An Exploration of Key Phrase Frames in Business Management Discussions for EAP Teaching

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EN **Abstract:** The interest in the phraseological nature of language has generated numerous studies on phraseology in various genres. The current study focuses on key phrase frames in business management research article discussions. Key phrase frames are recurrent phraseological expressions with a variable slot and are specific to the studied context, such as genre or discipline. The analysis is based on a corpus of research article discussions extracted from six leading business management journals published between 2017 and 2021. Four-word phrase frames in the corpus were identified using the *KfNgram* program and refined based on exclusion criteria to generate a list of phrase frames that were then compared with the Corpus of Contemporary American English. This comparison yielded a total of 63 four-word key phrase frames in business management, which were analysed following Biber and Gray's (2013) structural classification and Simpson-Vlach and Ellis's (2010) functional taxonomy. In terms of structure, most key phrase frames were found to be non-verb content word frames, while functionally, most served referential discourse functions. The results suggest that phraseological variation in business management is associated with both lexical and grammatical constructions. These findings are crucial as they have implications for discipline-specific academic writing.

Keywords: phraseology; research article; key phrase frame; discipline-specific writing.

Contents: 1. Introduction. 2. Review of literature. 2.1. Language as phraseology. 2.2. Lexical bundles. 2.3. Phrase frames. 3. Corpus and methodology. 3.1. The corpus. 3.2. Procedure. 3.2.1. Identification of phrase frames. 3.2.2. Frequency and range criteria. 3.2.3. Identification of key phrase frames. 3.2.4. Structural and functional analysis of key phrase frames. 4. Results. 4.1. The most frequent key phrase frames. 4.2. Structural analysis. 4.3. Functional analysis. 5. Discussion, pedagogical implications and conclusion. 5.1. Discussion. 5.2. Pedagogical implications. 5.3. Conclusion. Acknowledgements. CREDiT authorship contribution. References. Appendix A.

1. Introduction

Research in the area of phraseology suggests that language is largely composed of semi-fixed or fixed multi-word expressions, and that the main carrier of meaning in a language (Coxhead, 2008; Römer, 2010; Wray, 2008). The terms used in the literature to refer to these multi-word expressions include "phraseological expressions", "formulaic sequences", "n-grams", "lexical bundles", "collocations", and "phrase frames" (Biber et al., 1999; Chen & Baker, 2014; He, Ang, & Tan, 2021; Lu et al., 2018; Wray, 2008), and they have been defined in different ways. Despite the varied terms and definitions, multi-word expressions have "an especially strong relationship with each other in creating their meaning" (Wray, 2008, p. 9). The current study uses the term "phraseological expressions" as an umbrella term for multi-word expressions of contiguous and non-contiguous types. Contiguous phraseological expressions include n-grams and lexical bundles (e.g., *the*

competitive effects of), collocations (e.g., "adjective + noun" such as *empirical study*) while non-contiguous expressions are phrase frames [e.g., *play a * role* (* = *determining/significant/crucial*)].

Phraseology plays a crucial role in distinguishing socially-situated practices (Biber et al., 1999; Biber et al., 2004). Therefore, the appropriate and adequate use of such multi-word expressions is not only seen as an indicator of language proficiency (Coxhead, 2008; Wray, 2008), but also a recognition of writing expertise and discourse community membership (Salazar, 2014). Academic discourse, in particular, draws heavily on phraseological expressions (Hyland, 2008a, 2008b) and has received significant research interest, with most studies concentrating on contiguous phraseological expressions, such as lexical bundles and collocations in various academic genres and registers. These phraseological forms have been found useful (Biber et al., 1999; Conklin & Schmitt, 2012; Erman & Warren, 2000), as users can draw upon them in various written and spoken contexts. In addition to identifying the phraseological forms, researchers have also examined the structural and functional properties of the relevant phraseology. For instance, Biber et al. (2004) devised a general taxonomy that encompasses the functions of four-word lexical bundles identified from classroom teaching and textbook corpora. According to their taxonomy, lexical bundles can be classified as discourse organisers, stance expressions, or referential expressions. Discourse organisers introduce a topic (e.g., *in the next section*) or clarify a topic by providing further explanations (e.g., *has to do with*). Stance bundles pertain to the epistemic status of information (e.g., *can be considered as*) or the expression of attitude/modality (e.g., *it should be noted*). Referential bundles highlight an entity for further description (e.g., *is one of the*) or emphasise certain attributes of an entity (e.g., *in the context of*). Biber et al.'s (2004) functional taxonomy has been adopted by other researchers (e.g., Cortes 2006, Cortes 2013) and adapted by some authors (e.g., Simpson-Vlach & Ellis 2010; Adel & Erman 2012). A noteworthy adaptation of Biber et al.'s functional taxonomy was made by Simpson-Vlach and Ellis (2010), who developed an empirically derived and pedagogically useful list of lexical bundles called the *Academic Formulas List* (AFL).

While there has been extensive research in the phraseology of English for Academic Purposes (EAP), the emphasis has been on contiguous fixed expressions and their usefulness. The over-dependence on this form may cause expressions with variations, which are crucial to providing a complete picture of phraseology in academic discourse and the extent to which language allows for variations, to be overlooked (Römer, 2010; Vincent, 2013; Wang, 2019). This concern has prompted research (e.g., Cunningham, 2017; Golparvar & Barabadi, 2020; Lu et al., 2018, 2021) to examine non-contiguous phraseological expressions, i.e., phrase frames. Phrase frames are recurrent phraseological expressions with a variable slot (Römer, 2010). For instance, the phrase frame *about the * of* contains a variable slot which could be filled by slot fillers such as *effectiveness*, *role*, and *risk*. Phrase frames are potentially useful in pedagogical contexts due to their variable characteristics (Lu et al., 2018).

