

# Exploring Lexico-grammatical Patterns in Doctoral Dissertations: A Multidimensional Analysis

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## Abstract

Doctoral dissertations occupy a prominent place in academic communication and advancement. This genre applies its intricate lexical and grammatical patterns to shape its effectiveness and these patterns need to be studied. The study aims to investigate the discussion section of the doctoral dissertations from ten leading British universities. The objective of the study is to explore the lexico-grammatical similarities and differences between ELT and Linguistics dissertations. It also attempts to analyze how far the lexico-grammatical choices used in the discussion section of ELT dissertations are similar to or different from those of Linguistics. The corpus used in this study consists of 200 discussion sections: 100 from ELT and 100 from Linguistics. A random sampling technique was used to collect data which consisted of publicly available dissertations. Biber's Tagger was used to annotate grammatical and lexical features. To find out the significant interaction between the selected disciplines, a factorial ANOVA was used. The study is significant in terms of providing insight into the preferred lexico-grammatical patterns used by the students. It further explains how two different disciplines – Linguistics and ELT, make various lexico-grammatical choices. The findings of the study will help the researcher from around the world, particularly the ones from non-English speaking countries, in terms of familiarizing them with the conventions involved in writing a dissertation.

**Keywords:** ELT, Linguistics, multidimensional analysis, register analysis, British English

## 1. Introduction

After many years of research and study, PhD candidates would be able to produce doctoral dissertations. Which is a great contribution to the knowledge of academia. These comprehensive documents not only provide significant insight into how the linguistic patterns are used in forming those documents but also present the level of knowledge and intellectual level of PhD candidates.

It is a proven fact that if the researchers are aware of the structure of the genres in which they are working then they can have a better understanding of academic and professional discourse. The doctoral thesis is a genre with high stakes (Carter, 2011). The complex connections between vocabulary (lexicon) and grammar in these dissertations may provide important insights into the rhetorical devices and communication techniques used by PhD research.

There are a lot of studies conducted on writing research articles. A lot of work has also been done on the analysis and the pedagogical implications of PhD thesis, but it is very rare to find corpus-based studies done specially for the improvement in the writing of PhD students. All the sections in the dissertation are important. However, Swales (1990) believes that the discussion section of a thesis presents a mirror image of the entire document. Chatterjee (2008) supports the statement and adds that the discussion section of a dissertation is the most challenging. To support PhD students, there was a dire need to focus on the language structure of this section, specifically in non-native contexts. Thus, the present study fills in the gap and provides a corpus-based analysis of the discussion sections of PhD linguistics and ELT dissertations from the top ten universities of the UK.

The authors prefer particular lexical and grammatical patterns to suit the purpose of their writing or accommodate their piece of writing in a specific genre or register. The study presents a comprehensive analysis of the lexico-grammatical patterns used in the discussion sections of the dissertation by using the multidimensional model. The model presents a comprehensive picture of the lexico-grammatical preferences used in a particular genre as it helps to investigate more than 150 lexical and grammatical features. This study will explore the variations of five textual dimensions, namely, involved versus informational production, narrative versus non-narrative, explicit versus situation-dependent, overt expression of argumentation and impersonal versus non-impersonal. Each dimension offers and continuum of positive and negative linguistic features. They are in complementary distribution to each other which means that if there is an increase in the positive linguistic features, there will be a decrease in the negative linguistic features and vice versa. It investigates the linguistic structure and the features that are prevalent in the writing style of PhD candidates. The study is significant in terms of providing a comprehensive analysis of the special linguistic choices used in the dissertation. Moreover, the study will present the pedagogical implications by examining the variation in the use of linguistic features of both disciplines.

There are several reasons to investigate the lexico-grammatical patterns of PhD dissertations. One of the reasons is that, by investigating linguistic preferences and strategies, it is possible to explore the specific structure of a particular genre which contributes to the coherence and argumentation of academic writing. We can also examine the specific lexicon, phrases and grammatical constructions employed by PhD researchers, in addition to gaining insight into the rhetorical and argumentative strategies.

