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Analyzing Lexical Density and Readability in IELTS Band 4 Students' Writing Test

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ABSTRACT

This study explores the lexical density and readability levels of writing produced by IELTS Band 4 students. The main objectives are to assess the lexical density and readability of their writing across ten writing tests. The study employs a descriptive qualitative research method, using data collected from 10 writing tests conducted by IELTS Band 4 students. Lexical density is determined using the "Analyze My Writing" website, while readability is assessed using the Flesch Reading Ease formula and scale. The findings reveal a wide range of lexical density, ranging from 46.98% to 63.93%, indicating varying levels of content richness and complexity in the students' writing. Similarly, readability scores vary significantly, with scores ranging from 34.21 to 66.32, reflecting differences in text difficulty and ease of comprehension. These findings underscore the diverse linguistic proficiency and accessibility of writing among IELTS Band 4 students.
Keyword: Lexical density, Readability, IELTS, Writing Test

1. Introduction

A writing test serves as a comprehensive assessment tool designed to evaluate an individual's proficiency in expressing themselves through written communication (Shaw & Weir, 2007). This evaluation encompasses a range of critical factors, including grammar, which assesses the accuracy and appropriateness of sentence structure and syntax; vocabulary, which examines the breadth and precision of word choice; coherence, which gauges the logical organization and flow of ideas within the text; and overall writing skills, which encompass the ability to effectively communicate thoughts, convey information, and engage the reader (Brown & Abeywickrama, 2004). Through the analysis of these elements, writing tests provide valuable insights into an individual's linguistic competence, cognitive abilities, and communicative effectiveness, serving as a vital tool for educators, employers, and language professionals in assessing and developing writing proficiency (Weir, 1993). The writing test assesses English language proficiency in areas such as vocabulary, grammar, and coherence. Given that the writing test contains a wealth of lexical information that can be analyzed for its lexical density and readability, this research is essential for understanding the lexical density and readability outcomes of the writing test.

From the explanation above, it can be concluded that in order to acquire the lexical density of text, content words and function words proportion must be calculated. In every sentence, there must be content words and function words. To know the lexical density, we must use the formula by Halliday: LD= the number of content

words/total number of words x 100%. For example: *"People magazine is known for its celebrity interviews, human-interest stories, and pop culture coverage."* The following sentence contains 10 content words and 5 lexical words. The calculation uses the formular above: (10 lexical words) / (15 total words) x 100 = 66.67%.

This study wants to know the IELTS band 4 students' lexical density level by analyzing the content words in their writing results. The writing results in this study made by the students is a report text. This study wants to know the lexical density level in the students' report text. Finally, this study will display the level of students' lexical density to know whether they have high lexical density or low lexical density. However, this study is not calculated the lexical density manually using the formula that's explained in the previous paragraph. The researcher using website-based application name "Analyze My Writing" to know the lexical density level of the students' writing results.

Moreover, readability is defined as the level of ease or difficulty of a text material that can be understood by certain readers for a specific purpose. It quantifies how well and quickly a text conveys meaning to its readers and measures the writing complexity and estimated reading or education level required for comprehension of the text (Ojha et al., 2021).

The readability of a text refers to how easy or difficult it is for readers to understand and comprehend the content. It is often measured based on factors such as sentence length, word complexity, and overall text structure, which can influence the ease with which readers can process and interpret the information presented (Stenner & Stone, 2022).

This study wants to analyze the readability of IELTS band 4 students' writing results. As mentioned above, readability is defined as the level of ease or difficulty of text therefore this study wants to know the level of ease or difficulty of their writing. The method used to know the level of readability is the Flesch Reading Ease Scale (RE = 206,835 – (1,015) x ASL – (84,6 x ASW)).

This study not only contributes to the existing body of knowledge on lexical density and readability but also introduces innovative methodologies for evaluating students' writing proficiency, thereby addressing a significant gap in the current research landscape.

The main objectives of this study is to discover the lexical density and readability level of writing produced by IELTS band 4 students; This study aims to provide comprehensive insight into linguistic complexity and students' understanding of composition. Ultimately, this study sought to determine whether the lexical density and readability of students' writing met the expected standards for IELTS band 4.

2. Literature Review

Previous research by (Pratiwi et al., 2018) investigated the lexical density and readability of English textbooks used in Malaysian secondary schools. They employed Halliday's lexical density formula and Flesch's Reading Ease formula to assess the lexical density and readability of the textbooks, respectively. The results indicated a lexical density ranging from 42.90% to 58%. Based on these findings, the lexical density of the English textbooks in Malaysian secondary schools falls within the range from low (40-50) to quite (50-60). Additionally, the readability scores ranged from 86.6 (easy) to 19.2 (college graduate level).