Despite the crucial role of phrase frames in EAP, questions concerning phrase frames in academic genres still remain, as phrase frames in different academic registers and genres are under-researched, particularly in various sections of research articles. Phrase frames are useful constructions that help characterise "the functional patterns and constructions of different academic genres" (O'Donnell et al., 2013, p. 84). In order to teach academic writing effectively, holistic knowledge of a genre should be supplemented by knowledge of the specific language associated with each part-genre, i.e., different sections of research articles (Casal et al., 2021; Cortes, 2013). This corresponds with the theory of lexical priming (Hoey, 2005). The phenomenon of lexical priming is evident in phraseology research, as certain academic phrases are 'primed' to occur in specific sections of journal articles (Lu et al., 2018).

Given that different sections of a text prioritise various phrase frames, it is possible to gain insight into phrase frames specific to a particular genre or part-genre. As each part-genre serves different communicative functions and varies in linguistic and rhetorical choices (Parkinson 2011; Swales, 1990), part-genres in research articles merit more research attention. Le and Harrington (2015) and Swales and Feak (2012) highlighted that the discussion section in research articles is a part-genre that needs more research attention, as it is where writers discuss and interpret their research findings and highlight their research implications in theory and practice. Thus, the discussion section was given the focus in this study due to its salient role in research articles that will contribute to a better understanding of the existing and new body of knowledge on the topic of the study. The focus on part-genre was also motivated by the theory of lexical priming (Hoey, 2005) that projects priming as a ubiquitous phenomenon in academic discourse. Writing the discussion section is more challenging in business management, as extant EAP research has paid little attention to academic writing in business discourse (Bargiela-Chiappini & Zhang, 2013; Starfield, 2016). Given the prominent role of English in both local and international business contexts, the mastery of commonly used multi-word expressions such as phrase frames will "bolster transferability of information, knowledge, and expertise" (Piekkari, 2009, p. 271). Findings from descriptive and interpretive linguistic research relevant to business management contexts are therefore much needed to inform EAP instruction in this area (Nickerson, 2005, 2010; Starfield, 2016). Preparing a list of key phrase frames for the discussion section of research articles in business management is an attempt to address the gap related to the under-researched non-contiguous phraseology and the perceived pedagogical usefulness of these phraseological items for EAP students and instructors. Given this gap, the current study set out to derive key phrase frames in the discussion section of business management research articles. To this end, the study employs the keyness concept to phrase frames in identifying key phrase frames specific to business management research article discussions. The main objective is to develop a useful list of key phrase frames and the relevant slot fillers in discipline-specific reference materials that are pedagogically applicable (Đurović et al., 2021; Golparvar & Barabadi, 2020; Le & Harrington, 2015; Römer, 2010).

2. Review of literature

2.1. Language as phraseology

Phraseology studies date back to Firth (1957), who introduced the concept of "collocation" and stated, "you shall know a word by the company it keeps" (p. 11). This sparked research in collocational meaning (Sinclair, 1991) and lexical phrases (Nattinger & DeCarrico, 2008), leading to the contemporary view of "language as phraseology" (Hunston, 2002, p. 137). Phraseology facilitates communication and cognitive processing by making language more predictable. While idiomatic expressions exist, semantically transparent and regular phraseological expressions are more common. Sinclair (1991) suggests that language use involves common words in common patterns, forming multi-word patterns that create meaning in context. Due to the pervasiveness and usefulness of these expressions, researchers (e.g., Ädel & Erman, 2012; Biber et al., 1999; Dahunsi & Ewata, 2022; Durrant, 2017; Shirazizadeh & Amirfazlian, 2021; Sinclair, 2004; Wang, 2019) advocated for increased pedagogic focus on recurrent uninterrupted word sequences, called lexical bundles.

2.2. Lexical bundles

Lexical bundles, contiguous sequences of words that function as single multi-word units in texts, are rooted in corpus-driven language views and emphasised for recurring, lexicalised, and memory-based language use (Biber et al. 1999; Biber et. al. 2004; Pawley & Syder, 1983). They appear across various text types for different purposes, such as discourse organisation, functional use, and precise information transfer in technical fields such as aviation management and medicine (Schmitt, 2010). Researchers have employed corpus-driven approach to investigate the types, structural, and functional features of lexical bundles using frequency cut-offs and dispersion rates, as well as integrating teacher insights for pedagogical applications (Alasmary, 2019; Altenberg, 1998; Biber et al., 1999; Chen & Baker, 2014; Conklin & Schmitt, 2012; Hyland, 2008b). Lexical bundles are significant for language acquisition and socio-functional aspects, aligning with linguistic theories like the idiom principle (Sinclair, 1991), pattern grammar (Hunston & Francis, 2000), and lexical priming (Hoey, 2005).