As this study is a comparative analysis of two disciplines, it also acknowledges the possible influence of the disciplinary differences on the lexico-grammatical preferences used in the discussion section of PhD dissertations. Every academic discipline has distinct linguistic norms, and they have their standards of use. So, this may impact the linguistic preferences and the structure chosen by the PhD scholars. The goal of the study is to reveal discipline-specific trends and shed light on how disciplinary norms impact the lexico-grammatical landscape of doctorate dissertations. To achieve this goal, a multidimensional approach will be used. The approach provides a thorough examination of the interaction between lexicon and grammar, making it possible to highlight common linguistic patterns in the two disciplines of doctoral dissertations. The research attempts to present a picture of the variety of language used in the two disciplines, i.e., Linguistics and ELT. In conclusion, the study provides a comprehensive analysis of the lexico-grammatical features of academic writing using a multidimensional approach (1991). It examines more than 150 linguistic features from the two disciplines. To sum up, the study intends to increase our understanding of academic discourse and provides a comprehensive analysis of lexico-grammatical choices employed by native PhD scholars to support the development of skilled academic writers in non-native contexts.

## 2. Literature Review

Research studies focus on a wide range of registers and genres. The academic genres including textbooks, book reviews, reports, presentations, research articles, and dissertations have been studied from various perspectives. Among various channels, dissertations are considered a comprehensive and effective way for exploring and disseminating knowledge and new information to the audience, therefore they attract the attention of the researchers. The researchers have drawn on different approaches to investigate various aspects of the dissertation. They have studied the dissertation from a variety of disciplines including applied linguistics and ELT (Peacock, 2002; Amirian et al., 2008; Khansir, 2013; Le, 2015; Hashemi & Gohari, 2016; Suherdi et al., 2020; Richter et al., 2022), education (Candarli & Jones, 2019; Vecaldo et al., 2019), biology (Martínez, 2003), dentistry (Basturkmen, 2012), & social sciences (Amnuai, 2017; Zagrean et al., 2022).

As compared with research articles, little research has been done on dissertations. However, the majority of scholars have focused on the overall structure of dissertations. Like, Thompson (2005) examined the master's and doctoral dissertations of ESP and found how useful was the content for the students and teachers. The study provided genre descriptions covering the introduction sections, reviews of the literature, discussion sections and conclusions of dissertations.

Further, Afzaal et al. (2020) examined the variations in undergraduate students' academic writing from two Pakistani universities, one situated in an urban area and the other in a rural one. Data were obtained from undergraduate students' dissertations and abstract and discussion sections were selected for analysis. The study employed Swales' CARS model to examine academic writing proficiency and discovered that certain moves were more common in the dissertations of students from rural areas. Hedges, however, played a significant role in the dissertations of students from the university in the urban area.

Surprisingly little research has been done on the dissertation's discussion part. Using Martin and White's (2005) appraisal framework, Fendri and Triki (2022) examine the style of Tunisian MA and PhD EFL researchers. Both qualitative and quantitative research is conducted on a corpus of 20 literature reviews and 20 discussion sections from 10 MA and 10 PhD English dissertations by Tunisian writers. Then, using SPSS, a quantitative analysis was conducted. According to the findings, MA researchers in both sections appear to have greater difficulty negotiating voice than PhD authors. Dialogic contraction in the MA subcorpus suggests that the author's viewpoint in the Literature Review section is limited and that the Discussion section fails to emphasize the author's contribution.

Some researchers examine the discussion sections written by native speakers. Like, Loghmani et al., (2019) analyze how native English speakers, enrolled in Ph.D. in TEFL, position their texts intertextually in discussion sections. Five discussion sections were selected and analyzed. The analysis was based on the Engagement subsystem of the appraisal model. The findings of the study showed that the writers could interact with possible interlocutors without difficulty. Additionally, they chose to use approximately twice as many dialogically contractive Engagement resources as dialogically expansive ones to reduce the likelihood of being rejected or disputed. Additionally, it was discovered that these authors gave enough room for the examination of alternative viewpoints despite developing their Discussion sections in a dialogically contractive manner.

The study of Karsali et al. (2018) aims to compare 120 discussion sections taken from American and Turkish PhD dissertations in the field of Educational Technologies. This comparison considered the basic features that should be present in an effective discussion section. The findings showed that most of the PhD dissertations of the American students incorporated the addition to the literature and limitations of investigations, while despite the fact that there were some very strong characteristics only a few Turkish PhD dissertations included them. Although most of the dissertations explained the findings and their significance, there was no emphasis on the significant findings in PhD dissertations of the Turkish students. In American and Turkish PhD dissertations, the pages of the discussion section were nearly equal.