Research by (Rizkiani et al., 2022) aimed to analyze the lexical density and readability of the "Advanced Learning English" textbook for high school students in Indonesia published by Facil. To assess the lexical density and readability of the textbook, they utilized Halliday's lexical density formula and Flesch's Reading Ease formula, respectively. The lexical density ranged from 57.74% to 65.9%, indicating a level from quite to high. The readability scores were 42.16% and 34.68%, corresponding to a difficulty level classified as undergraduate level.

The research conducted by (Miskiyah, 2021) aimed to analyze the lexical density and readability of texts within an English textbook designed for 11th-grade students, with a specific focus on assessing their suitability for the intended grade level. Lexical density was assessed using Halliday's Lexical Density formula, while readability was evaluated using Flesch's Reading Ease formula. The findings revealed that the average lexical density of the texts was categorized as quite high. Additionally, the average readability level was classified as standard (8th-9th grade). Consequently, it can be inferred that the texts are not suitable for 11th-grade students due to their high lexical density and relatively low readability, more suited for 8th-9th-grade students.

In contrast to previous research endeavors that explored the lexical density and readability of textbooks and educational materials, this study takes a novel approach by focusing on the writing proficiency of IELTS band 4 students. While past studies delved into the lexical density and readability of predetermined texts, this research delves into the actual writing produced by students, specifically in the form of report texts.

A significant departure from conventional methods lies in the assessment process. Unlike prior studies that manually calculated lexical density using established formulas, this study utilizes a website-based application

called "Analyze My Writing" to ascertain the lexical density level of students' compositions. This technological innovation streamlines the evaluation process and potentially offers more accurate and efficient results.

Moreover, while previous research mainly concentrated on assessing the readability of textbooks, this study extends the investigation to scrutinize the readability of students' writing. By employing the Flesch Reading Ease Scale, this research aims to gauge the level of ease or difficulty in comprehending the students' compositions. This expansion of focus from textbook analysis to student-generated content provides valuable insights into the linguistic proficiency and readability of the students' writing.

2.1. IELTS

IELTS, the International English Language Testing System, is a widely accepted proficiency test for English language skills, administered by the British Council, IDP Education, and Cambridge Assessment English. It's divided into two categories: Academic, for higher education, and General Training, for education below degree level or employment purposes in English-speaking countries. The exam evaluates reading, writing, speaking, and listening skills on a 9-band scale, with lower bands indicating basic abilities and higher bands demonstrating advanced proficiency. The assessment criteria include task achievement, coherence, lexical resource, grammatical accuracy, and pronunciation. Lower bands like 1 to 4 represent limited to modest language abilities, with difficulties in understanding and expression, while higher bands such as 7 to 9 showcase operational to expert command of English, with the ability to handle complex language, detailed reasoning, and fluent communication in various contexts (Exam, 2024)

A band score of 4 in IELTS indicates someone who has a basic competence limited to familiar situations. This level of proficiency is characterized by frequent problems in understanding and expression, and the ability to use complex language is absent. The test taker's communication is likely to be restricted to everyday situations and may involve a lot of effort to convey their intended meaning. They may struggle to understand and express themselves in more complex or abstract contexts, and their language use may be marked by inaccuracies and misunderstandings (British Council, 2024).

2.2. Lexical Density

Lexical density refers to the proportion of content words (nouns, verbs, adjectives, and adverbs) in a text compared to function words (pronouns, conjunctions, prepositions, etc.). It is a measure of how much of a text consists of meaningful content versus grammatical or structural elements. In simpler terms, it's a way to gauge how "dense" or packed with meaning a piece of writing is. A higher lexical density suggests that more of the words in a text contribute directly to its meaning, while a lower lexical density indicates that more words are used for structural or grammatical purposes (Halliday & Matthiessen, 2013).

2.3. Content Words

Content words, in the context of lexical density, refer to words that carry substantial meaning or content in a sentence. These include nouns, verbs, adjectives, and adverbs. Content words convey the main message or information in a text, and they contribute directly to its meaning. They are contrasted with function words, such as pronouns, conjunctions, prepositions, and articles, which serve more grammatical or structural purposes and contribute less to the overall meaning of the text. In calculating lexical density, the ratio of content words to total words is often used to measure how much of a text consists of meaningful content (Kyle, 2019).

2.4. Function Words

Function words in lexical density are grammatical building blocks that don't carry significant meaning on their own. Instead, they serve structural roles in sentences. Examples include articles (like "a" and "the"), prepositions (such as "on," "at," and "in"), conjunctions (like "and," "or," and "but"), and auxiliary verbs (e.g., "to be," "do," "have," etc.). These words help shape the sentence's syntax and connect meaningful content (lexical words) together. In essence, function words contribute to the overall structure and coherence of language (Boers, 2021).

3. Method

This study employed a qualitative design with a descriptive qualitative approach. According to Creswell, qualitative research is an inquiry process that delves into social or human problems with the goal of understanding phenomena. The research aimed to determine the level of lexical density and readability of

writing produced by IELTS band 4 students. In descriptive qualitative research, researchers utilize qualitative content analysis to explore the subject matter. Qualitative content analysis is a methodological approach used for the systematic examination of various text types. This study analyzed the writing test results of IELTS band 4 students to gather the necessary data for analyzing the lexical density and readability of the text.