Lexical bundles exhibit different phraseological uses across registers, genres, and disciplines. Biber and Barbieri's (2007) study found that lexical bundles are more prevalent in spoken university registers, expressing stance and discourse-organizing functions. Research also reveals that lexical bundles behave differently across genres. For example, Shirazizadeh and Amirfazlian (2021) found that while some lexical bundles were common, others varied significantly among theses, research articles, and textbooks in applied linguistics, challenging both wide and specific approaches to English for Academic Purposes (EAP). Furthermore, lexical bundles serve as markers of different disciplines. Cortes (2004) compared biology and history, discovering that biology used a wider range of lexical bundle structures, while history focused on prepositional and noun phrases. Reppen and Olson (2020) found that over 80% of lexical bundles appeared in only one or two of the nine examined disciplines, with only nine shared across all disciplines. These findings demonstrate that bundles are indicators of different registers, genres, and disciplines.

Research into phraseological expressions highlights the importance of phraseology in academic settings (e.g., Chon & Shin, 2013; Durrant, 2009; Siyanova-Chanturia & Schmitt, 2008; Webb & Kagimoto, 2009), leading to the creation of pedagogically useful lists of phraseological expressions for EAP pedagogy. These lists include the *Academic Collocation List* (ACL) (Ackermann & Chen, 2013), the *Academic Formulas List* (AFL) (Simpson-Vlach & Ellis, 2010), the *Academic English Collocation List* (AECL) (Lei & Liu, 2018), the *Multi-Word Construction list* (MWC list) (Liu, 2012), and *Phrasal Expressions List* (PHRASE list) (Martinez & Schmitt, 2012), developed using qualitative and quantitative methods, statistics, and human judgment. The AFL, which contains cross-disciplinary spoken and written lexical bundles, serves as a starting point for emphasising phraseological competence in EAP. However, its general and cross-disciplinary approach raises questions about its usefulness in addressing discipline-specific needs in academic writing. Additionally, although Simpson-Vlach and Ellis incorporated educator insights for methodological triangulation, only a small subset of their data was rated by EAP teachers, raising concerns about the measure's validity.

While research on lexical bundles and other phraseology offers insights into different disciplines, genres, and registers, these studies mainly focus on contiguous expressions. Less researched are non-contiguous phraseological expressions, originally called "collocational frameworks" (Renouf & Sinclair, 1991) and now known as "phrase frames" (Fletcher, 2022). These expressions, composed of conventional and variable elements, can provide a comprehensive understanding of language's phraseological behavior (Casal & Kessler, 2020; Cheng et al., 2009). Analysing phrase frames in terms of fixedness and variability reveals their productive use across contexts (Renouf & Sinclair, 1991). It is particularly crucial to examine phraseological tendencies in academic language to understand the fixedness of language patterns and the extent of variation (Forsyth, 2015; Römer, 2009, 2010). This aligns with Sinclair's idiom and open-choice principle (1991), viewing language patterns as semi-preconstructed phrases constituting single choices, analysable into segments. Phrase frames can be valuable in teaching EAP.

2.3. Phrase frames

Phrase frames are "sets of n-grams which are identical except for one word" (Römer, 2010, p. 98). Early studies on phrase frames focussed on pre-determined grammatical frames, i.e. the *collocation frameworks* proposed by Renouf and Sinclair (1991). These frameworks "consist of a non-contiguous sequence of two words, positioned at one word remove from each other... their well-formedness is dependent on what intervenes"

(Renouf & Sinclair, 1991, p. 128). Instances of the collocational frameworks include *a * of* and *many * of*, with the * being the slot filler for semantically related words. These collocational frameworks are pre-determined sets of grammatical frames used to study phraseological variation before the availability of *KfNgram* (Fletcher 2022) program which allows for automatic retrieval of frames of various sorts. *KfNgram* has made corpus-driven approach possible in studying non-contiguous phraseological sequences and the relevant phraseological variation in the form of phrase frames.

Phrase frames are useful as a unit of analysis for a number of reasons. Examining phrase frames, their slot fillers, and their pattern predictability and variability can reveal how these non-contiguous phraseological expressions are used productively across various contexts (Lu et al., 2021; Renouf & Sinclair, 1991). For instance, the fillers of a particular phrase frame like *the * of the* which often include *context*, *effects* and *influence* are very common in academic writing as these fillers and the frame often serve as referential expressions. The acquisition of these phrase frames are pedagogically useful as learners are likely to gain knowledge of "how the language works and what expectation certain linguistic forms bring" (Cunningham, 2017, p. 73), thus facilitating the understanding of the communicative purposes of texts in academic discourse. This helps language users to differentiate between common, useful phrase frames and the rare ones (Golparvar & Barabadi, 2020).

It has also been reported that academic discourse heavily relies on non-contiguous phraseological sequences allowing variability (Biber, 2009; Gray & Biber, 2013). Recent research (Hunston & Su, 2019; Liu & Lu, 2020) highlights the importance of larger constructions, like those in Pattern grammar, as potential realisations of phrase frames and variants in academic discourse. Similar to lexical bundles, phrase frames may indicate writers' competence levels and different genres (Römer, 2009; Win & Masada, 2015).

Phrase frames have gained research attention recently in academic genres (e.g., Biber, 2009; Casal & Kessler, 2020; Cunningham, 2017; Golparvar & Barabadi, 2020; Gray & Biber, 2013; Lu, et al., 2018, 2021; Römer, 2010). Römer (2009), for example, examined phrase frames in apprentice academic writing by non-native and native speakers of English and found that both groups developed their academic competence in similar ways, thus suggesting that native speakers also need to learn academic conventions. She argued that expertise, rather than nativeness, is a more important aspect in determining academic competence. Römer (2009) suggested that the specific use of certain phrase frames by expert writers should be given special attention in EAP courses. Win and Masada (2015) suggested using technical phrase frames in a particular genre as query phrases for conducting literature search as phrase frames can be useful for writers to sort out their target papers more effectively. In sum, phrase frames as unit of analysis are pedagogically and technically valuable and can be an integral part in establishing the phraseological profile of a text type (Römer, 2010).