The multidimensional approach was used for many studies, especially on newspaper genre (Ali & Ali, 2023; Ali and Paul, 2022). However, multivariate analysis of the discussion sections of dissertations has not attracted the attention of researchers and as a result, very little appears to be known in Multidimensional analysis of Linguistics and ELT. Jin (2018) explored linguistic co-occurrence patterns in

discussion sections of research articles (RAs) in the discipline of engineering. The study highlighted the linguistic variations that distinguish discussion sections of high-impact articles from those of low-impact articles. The most prominent differences were found on Dimensions 1, 3, and 5. Jin (2021) also analyzed the discussion sections of research articles from the discipline of chemical engineering. The MD results showed six salient linguistic patterns in the research articles.

Till now no research study has explored lexico-grammatical preferences in the discussion sections of interdisciplinary research articles and compares them. The present study fills this gap and explores lexico-grammatical similarities and differences between the discussion section of Linguistics and ELT dissertations.

**3. Methodology**

The study uses the multidimensional model introduced by Biber (1991) for the analysis of linguistic variation. The model is based on multiple dimensions/ factors. The model not only identifies and measures various linguistic features in different contexts but also identifies the relationship by comparing different genres/ registers.

To conduct a corpus-based study, the first step is the compilation of the corpus. The selection of the text is the most crucial, it should be collected in such a way that it represents the language that is being studied. Moreover, it should be large enough to provide sufficient data for analysis. Keeping into consideration these points the data for this study was selected and the corpus was compiled. It has been taken from the thesis from two disciplines, ELT and Linguistics from the top ten universities of UK, i.e., *The University of Cambridge, The University of Oxford, Lancaster University, The University of Manchester, The University of Edinburgh, The University of Aberdeen, University The College London, University of York, University of Warwick, and Newcastle University* (<https://www.thecompleteuniversityguide.co.uk/league-tables/rankings/linguistics>). 10 theses from both the disciplines from each university have been taken. Table 1 presents the details of the corpus.

Table 1. Details of the Corpus

Total No. of words in the Discussion Corpus	1,200,000
Total number of texts	100x2= 200
Total number of dissertations	200
Average No. of words per text	6000 words

Once the data was collected, it was cleaned. The next step was manual coding. Biber’s MD model (1991) was taken. It consists of five textual dimensions and each dimension includes multiple linguistic features that can be measured and analyzed. Then all the data was tagged, and the next step was descriptive statistics. The final step was to interpret the results. This involves drawing conclusions on the basis of the results of the comparison that indicates the relationship and patterns found in the data. The methodology for applying Biber’s multidimensional model involves selecting a corpus, collecting, and analyzing data, and interpreting the results. Overall, Biber’s five textual dimensions provide a framework for analyzing language use across various contexts and genres. The most important advantage of this model is that linguists and academics can learn more about the fundamental structures and patterns of language use in various situations by looking at the many dimensions and the characteristics that are associated with specific linguistic features.

**4. Analysis and Discussion**

*4.1 Dimension 1*

Biber named his first dimension as ‘Involved vs. Informational discourse’. If there are more negative features on this dimension, then it represents the informational discourse. But on the other hand, if there are more negative linguistic features then the discourse will be involved. Texts with a high informational level mean that they provide a lot of information and frequently use specialized or technical language. The density of nouns, adjectives and complex clauses are some of the characteristics of the text that belong to the negative polarity of this dimension. Table 2 presents the descriptive statistics of British ELT and Linguistics Discussion sections on Biber’s (1991). The results indicate that on this dimension both the disciplines show informational discourse as they fall on negative polarity. ELT discussion section with a mean score of -13.92 shows more informational discourse. While the Linguistics discussion section with a mean score of -13.78 is slightly less informational than the ELT discussion section.

Table 1. Variation across British ELT and Linguistics dissertations with reference to the discussion sections on Dimension 1

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
ELT	100	-13.9268	4.27207	-14.7745	-13.0791
Linguistics	100	-13.7822	4.20854	-14.6173	-12.9471

Figure 1 compares the results of the Discussion section of ELT and Linguistics dissertations on D1. The line in the figure indicates that the ELT discussion section shows more informational discourse than the Linguistics discussion section.

