a structured and persuasive argument that makes it easier for readers to understand academic viewpoints. In addition, the coherence of writing reflects a writer’s ability to think logically and organize the thoughts clearly; an ability that is key to establishing credibility and professionalism in the academic community (Salazar, 2014). However, Hadizadeh (2022) and Cui (2021) noted that text-oriented bundles (such as master’s and doctoral theses) are underutilized in student writing, despite the higher academic stakes and the uneven quality of these genres. Very few studies have focused on the use of text-oriented bundles (Wang, 2017; Wang, 2019). But making such a conclusion about PhD academic thesis writing obviously does not comply with the traditional rhetorical rules of the academic community and reflects the inattention paid to this feature in advanced academic research. The various studies on lexical bundles in this study signifies how text-oriented bundles influence academic writing. Future studies should extensively explore how text-oriented bundles could further enhance fluency in writing in higher academic fields, especially PhD thesis.

Second, future studies could look at the effects of different lengths of text-oriented bundles on advanced academic fluent writing. The majority (71%) of studies focused on the 4-word bundles. The underrepresentation of longer lexical bundles (more than 4- words) suggests a gap in the understanding or utilization of these types of bundles in academic writing. Each word bundle with different lengths has its own structural and functional identities in different contexts (Peyman, 2020). Furthermore, the length of a lexical bundle is an

important aspect in linguistic analysis and understanding language use (Cortes, 2014). Longer lexical bundles may be more stable and context-specific, while shorter bundles might be more flexible and adaptable across different contexts (Hyland, 2018). The potential utility and characteristics of longer text-oriented bundles are not fully explored or understood, and it is unclear how they might differ in function and what effect different lengths of text-oriented bundles has on advanced academic fluent writing.

Third, for fluently written doctoral dissertations, it is lopsided to only consider text-oriented bundles of different lengths and different functions. Fareed (2016) posited that there's a lot more to writing than a genre, but there is no writing without genre. Based on the CARS model by Swale (1990), the different sections in academic writing called sub-genres, have different structure that and play a vital role in comprehensively developing and presenting the research (Swales, 2009; Friginal, 2017). These models help conventionally describe research designs and guide novice writers in drafting research articles. However, these 28 selected studies contain many studies on lexical bundles in full-length texts (Sanosi, 2022; Randy, 2022; Ren, 2022; Kim, 2022; Cui, 2022), and fewer studies on lexical bundles in abstracts (Bao, 2022; Nasser, 2021; Lu, 2019; Yang, 2017) and conclusions (Mohamad, 2022; Shahmoradi, 2021; Sugiarti, 2018). Among the six studies in the PhD students' thesis genre, four were studies on lexical bundles in full-length texts, two were studies on lexical bundles in the abstract section, and all were comparative studies on the structure and function of lexical bundles.

PhD theses, which are longer and more complex than other writing genres, mark the pinnacle of doctoral research (Soler, 2011). As a high-stakes genre of academic writing, PhD thesis writing represents original research contributions to a particular field (Hyland, 2018). Among the prominent sub-genres of PhD theses, the introduction section, a complex section to write, plays a key role in justifying the significance and originality of the research (Bhatia 1993; Bunton, 2002; Kawase, 2018). Although most PhD students will participate in thesis writing courses or seminars at the beginning of their study, they still face challenges in thesis writing from the research proposal phase to and completion of the preliminary draft, particularly when drafting the introduction chapter. In addition to innovative points and research questions, the poor logic of the language is also very obvious, and there are challenges in readability (Hassan, 2015; Zhang, 2022). Sukan (2022) claims that many PhD candidates face enormous challenges in conforming to genre-specific writing conventions. Kawase (2018) and Aitchison (2012) presented that it is difficult for PhD candidates to write the various parts of a PhD if they do not understand the rhetorical devices of each part. Therefore, writers need to recognize the nature of academic written texts, the discourse and interpersonal functions of the English language, how grammar and vocabulary are used, as well as rhetorical conventions in constructing texts (Cortes, 2013; Geng, 2023). However, there has been little research on the combination of rhetorical moves and text-oriented bundles in the introduction section of PhD theses. Therefore, future research should combine text-oriented bundles with rhetorical moves to improve PhD students' effectiveness and fluency in writing the introduction sections of their theses.

Fourthly, judging from the disciplinary comparisons in the previous chapter, research focused on diverse disciplines, and only two studies (Nasser, 2021; Sanosi, 2022) conducted intradisciplinary research. Therefore, future researchers should undertake intradisciplinary research, for instance delving into the importance of intra-disciplinary differences in high-stakes academic writing to clarify how each discipline constructs and transmits knowledge and for a more nuanced understanding of academic language and its use in closely related disciplinary contexts.