The limited literature on phrase frames explores types, structures, functions, and variability based on genre and register. Biber (2009) compared academic prose and conversation, finding academic discourse relies on function word frames with content words filling variable slots, while conversational frames and fillers are mostly function words. Phraseology can indicate register, as language is a "complex construct" (p. 302) that can be analysed from different perspectives. This aligns with Renouf and Sinclair's (1991) collocational frameworks, which present various ways to explain language patterning (p. 143). Gray and Biber (2013) identified phraseological differences between academic prose and conversation, with function word frames more common in academic writing and verb-based frames more prevalent in conversation. Academic phrase frames are more varied than conversational ones, so productive frames can be distinguished by examining structures and variability. Gray and Biber (2013, p. 128) argued that academic phrase frames are "inherently linked to grammatical constructions".

In establishing a phraseological profile of book reviews, Römer (2010) claimed that the phraseological profile of a text type is central. It can help to determine "the extent of the phraseological tendency of [a] language", which provides "insight into meaning creation in the discourse" (Römer, 2010, p. 95-97). Grabowski (2015), in studying intra-disciplinary register variation in the pharmaceutical field found that the use, structures, and discourse functions of four-word phrase frames in academic textbooks, clinical trial protocols, product characteristics summaries and patient information leaflets varied significantly. Using genre-based approach, Cunningham (2017), Casal and Kessler (2020) and Yoon and Casal (2020) analysed the rhetorical functions of phrase frames, with Cunningham (2017) researching on mathematics research articles, Casal and Kessler (2020) analysing Fulbright grant application documents, and Yoon and Casal (2020) focusing on applied linguistics conference abstracts. Using the concept of keyness, Cunningham (2017) revealed that many key phrase frames correspond with specific rhetorical functions in mathematics research articles. Similarly, the majority of phrase frames in academic grant writing exhibit strong relationships with certain rhetorical functions (Casal & Kessler, 2020). In applied linguistics conference abstracts, most phrase frames are multi-functional (Yoon & Casal, 2020). This shows that academic writers vary their linguistic decisions at phraseological levels according to their rhetorical aims.

More recently, research on phrase frames has focused on part-genre approaches, examining different sections of research articles. Lu et al. (2018) classified five- and six-word phrase frames in social science article introductions into structural and functional groups, finding most five-word frames were non-verb content word frames with referential functions. Six-word frames were mostly verb-based, often serving as discourse organising markers. Golparvar and Barabadi (2020) analysed discussion sections in higher education articles, finding most key phrase frames were non-verb content word frames with referential functions. Lu et al. (2021) expanded on their previous work, matching phrase frames to rhetorical functions in social science

article introductions and classifying them into specialised, semi-specialised, and non-specialised types. Lu et al.'s focus on introductions highlights the need for research on other sections in research articles.

Past research has generated valuable insight into the phraseological use in different genres and registers, particularly, the need to "determine how meaning creation works" in part-genre "that shows a specialised grammar and vocabulary" (Römer, 2010, p. 96). An exploration of phrase frames in the discussion sections can provide a more comprehensive understanding of a part-genre. To this end, the current study aims to contribute to existing knowledge on phraseology in academic writing in generating a pedagogically useful list of key phrase frames for a specific part-genre, namely, the discussion section in business management research articles. The primary motivation behind the selection of business management is that firstly, according to Bargiela-Chiappini and Zhang (2013) and Starfield (2016), business management is still relatively insufficiently researched compared to other social sciences disciplines. Secondly, few if any studies have thus far focused on business management in close relation to academic phraseology. Thirdly, previous research has shown the disciplinary and part-genre differences in using phraseological expressions (e.g., Golparvar & Barabadi, 2020; Lu et al., 2018). The part-genre approach to describe the non-contiguous phraseological expressions may be pedagogically enlightening. Therefore, an exploration into business management would cast new light on the phraseological tendency of expressions in the relevant academic discourse.

Following Cunningham (2017), the concept of keyness is used in identifying key phrase frames through comparison with a reference corpus. In this study, key phrase frames refer to phrase frames that are specific to the context, i.e. the discussions in business management research articles.

In light of the preceding explanations, this study aims to answer the following research questions:

1. What are the frequent four-word key phrase frames present in the discussion section of business management research articles?
2. How are these four-word key phrase frames distributed across the structural categories?
3. How are these four-word key phrase frames distributed across the functional categories?

3. Methodology

3.1. The Corpus

The corpus used in this study comprised the discussion sections of 423 research articles taken from six indexed journals in business management, following the Journal Citation Reports by Clarivate. The selection of journals was carried out according to the research categories of Journal Citation Reports released in 2020. Journals categorised into both business and management categories were selected. Their representativeness was confirmed by consulting two professors in business management from our institution. Research articles published from 2017 to 2021 were considered to ensure the most current data were used for analysis. As the study focuses on phrase frames in the discussion sections of research articles, only empirical research articles with a separate section entitled "Discussion" were selected. A total of 423 research articles were chosen, and their discussion sections were extracted for phrase frame analysis. Table 1 presents the number of research articles and the word count of the discussion sections taken from each journal.