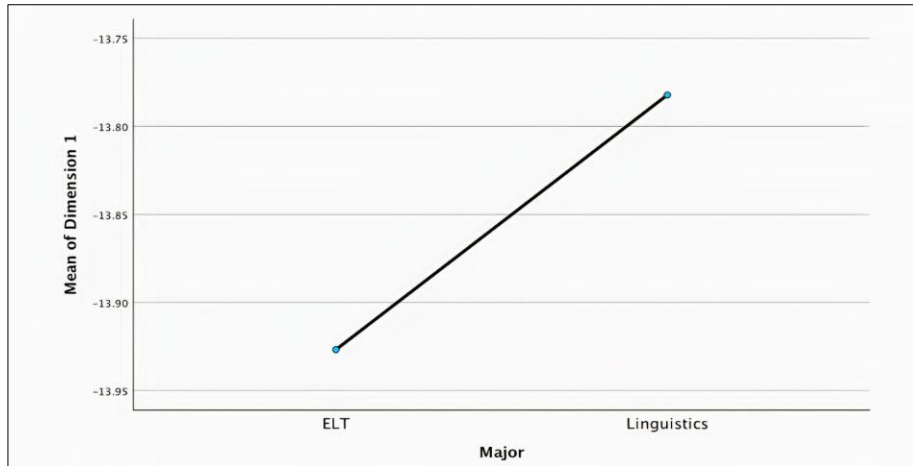


Figure 1. Linguistic variation among British ELT and Linguistics Dissertations with reference to the discussion part on dimension 1

4.2 Dimension 2

Dimension 2 is referred to as ‘Narrative vs. Non-narrative concerns’. The text in which the writer/ speaker plays an active role in the production of the content is referred to this dimension. Past tense verbs are the main markers for producing narrative discourse. Moreover, third person pronoun and verb-perfect aspect also depict that a discourse is narrative in nature. In contrast to dimension 1, on dimension 2 Linguistics discussion section shows a higher mean score than the ELT sections.

Table 2. Variation across British ELT and Linguistics dissertations with reference to the discussion sections on Dimension 2

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
ELT	100	-2.7303	1.29805	-2.9879	-2.4727
Linguistics	100	-2.9363	1.49367	-3.2327	-2.6399

Both the disciplines fall on negative polarity showing non-narrative discourse. The Linguistics discussion section with a mean score of -2.93 shows more non-narrative concerns than the ELT discussion section (-2.73). Figure 2 represents the difference in producing non-narrative discourse of both disciplines. The Linguistics discussion section is far more non-narrative than the ELT discussion section.

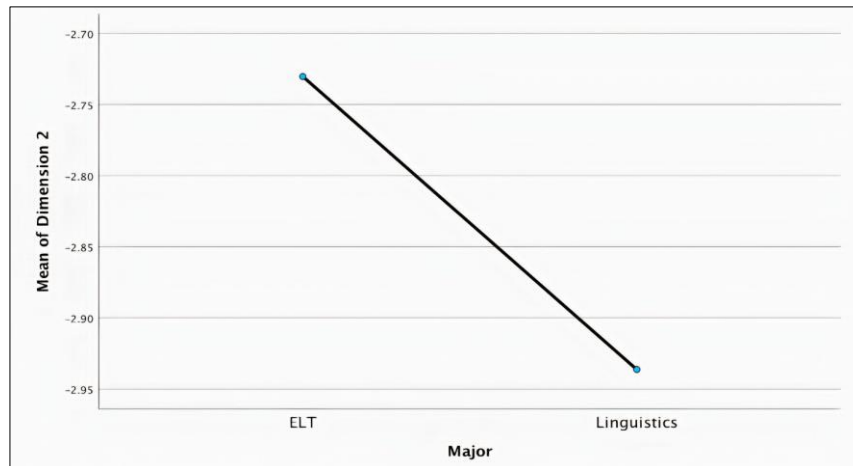


Figure 2. Linguistic variation among British ELT and Linguistics Dissertations with reference to the discussion part on dimension 2

4.3 Dimension 3

Dimension 3 is labelled as ‘explicit vs. situation-dependent discourse’ by Biber. The presence of wh clause, phrasal connectors and nominalization indicates that a discourse is explicit. While texts with high situationality mean scores offer more specific details about the target audience, setting, and purpose of the discussion. Deictic language, such as place-, speaker-, and listener-related pronouns and adverbs also mark the presence of situation-dependent discourse. On this dimension, the discourse indicates how closely a text has a connection with another text or an information source. In the texts that are related to this dimension, more wh clauses, phrasal connectors and nominalization can be found. On this dimension, both disciplines show explicit discourse.

Table 3. Variation across British ELT and Linguistics dissertations with reference to the discussion sections on dimension 3

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
ELT	100	7.4043	2.29895	6.9481	7.8605
Linguistics	100	6.7024	2.93687	6.1197	7.2851

On this dimension Linguistics discussion section with a mean score of 6.70 is less explicit than the ELT discussion section (7.40). Figure 3 clearly shows the difference between ELT and Linguistics discussion sections in producing explicit discourse. There is a significant difference, as shown in the figure, the ELT discussion section is more explicit than the Linguistics dissertation section.