4.2 Generalization of Findings to Other Contexts

The 28 selected studies focused predominantly on Asian locations such as China, South Korea, Iran, and Indonesia raising questions about the broader applicability of the study finding to different linguistic and educational contexts. Therefore, Future research should investigate the academic writing of university learners from diverse educational systems. Moreover, variations in academic writing skills based on the specific educational and linguistic environments in each country may have influence the fluency and accuracy of a student's written work. PhD training in Malaysia aims to strengthen the higher educational sector, promote research and innovation, and contribute to the country's economic and social development. But the university has also attracts many international students as it advances its mission to cultivate doctoral graduates with deep professional knowledge and aims to enhance the global standing and diversity of its higher education institutions (Malaysia Education Blueprint 2013-2025). Currently, no research has been done on PhD thesis writing in the Malaysian context. Hence, future research on text-oriented bundles in Malaysian PhD thesis introductions is needed.

5. Conclusion

This study comprehensively examined prior research on using lexical bundles in academic writing by university learners. It reviews the literature in the field from 2017-2022 with its systematic approach, and the selection process involves selecting 28 literature reviews from the Web of Science and Scopus databases, focusing on three themes: research contextual, content, and methods. This review not only reveals the current state of lexical bundle research but also identifies potential areas for future research, such as the function of text-oriented bundles, academic genres and sub-genres, the varying lengths of lexical bundles, and intradisciplinary research within the field.

The present study had some limitations. Firstly, only two databases (Scopus and the Web of Science) were used suggesting that including works from other databases may have broadened its scope. Secondly, it was restricted to articles published in English thereby excluding potentially valuable research published in other languages. Thirdly, the study focused only on the English for Specific Purposes (ESP) field, future research should delve into this topic from other angles, such as phraseology and psycholinguistics.

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Authors contributions

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Data sharing statement

No additional data are available.

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Appendix A

Author	Date	Title	Corpus	Aims	Findings	genre	Sub-genre	Country
Sanosi, A.B.	2022	The Use and Development of Lexical Bundles in Arab EFL Writing: A Corpus-Driven Study	250000 words from Arab postgraduates thesis	addressed the difference among frequency, function, and structure of 4-word LBs in applied linguistics and TESOL in Iranian Master's Thesis	stance LBs are more frequent in the native corpus and more VP-based clausal LBs.	Master thesis	Full-length article	Iran
Appel, R.	2022	Lexical bundles in L2 English academic texts: Relationships with holistic assessments of writing quality	L1 Japanese undergraduate students' course assignments	investigates how L2 English learners make use of 3-7-word LBs in undergraduate essay.	functional classifications revealed only minor differences between writer groups	Undergraduate essay	Full-length article	Japan
Bao, K	2022	A Corpus Study of Lexical Bundles Used Differently in Dissertations Abstracts Produced by Chinese and American PhD Students of Linguistics	1400 abstracts produced by Chinese and American PhD students	exploring of 3- 4 word LBs used differently by Chinese and American PhD students of linguistics in their dissertation abstracts.	the greatest number of BUDs occurred in the text-oriented category, followed by the research- and participant-oriented categories.	PhD thesis	Abstract	China vs US
Ren, J.Q.	2022	A comparative study of the phrase frames used in the essays of native and non-native English students	503,682 words, and 467,879 words in the NS and NNS corpus	identified and compared the 4-word LBs used by Chinese and British undergraduate argumentative essays	more participant- and research-oriented LBs were used by the NSs, while more text-oriented LBs were used by the NNSs.	Undergraduate essay	Full-length article	China vs British
Kim, S	2022	Examining L2 English University students' uses of lexical bundles and their relationship to writing quality	120 argumentative essays selected in China's College English Test	addressing the function and structure of 3-5 word LBs produced in the academic writing	the use of longer bundles may make sense with learners. The bundles distinct to the high-scoring group included stances bundles and text-oriented bundles.	Undergraduate essay	Full-length article	China
Cui	2022	Structural and functional differences between bundles of different lengths: A corpus-driven study	90 doctoral dissertations in English education downloaded from ProQuest	identify and analyze 3-5 word LBs in structure and function of 100 most frequent in Korea PhD theses	4-and 5word bundles differ significantly in text- and participant-oriented bundles.	PhD thesis	Full-length article	Korea n
Abbas, H.	2022	Lexical Bundles and Disciplinary Variation in Master Theses	120 master theses of Iran university	examined the frequency, functions, and structure of 4-word LBs used in US and Iranian master theses	text-oriented bundles in L2 texts is functionally superior to L1 texts and also has interdisciplinary features	Master thesis	Full-length article	Iran
Nateethorn.	2022	Lexical	1,000,000	examined 4-word	Thai writers	PhD thesis	Full-length	Thaila