Table 1. The make-up of the corpus.

Journal	Texts	Word count
BRQ-Business Research Quarterly	70	82,992
Asian Business & Management	73	82,128
Information Systems and E-Business Management	71	83,011
European Management Journal	69	82,911
Business Process Management Journal	68	83,102
International Entrepreneurship and Management Journal	72	82,905

3.2. Procedure

The procedure involved several stages. First, all four-word phrase frames were identified based on frequency and cut-off points. Then, the concept of keyness was applied to sort out the key phrase frames from the phrase frame inventory. Once all key phrase frames were identified, they were examined in terms of their structures and functions.

3.2.1. Identification of phrase frames

The phrase frames were extracted from the corpus using *KfNgram* program (Fletcher, 2022), a corpus-linguistic software capable of extracting lists of n-grams of varying lengths from a corpus. Phrase frames were derived from n-grams that were identical with only one variable slot. For instance, the n-grams *the rest of the* (25), *the impact of the* (20), and *the context of the* (30) would generate the phrase frame *the * of the* with

a frequency of 75. We examined four-word phrase frames, as most phrase frame research has focused on four-word constructions (e.g., Golparvar & Barabadi, 2020; Grabowski, 2015; Römer, 2010), and it would be more meaningful to compare findings of phrase frames with identical lengths. The list of phrase frames generated automatically was subjected to further manual checking. First, phrase frames with only one slot filler were excluded from further investigation, as these one-slot-filler phrase frames were another manifestation of lexical bundles. Second, phrase frames comprising proper names and mathematical symbols were also discarded from further analysis. Lastly, phrase frames with variants or slot fillers at the beginning or end of the sequences were removed, as these phrase frames with external variation are very likely to be lexical bundles (Garner, 2016).

3.2.2. Frequency and range criteria

After the manual filter was conducted, the remaining four-word phrase frames were checked to ensure they met the minimum frequency and range requirements. Following Biber et al. (2004), phrase frames, as a recurrent form of phraseological sequences, should meet a frequency threshold of 20 occurrences per million words, i.e., 60 in this corpus. As for range, the phrase frames had to appear in at least 10% of the journal article introductions (i.e., 32 introductions) to avoid writer idiosyncrasies. The range identification was conducted using *AntConc* program (version 3.5.9) (Anthony, 2021).

3.2.3. Identification of key phrase frames

Utilising the concept of keyness, key phrase frames specific to business management were identified by comparing normalised frequencies of each frame to those in the academic section of the Corpus of Contemporary American English (COCA) (Davies. 2022). Phrase frames with higher normalised frequencies in COCA were excluded from further analysis. The remaining phrase frames' normalised frequencies were used to calculate the symmetric Mean Absolute Percentage Error (sMAPE) which involves "the difference of the two values over the average of the two values" (Cunningham, 2017, p. 75), i.e., [(Business Management—COCA)/(Business Management + COCA)/2]. The maximum value of sMAPE is 2, provided that the frequency of the phrase frame in reference corpus is not zero.. The study set a threshold sMAPE score of 1.95 to include only phrase frames with 100 times more occurrences in the business management corpus than in COCA. To ensure statistical significance, Fisher's exact test was conducted ($p < 0.0001$). As a non-parametric test, Fisher's exact test is suitable for linguistic analysis, as it does not assume a specific distribution of the underlying data. The refined list of key phrase frames meeting the criteria were included for further structural and functional analysis.

3.2.4. Structural and functional analysis of key phrase frames

The structures of key phrase frames in the study were studied following Gray and Biber's (2013) structural categorisation of phrase frames:

1. Phrase frames with content words (except verb) (e.g., *are * likely to*).
2. Phrase frames with at least one verb (e.g., *is * associated with*).
3. Phrase frames formed by function words, including conjunction, determiner, preposition and pronoun (e.g., *in * to the*).

The final stage of analysis involved examining key phrase frames' discourse functions using Simpson-Vlach and Ellis's (2010) functional taxonomy, comprising referential, stance, and discourse organising expressions. Functional categories were determined based on the semantics of frame variants and their context, following Lu et al. (2018).

4. Results

4.1. The most frequent key phrase frames

The key phrase frames qualified for inclusion were required to occur at least 20 times per million words in the corpus and to have a sMAPE value of 1.95 and $p < 0.0001$ on Fisher's exact test. Overall, 63 four-word phrase frames satisfied these criteria. The variable slots in all key phrase frames were in the medial position. Table 2 presents the 20 most frequent four-word phrase frames, including information on the normalised frequencies of key phrase frames and the most frequent slot fillers. The complete list of key phrase frames and the frequent slot fillers can be found in Appendix A.

Table 2. The 20 most frequent 4-word phrase frames and the fillers.