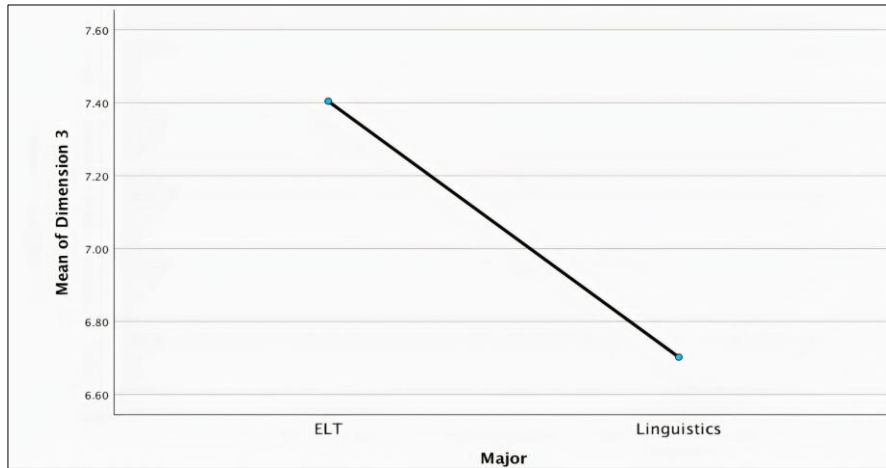


Figure 3. Linguistic variation among British ELT and Linguistics Dissertations with reference to the discussion part on dimension 3

4.4 Dimension 4

Biber named this dimension as an ‘Overt expression of argumentation/ persuasion’. *Persuasive verbs, Infinitives, and subordinating conjunctions* are some of the main linguistic features that mark the presence of argumentative discourse. There was no negative dimension in the data he used for his study. However, the results of the ELT and Linguistics discussion section show negative discourse. *Private verbs, public verbs, and hedges* are some of the main linguistic features that mark the presence of non-argumentative discourse.

Table 4. Variation across British ELT and Linguistics dissertations with reference to discussion sections on Dimension 4

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
ELT	100	-2.4545	1.97009	-2.8454	-2.0636
Linguistics	100	-2.5087	2.16774	-2.9388	-2.0786

Like dimensions 3 and 4, on this dimension also, the Linguistics discussion section indicates the higher scores. ELT with a mean score of -2.45 is less non-argumentative than Linguistics (-2.50). Figure 4 compares the results of the Discussion section of ELT and Linguistics dissertations on D4. The line in the figure indicates that the ELT discussion section shows less non-argumentative discourse than the Linguistics discussion section.

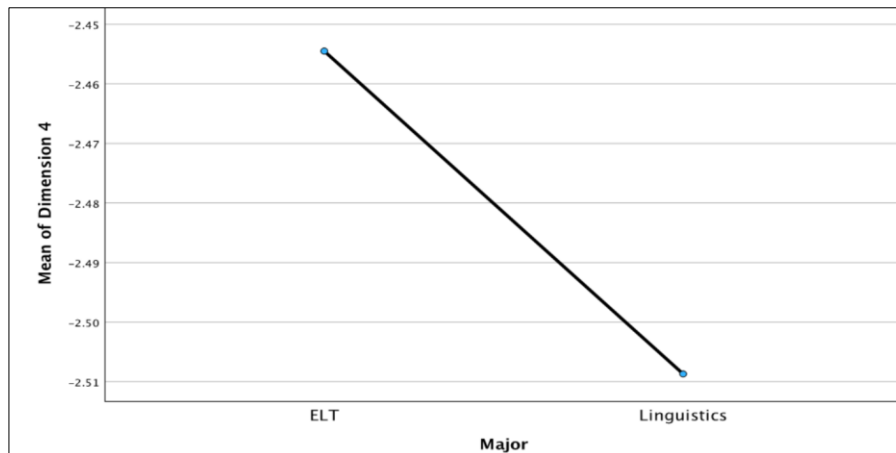


Figure 4. Linguistic variation among British ELT and Linguistics Dissertations with reference to the discussion part on dimension 4

4.5 Dimension 5

The term "Abstract vs. Non-Abstract style" refers to this dimension. This dimension indicates the level of abstraction or generalisation in a text. High-abstraction texts express specific characteristics more through the use of *passive verbs*, *agentless passives*, *adverbial conjuncts* and *subordinating- conjunctions*.