N		bundles in native English speakers' and Thai writers' dissertations	words from dissertations in the field of the English Language	LBs between US and Thai English Language Teaching	overused LBs in comparison with that of L1 writers in each part of the dissertations, especially the Results and Discussion section		article	nd
Faqih, M. S	2022	English Lexical Bundles in The Graduate Theses: The Frequency, Structure and Distribution	74 different theses compiled to create the corpus	identifies the most frequent, structure, and function categorization of 4-word LBs in the Findings and Discussion section of Indonesia Master TESOL Theses	research-oriented bundles were the most frequent ones followed by text-oriented and the least frequent bundles were participant-oriented.	Master thesis	Result & Discussion	Indonesia
Oktavianti	2022	Discourse Functions of Lexical Bundles in Indonesian EFL Learners' Argumentative Essays: A Corpus Study	169 argumentative essays written by English major students in Indonesia	explored functional categories of 3-, 4-, and 5-word LBs in Indonesia English major undergraduate essays	research-oriented bundles are the most frequent bundles in the corpus, while text-oriented bundles are the least frequent.	Undergraduate essay	Full-length article	Indonesia
LI, M	2021	Exploring lexical bundles in low proficiency level L2 learners' English writing: an ETS corpus study	1,330 essays with 11 different L1 backgrounds	to investigate the quantity, function, and quality of four-word lexical bundles produced by low proficiency L2 English writers	The use is more of stance expression and discourse organizer, while the use of referential expression is less.	Undergraduate essay	Full-length article	China
Nasseri, M.	2021	Lexical density and diversity in dissertation abstracts: Revisiting English L1 vs. L2 text differences	210 MA dissertation abstracts of Iran postgraduates	Investigated 3 and 5-word LBs density and diversity differences in US and Iran linguistics master's theses	EFL group produced more discourse organizers, but the less lexically dense and diverse, particularly the 3- and 5-word bundles.	Master thesis	Abstract	Iran
Papangkorn	2021	A Comparative Study of Stance and Engagement Used by English and Thai Speakers in English Argumentative Essays	Native corpus with 321 texts, THAI corpus with 613 texts	Analyze 3- and 4-word participant-oriented bundles used in English argumentative essays	stance resources were used more often in THAI. The differences in the frequencies of attitude markers between the two corpora were significant.	Undergraduate essay	Full-length article	Thailand
Dincă, A.	2021	Assessing learners' academic phraseology in the digital age: A corpus-informed approach to esp texts	40 texts representing a specific didactic genre-essay	investigates the use of 4- and 5-grams in Romanian students' academic papers	the IT students used considerably more content-related LBs and discourse-organizer compared to the Literature Studies students	Undergraduate essay	Full-length article	Romania
Ilyas, Y.	2021	Lexical bundles in L1 and L2 English	127 Phd dissertations in L1 and L2	Explores the overall usages of 4-word LBs occurring	L2 writers use more text-oriented and research-oriented	PhD thesis	Full-length article	Turkey vs US