Phrase frame	Frequency (per million words=pmw)	Most frequent fillers
the * of the	199	adoption, centrality, development, effects, value
to the * of	192	dynamic, emergence, influence, liabilities, performance, source, success

Phrase frame	Frequency (per million words=pmw)	Most frequent fillers
the * effects of	185	competitive, differential, independent, interaction, moderating, negative, positive
that the * of	162	adoption, effects, impact, influence, performance, presence, strength, value
the * of a	120	benefit, effect, establishment, existence, strength, success
in the * of	112	development, diffusion, implementation
the * of international	90	context, impact, field, effect, influence
at the * level	82	country, firm, global, individual, micro, national, partnership, subsidiary
in the * market	80	current, domestic, home, international, local
for the * of	77	development, effect, impact, inclusion, share, viability
the * of cultural	68	effect, incorporation, influence, measures, role
of the * in	66	countries, government, product, variance
of the * country	62	focal, home, host, target
about the * of	46	effect, effectiveness, role, risks
as a * for	45	basis, proxy, substitute, tool
of cultural * in	42	differences, distance, values
the performance * of	42	benefits, consequences, implications
other * in the	42	companies, firms, organizations
the perceived * of	40	realism, trustworthiness, vulnerability
likely to * in	40	engage, internationalise, invest

As shown in Table 1, *the * of the*, with 199 occurrences pmw, is the most frequent four-word phrase frame in the business management corpus. The most frequent slot filler of this phrase frame is *adoption* with a frequency of 17. This shows that the sequence *the adoption of the* is the most frequent realisation of this key phrase frame. Other realisations of this key phrase frame include *the centrality of the*, *the development of the*, and *the effects of the*. Another four-word frame, occurring 192 times pmw, is *to the * of*, which is typically filled by words such as *dynamic (to the dynamic of)*, *emergence (to the emergence of)*, *influence (to the influence of)*, *liabilities (to the liabilities of)*, and *performance (to the performance of)*. As shown in Table 2, these four-word phrase frames reflect various issues in the field of business management, such as market (*in a competitive/ foreign market —in the current/domestic/home/international/local market —relative market share/size of —in the/their home market —and customer/export/relative market share — export market focus/share and*), capital (*of intellectual/social capital to —of informal/potential social capital*), level (*at the country/firm/global/individual/micro/national/partnership level*), employees (*employees in collectivistic/individualistic countries*), economy (*in a/the transition economy — in a market/transition economy*), and country (*in a foreign/host country — of the focal/home/host/target country*).

4.2. Structural analysis

Using the structural classification of phrase frames proposed by Gray and Biber (2013), the key phrase frames were categorised according to structural correlates. We grouped them into three groups based on the types of words appearing in the frames. Table 3 presents the types (different phrase frames) and tokens (total number of phrase frames) of four-word key phrase frames by structure.

Table 3. The distribution of four-word key phrase frame types and tokens across the structural categories

Structure	Type	%	Token	%
Non-verb content word frame	48	76	1776	60
Verb-based frame	4	6	119	4
Function word frame	11	18	1065	36

The majority of key phrase frames are non-verb content word frames (76%), followed by function word frames (18%), and verb-based forms (6%). Frame token proportion follows a similar trend, but function word frame tokens have a higher percentage (36% vs. 18%), indicating their prevalence in business management

research article discussions. The low percentage of function word frame types is due to limited function word frames in English, as they belong to closed classes with limited membership.

a)   Non-verb content word frames:

   a single [corporate/global] culture
   global competency [acquisition/learning] and
   in the [integration/internationalization/selection] process

b)   Verb-based frames:

   affect the [performance/share] of
   have the [capacity/potential] to
   the [costs/risks] associated with

c)   Function word frames:

   as a [basis/proxy/substitute/tool] for
   in the [development/diffusion/implementation] of
   that the [adoption/effects/impact/influence/performance] of

4.3. Functional analysis

The present study adopted Simpson-Vlach's (2010) functional taxonomy to describe the discourse functions that key phrase frames serve in the discussion sections of business management research articles. The distribution of the key phrase frames across three functional categories by phrase frame types and tokens is reported in Table 4. As shown in Table 4, referential key phrase frames make up the largest category. The key phrase frames such as *at the country/firm/global/individual/micro/national/partnership/subsidiary level* and *in the current/domestic/home/international/local market* are two examples for this type of key phrase frames. Stance expressions, like *foreign firms may/should not and have the capacity/potential to*, are the second most frequent key phrase frames in business management research article discussion section. Finally, there are no instances of discourse organising expressions among the key phrase frames.

Table 4. The distribution of 4-word key phrase frame types and tokens across the functional categories

Structure	Type	%	Token	%
Referential	59	94	2845	96
Stance	4	6	115	4
Discourse	0	0	0	0

The following section presents examples for both referential and stance expressions. Referential expressions are common and serve a myriad of functions. Business management writers use them for clarification, identification, and contextualisation. For instance, the key phrase frame such as *of the * environment* is a referential expression, and the slot fillers of this frame (e.g. *institutional, local, regulatory*) allow writers to further clarify their explanation of the concept of environment. Examples 1 and 2 specify the different attributes of environment.

1.   .... the impacts *of the institutional environment* surrounding the Korean high-tech industry and the advancement of information technology may have been ....
2.   .... and that an increased understanding *of the local environment* provides some latitude in strategy selection ....

Apart from serving as framing attribution expressions, referential phrase frames also function as identification/focus expressions when authors need to point out that which they consider to be important. In other words, such expressions are often used as a marker of crucial issues or problems. For example, the key phrase frame *about the * of* is a referential expression serving the identifying/focusing function, and the different fillers (e.g. effect, effectiveness, role, risks) serve as the focused element in the expressions. Examples 3 and 4 are examples of identification/focus expressions.

3.   Despite doubts *about the effectiveness of* such laws, the empirical analyses showed that investors from countries that implemented the OECD Anti-Bribery ....
4.   In organizations emphasizing competition among employees, higher-ups should be more cautious *about the risks of* exposing individual disadvantages through expressive friendship.