In contrast to other dimensions, the mean scores of dimension 5 fall on positive polarity.

Table 5. Variation across British ELT and Linguistics dissertations with reference to the discussion sections on Dimension 5

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
ELT	100	4.5350	2.25382	4.0878	4.9822
Linguistics	100	4.6048	2.68305	4.0724	5.1372

The Linguistics discussion section with a mean score of 4.60 is more abstract than the ELT discussion section (4.53). Figure 5 shows the marked difference in the mean scores of ELT and Linguistics discussion sections. Like all the other dimensions they are different in producing discourse. On this dimension, the Linguistics discussion section is more abstract than the ELT discussion section.

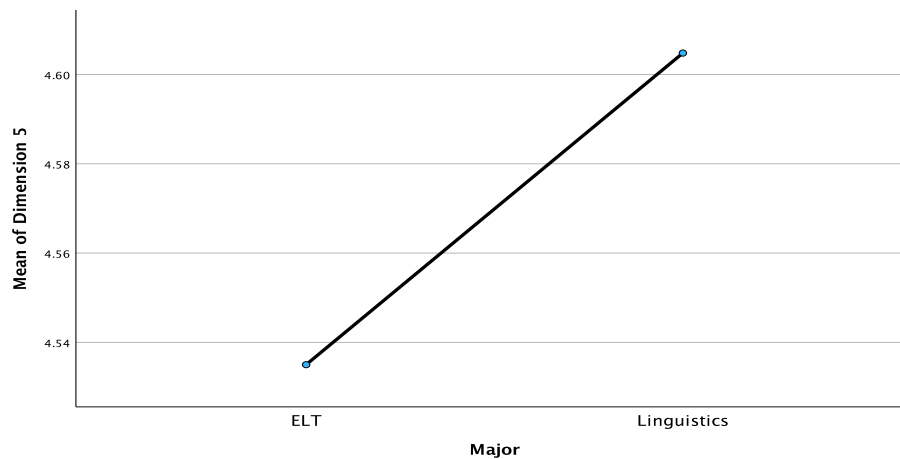


Figure 5. Linguistic variation among British ELT and Linguistics Dissertations with reference to the discussion part on dimension 5

The statistical analysis provides valuable insight into the particular qualities of academic writing from two different genres. The study explored how doctoral researchers employ different lexico-grammatical features to persuasively communicate their point of view. Through uncovering these features, the study guides prospective scholars to improve the quality and impact of their academic writing.

5. Conclusion

This study used a multi-dimensional approach to explore the lexico-grammatical pattern in doctoral dissertations. It examined the discussion section of the selected theses from the leading British universities. The lexicon and grammar were closely examined to identify the underlying patterns of variance between ELT and linguistics dissertations. This study explains how the lexico-grammatical choices vary in two closely connected disciplines. It further emphasizes that as linguistic norms and conventions vary across academic disciplines, genres, and registers, the landscape of dissertations is no exception. This rigorous analysis explored how different disciplinary settings of the same genre impact linguistic choices.

From the results, it is evident that on dimension 1, the ELT dissertations' discussion section produces more informational discourse in comparison with Linguistics. While on dimension 2, Linguistics discussion sections produce more non-narrative discourse than ELT discussion sections. Likewise, on dimension 3, Linguistics discussion sections are less explicit than ELT discussion sections. On dimension 4, the Linguistics discussion sections again show a higher score than the ELT discussion sections. Linguistics discussion sections are more non-argumentative than ELT discussion sections. So far as dimension 5 is concerned, the Linguistics discussion sections are more abstract than the ELT discussion sections. So, the Linguistics discussion section is more non-narrative, non-argumentative, and abstract and less informational and explicit than the ELT discussion section.

The findings of the study have significant pedagogical implications. An insight into the lexico-grammatical patterns used by the researchers in the leading English universities can help in developing specific methods of teaching to improve the researchers' academic writing skills. The data can further be used to develop material for teaching academic writing to PhD students. It is also important to recognize that exploring the lexico-grammatical pattern from doctoral dissertations is only the beginning of a process. These linguistic preferences can further be probed to advance academic communication and doctoral research quality. Dissertations from other disciplines can also be studied. A comprehensive comparison of the preferred linguistic choices by the authors of different disciplines can further provide insight into the subject.

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**Authors contributions**

Dr. Ebtesam Abdulhaleem was responsible for the study design and revising. Dr. Sadia Ali was responsible for data collection and drafting the manuscript. Both authors read and approved the final manuscript.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.

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