		doctoral dissertations		in doctoral dissertations produced between 2010-2019 in L1 and L2	functions than that in L1.			
Zhang, S.J.	2021	Understanding the sustainable growth of EFL students' writing skills: Differences between novice writers and expert writers in their use of lexical bundles in academic writing	24 MA theses on linguistics from two prestigious Chinese universities	compare the use of 4- word LBs in MA students' writing and expert writing in terms of frequency and distribution.	Two groups show similar proportions, with text-oriented bundles constituting the most substantial proportion and participant-oriented ones the smallest proportion.	Master thesis	Full-length article	China
Hamdallah, A.A.	2021	Lexical Bundles in Saudi EFL Student Writing: A Study of Learner Corpus	534 essays covering four major essay genres	explore the function and structure of 4-word LBs in Saudi undergraduates' essays across 4 disciplines	a large number of participant-oriented bundles convey their attitudes toward the topics and readers.	Undergraduate essays	Full-length article	Saudi
Appel,R.	2020	L1 differences in L2 English academic writing: A lexical bundles analysis	the number of words in each corpus is 50 essays, approximately 30,000	explore the functional and structural features of 4-word bundles in Chinese, Iran, and French undergraduates' argumentative essays.	Chinese writers and French writers demonstrated more research-oriented LBs and Arabic writers underused the participant-oriented bundles.	Undergraduate essay	Full-length article	China, Iran, France
Vo,S.	2019	Use of lexical features in non-native academic writing	1388 writing from English Placement Test corpus	explored 4-word LBs in three levels in an English Placement Test corpus	noun phrase-based and verb phrase-based bundles with referential and stance functions were significantly found in lower-level responses.	Undergraduate essay	Full-length article	China, India, Brazil,& Korea
Lu, X.	2019	With the rapid development: A contrastive analysis of lexical bundles in dissertation abstracts by Chinese and L1 English doctoral students	13,596 and 4,755 abstracts of doctoral theses of L2 students from the Tsinghua and L1 from the MIT	compared the use of 4-word LBs in dissertation abstracts written by Chinese and L1 English doctoral students.	Chinese students used significantly more bundles in all three functional categories than L1 students. Text-oriented bundles accounted for two-thirds of the bundles used by corpora	PhD thesis	Abstract	China vs US
Shin, Y.K.	2019	Do native writers always have a head start over nonnative writers? The use of lexical bundles in college students' essays	500 argumentative essays from Korean and US college	examining 4-word LBs with comparable corpora of L1 and L2 novice academic writing	heavy use of VP-based bundles, stance-expression bundles, idiomatic PP bundles, and informal quantifying bundles	Undergraduate essay	Full-length article	Korea n vs US
Sugiarti, T. R.	2018	Lexical bundles in academic writing by	70 results and discussions sections of thesis	identify 4-word LBs in the result and discussion sections of English Language	The lexical bundles found in the result and discussion sections of master thesis merely	Master thesis	Result & Discussion	Indonesia

		undergraduate and graduate students of English Language Education Program		Education Skripsi and master thesis	function as text-oriented, especially resultative signals bundles.			
Muhammad, Y.	2018	Prevalence of Prefabricated Structures in Academic Discourse: A Corpus-Based Study	4.7 million words Pakistani PhD dissertations across three disciplines	explore 5-word LBs of PhD dissertations in the Pakistani context.	N-phrase structure and discourse organizers are the predominant features of PhD dissertations. The frequency of lexical bundles varies from discipline to discipline	PhD thesis	Full-length article	Pakistani
Bychkovska, T	2017	At the same time: Lexical bundles in L1 and L2 university student argumentative writing	101 high-rated essays written by L1-English students and 105 high-rated essays written by L1-Chinese students.	Compares 4-word LBs in US and Chinese undergraduate students' use of lexical bundles in English argumentative essays.	Chinese students use substantially more bundle types and tokens than US students, whereas US students use significantly more stance bundles than Chinese students.	Undergraduate essay	Full-length article	China vs US
Durrant, P.	2017	Lexical Bundles and Disciplinary Variation in University Students' Writing: Mapping the Territories	1,558 texts from 24 different disciplines	describes disciplinary variation in university students' writing, as it is reflected in the use of 4-word LBs.	Functional, text-oriented bundles nearly 40% of the total token in soft (humanities/social sciences) subjects.	Undergraduate essay	Full-length article	Thailand
Nam, D.	2017	Functional distribution of lexical bundle in native and non-native students' argumentative writing	829 essays consisting of 1.6 million words across 16 disciplines	investigates the functional distribution of 4-word LBs between the argumentative writing corpora contributed by Korean and American college students	stance bundles and discourse organizers are more frequently used in Korean students' argumentative writing, whereas American students' writing includes more referential expressions.	Undergraduate essay	Full-length article	Korea n vs US
Ruan, Z.	2017	Lexical Bundles in Chinese Undergraduate Academic Writing at an English Medium University	400 student academic texts written at four points between Year 1 and Year 4	investigates the use of 4-word LBs in Chinese undergraduate essays across different levels of studies	Discourse organizers were much more prevalent than stance and referential expressions.	Undergraduate essay	Full-length article	China
Yang, C.	2017	A Study on the Features of Lexical Bundles in Graduation Thesis Abstracts Written by Chinese English Majors	A corpus of 40 Chinese university students master theses of English major	made both a quantitative and a descriptive research on the structural and functional features of the 4-word LBs in CGTA.	functionally distributed mainly in research-oriented bundles yet are short of text-oriented and participator-oriented ones	Master thesis	Abstract	China