Another function of referential phrase frames observed in the study is contextualising the results or interpretations of the results. This is very common in discussion section as it is where authors need to contextualise to show if the results or interpretations are appropriate. An example is *in socially * regions*, filled by words such as *poor*, and *rich*. Examples 5 and 6 show how referential expressions contextualise the results or interpretations in discussion section.

5. .... the potential for connecting to other firms could lead to bad decisions, especially for firms located *in socially poor regions*.
6. .... but that firms that invest substantially in R&D and are located *in socially rich regions* are less prone to being involved in international markets for technology.

The second functional category investigated in this study is stance expressions. Stance expressions are useful in conveying epistemic meaning and writer's attitude towards a particular proposition, and indicating ability and possibility. The key phrase frame *foreign firms * not*, having *should* and *may* as its only two fillers, is a stance expression that conveys writer's attitude towards making business decisions, and signals the possibilities and suggestions in business collaboration. Examples 7 and 8 illustrate this attitudinal stance.

7. *Foreign firms should not* overstate the performance benefits of experience and should make efforts to find means of preventing reliance on ....
8. Without an awareness of the possible drawbacks of learning from experience, *foreign firms may not* be able to effectively collaborate with their partners in IJVs.

Apart from serving as attitudinal stance, key phrase frame such as *have the * to* with *capacity* and *potential* as the slot fillers suggest explanations for problems raised in the discussion section, and indicate the abilities in making business arrangements and decisions.

9. Our findings show that informal arrangements developed at the relationship level *have the capacity to* overcome the difficulties engendered by dissimilarities in the informal institutional environment.
10. Prior research recognizes that subsidiary managers *have the potential to* take initiative, but these managers are usually seen as acting for the "greater good" of the MNE ....

5. Discussion, pedagogical implications and conclusion

5.1. Discussion

Past research in phraseology highlights the importance of phraseological expressions in academic writing for discourse community membership (e.g., Biber et al., 1999; Biber et al., 2004; Hyland, 2008b, 2012; Salazar, 2014). This study contributes to phraseology research in academic discourse by examining non-contiguous phraseological expressions, structures, and discourse functions of key phrase frames in business management research article discussions. Using the concept of keyness, we identified 63 four-word key phrase frames in the discussion sections, which were refined through multiple inspection stages to ensure part-genre specificity. These key phrase frames underwent structural and functional analysis, utilising Gray and Biber's (2013) structural taxonomy and Simpson-Vlach and Ellis's (2010) functional taxonomy.

Th findings of this study reveal similarities and differences with previous research. It aligns with Lu et al. (2018) and Golparvar and Barabadi (2020) in that the majority of key phrase frames (type: 76%; token: 60%) were non-verb content word frames. However, it differs from Gray and Biber (2013) and Cunningham (2017), who found function word and verb-based phrase frames predominant in their corpora. This disparity may stem from the different corpora used, methodological differences (e.g., Gray and Biber's direct approach), disciplinary variations, and genre variations. The present study also observes disciplinary differences when compared to Golparvar and Barabadi (2020), which examined higher education research article discussions. Among the top 20 four-word key phrase frames, only three (*to the * of, about the * of, at the * level*) were found in both studies' discussion sections. These discrepancies highlight the influence of factors such as genre, discipline, and methodology on phrase frame findings.

Functional analysis of key phrase frames revealed referential expressions as predominant, aligning with Lu et al. (2018) and Golparvar and Barabadi (2020). Referential expressions, identifying entity attributes, are indeed important in academic writing, especially in introductions and discussions. Using Simpson-Vlach and Ellis's (2010) taxonomy, functions were subcategorised, with referential expressions divided into clarification, identification, and contextualisation. This functional analysis may benefit EAP researchers studying phrase frame use and functions in business management research articles, considering their unique priming patterns, as highlighted by Hoey (2005).

The overall phraseology patterns discovered in this study reflect key phrase frames' characteristics in business management research article discussions, marked by structural and functional correlates similar to lexical bundles. More non-verb content word frames were found compared to verb-based and function word frames. While Gray and Biber (2013) linked phraseological variation in academic writing to grammatical constructions, this study found that key phrase frames in business management discussions were characterised by both grammatical and lexical patterning. This contrasts with Gray and Biber's (2013) observations. Some phrase frames in academic writing are lexical constructions, while others are formed by functional or

grammatical words. Non-contiguous phraseology in business management discussions exhibits both lexical and grammatical features with equal theoretical and pedagogical significance, as supported by this study and related literature (e.g., Lu et al., 2018; Golparvar and Barabadi, 2020).

Phrase frames, comprising fixed frames and variable slots, reveal how academic authors cohesively and creatively present ideas, negotiate meanings, and interpret research outcomes, especially in discussion sections. Analysing non-contiguous phraseological expressions identifies phrase frames and variable fillers (e.g., *dynamic, emergence, influence, liabilities, performance, source* for the phrase frame *to the * of*), highlighting distinctive academic writing patterns. The variable fillers can serve as keywords to understand linguistic negotiation in business management academic discourse. Consequently, phrase frames hold significant pedagogical potential to expand EAP learners' repertoire and raise awareness of creativity and discourse conventions in academic writing.

5.2. Pedagogical implications

From a pedagogical perspective, key phrase frames can support EAP writing by providing learners a clearer understanding of language usage within specific disciplines, genres, or part-genres (Cunningham, 2017). As shown in Appendix A, most key phrase frames combine lexical and grammatical words, with some common lexical words having specific uses in a business management context (e.g., *mode and * performance*, *employees in * countries*, *in a * market*, *of the * environment*). While some of the lexical words in the frames seem common in everyday language (e.g., *mode, performance, countries, market, environment*), they are of specific use in business management context. As Durrant (2009) noted, words like "mean" and "address" are used differently in academic and general English contexts. EAP learners need to learn phrase frame constructions relevant to their subject for discourse community membership. Additionally, the list of key phrase frames can help EAP learners produce language more phraseologically similar to native speakers (Hunston and Francis, 2000, p.10).

Previous research (e.g., Barfield, 2009; Boer et al., 2014) confirmed that simple exposure to multi-word expressions is insufficient for acquisition; learners should be made aware of their importance (Nizonkiza & Van de Poel, 2019; Ying & O'Neill, 2009), especially those specific to their discipline (e.g., Cortes 2004; Hyland 2008b). Nattinger and DeCarrico (2008) proposed exposing learners explicitly to structural forms of language, as they interlock with strategies for cohesive and creative writing. Other scholars also advocated for consciousness-raising and explicit teaching of phraseology (e.g., Hill, 2000; Howarth, 1998; Lei & Liu, 2018; Nesselhauf, 2005; Salazar, 2014).

Language instructors can introduce key phrase frames and their variants to EAP learners in business management studies, showing how they are used in academic papers, particularly in discussion sections. With the growing popularity of corpus-based language pedagogy, EAP learners should develop corpus literacy (Ma et al., 2021). Corpus data can be introduced as a learning tool through authentic concordance exercises containing selected key phrase frames. To achieve "multiple focused encounters in context and in the classroom" (Byrd & Coxhead, 2010, p. 56), learners should be exposed to ample authentic texts, as provided by corpus data and tools. EAP instructors can also use key phrase frames lists as testing materials to assess learners' phraseological knowledge and competence.

However, the focus on the discussion section of research articles may be both a strength and limitation. On the one hand, it limits the pedagogical value of key phrase frame compilation to this specific part-genre. On the other hand, the study is novel in developing the awareness of phraseological variation across part-genre. The research attention on part-genre is critical to improve EAP learners' part-genre awareness and competence. Another limitation is on the length of key phrase frames investigated in this study. The current study only examined four-word key phrase frames. Our future effort in extending the list will examine five-word key phrase frames in order to include more key phrase frames that are pedagogically relevant.

5.3. Conclusion

The current study focused on the key phrase frames in the discussion section in business management research articles. Further studies may investigate phrase frames in other sections of research articles in the same or different field of study. Future research can also examine phrase frames of the rhetorical moves of the part-genre in business management or other field of study, which requires a much larger corpus than the one developed for this study. Furthermore, EAP experts' and teachers' evaluation of the pedagogical values of the key phrase frames identified in this study may merit further examination. Finally, we also call for more empirical research investigating the effectiveness of teaching the key phrase frames in EAP classroom to inform future efforts in compiling new academic expressions.

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Appendix A

List of key four-word phrase frames in the discussion section of business management research articles

Phrase frame	Frequent fillers
a * share of	greater, lower
a single * culture	corporate, global
about the * of	effect, effectiveness, role, risks
affect the * of	performance, share
an * on the	effect, impact
and * dynamic categories	domestic, global
and * growth rate	export, relative
and * in the	quality, trust
and * market share	customer, export, relative
as a * for	basis, proxy, substitute, tool
at the * level	country, firm, global, individual, micro, national, partnership, subsidiary
between * and local	foreign, global
different * of trust	bases, patterns
does not * participative	endorse, support
economic * of the	development, recession
emerging * such as	economies, markets
employees in * countries	collectivistic, individualistic
entry mode * and	choice, selection, research
export market * and	focus, share
for the * of	development, effect, impact, inclusion, share, viability
foreign firms * not	may, should
general * to trust	disposition, propensity
global competency * and	acquisition, learning
have the * to	capacity, potential
in * countries we	developing, industrialized
in * home market	the, their
in * transition economy	a, the
in a * country	foreign, host
in a * economy	market, transition
in a * market	competitive, foreign

Phrase frame	Frequent fillers
in socially * regions	poor, rich
in the * market	current, domestic, home, international, local
in the * of	development, diffusion, implementation
in the * phase	integration, intermediary
in the * process	integration, internationalisation, selection
level of * development	economic, institutional
likely to * in	engage, internationalise, invest
mode * and performance	choice, selection
of * capital to	intellectual, social
of * friendship at	expressive, instrumental
of * social capital	informal, potential
of cultural * in	differences, distance, values
of the * country	focal, home, host, target
of the * environment	institutional, local, regulatory
of the * in	countries, government, product, variance
other * in the	companies, firms, organizations
positive * on the	effect, impact
propensity to * in	engage, trust
relationship with * patenting	domestic, foreign
relative market * of	share, market
that the * of	adoption, effects, impact, influence, performance
the * associated with	costs, risks
the * competitiveness of	export, national
the * context of	institutional, local
the * effects of	competitive, differential, independent, interaction, moderating, negative, positive
the * of a	benefit, effect, establishment, existence, strength, success
the * of cultural	effect, incorporation, influence, measures, role
the * of institutions	evolution, impact
the * of international	context, impact, field, effect, influence
the * of the	adoption, centrality, development, effects, value
the perceived * of	realism, trustworthiness, vulnerability
the performance * of	benefits, consequences, implications
to the * of	dynamic, emergence, influence, liabilities, performance, source