The data collection technique employed in this study was content analysis, a qualitative methodological approach used for the systematic examination of various text types. The texts were subsequently analyzed using the "Analyze My Writing" application to determine the lexical density level, and the Flesch Reading Ease Formula and Scale were utilized to assess readability.

The lexical density level was automatically measured using a web-based application named "Analyze My Writing." Subsequently, the lexical density levels were categorized into high (60-70%), mid (40-60%), and low (<40%). This categorization was also automatically generated by the application.

The readability level was analyzed using the Flesch Reading Ease scale (1948). To measure readability, the writer employed Flesch's Reading Ease formula (1948). Firstly, the writer calculated the ASL (Average Sentence Length), obtained by dividing the total number of words by the total number of sentences. Secondly, the writer calculated the ASW (Average Syllables per Word), determined by dividing the total number of syllables by the total number of words. Thirdly, the researcher computed the readability score using the Flesch's Reading Ease formula based on the calculated ASL and ASW values.

$$RE = 206{,}835 - (1{,}015 \times ASL) - (84{,}6 \times ASW)$$

Last, determine the difficulty level and reading grade by reading ease scale.

Table 1. Flesch Reading Ease Scale

Reading Ease Score	Description	Reading Grade
0-29	**Very Difficult**	**College Graduate**
30-49	**Difficult**	**13^{th} – 16^{th} grade**
50-59	**Fairly Difficult**	**10^{th} – 12^{th} grade**
60-69	**Standard**	**8^{th} – 9^{th} grade**
70-79	**Fairly Easy**	**7^{th} grade**
80-89	**Easy**	**6^{th} grade**
90-100	**Very Easy**	**5^{th} grade**

Source: Courtis et al (2002) in Rizkiani (2022)

4. Result and Discussion

The purpose of this research is to discover the lexical density and readability level of writing produced by IELTS band 4 students; the following passage display and explain the finding of the research.

4.1. Lexical Density in IELTS Band 4 Students' Writing Test

Lexical density refers to the proportion of content words (nouns, verbs, adjectives, and adverbs) in a text compared to function words (pronouns, conjunctions, prepositions, etc.). It is a measure of how much of a text consists of meaningful content versus grammatical or structural elements (Halliday & Matthiessen, 2013). The following table is the lexical density results of ten writing tests by IELTS band 4 students analyzed by "Analyze My Writing" as seen below.

Table 2. Results of Lexical Density

No	Noun	Verb	Adjective	Adverb	Lexical Density score	Lexical Density Level
1	31.1	8.36	10.7	5.69	55.85%	Mid
2	33.01	5.74	5.74	5.26	49.76%	Mid
3	23.72	9.77	6.98	6.51	46.98%	Mid
4	25.71	12.38	10.48	2.86	51.43%	Mid
5	35.22	7.55	10.06	7.55	60.38%	High
6	25.2	8.94	4.07	19.51	57.72%	Mid
7	22.77	8.91	11.88	8.91	52.48%	Mid
8	25.58	8.91	9.3	4.65	48.45%	Mid
9	29.06	8.55	6.84	9.4	53.85%	Mid
10	32.28	12.03	15.82	3.8	63.92%	High

Source: Analyzed by the researcher

As seen above, there are ten writing tests analyzed to get the lexical density level. The level of each students writing tests is different. The table outlines the lexical density results from IELTS student writing tests, ranging from 46.98% to 63.93%, with most falling within the mid-range. Texts 1, 4, and 6 showcase mid lexical density, while Text 5 and 10 stands out with a notably high lexical density, indicating advanced content words. Meanwhile, Text 3 exhibits slightly lower lexical density, and the remaining texts maintain a consistent mid-range density. These results underscore the spectrum of linguistic proficiency among the students, highlighting the importance of lexical density diversity and precision in achieving success in the IELTS writing test.

4.2. Readibility in IELTS Band 4 students' writing test

The table below is the results of text measurement of readability of IELTS band 4 students.

Table 3. Result of Readibility

No	ASL	ASW	Readability (RE)	Description	Reading Grade
1	15.74	1.71	46.25	Difficult	13^{th} – 16^{th} grade
2	17.42	1.47	64.86	Standard	8^{th} – 9^{th} grade
3	17.42	1.48	63.94	Standard	8^{th} – 9^{th} grade
4	17.5	10.97	61.07	Standard	8^{th} – 9^{th} grade
5	30	1.48	51.18	Fairly Difficult	10^{th} – 12^{th} grade

6	14.43	1.49	66.32	Standard	8th – 9th grade
7	21.5	1.41	65.73	Standard	8th – 9th grade
8	39	1.57	34.21	Difficult	13th – 16th grade
9	16.13	1.69	47.49	Difficult	13th – 16th grade
10	15.9	1.74	43.53	Difficult	13th – 16th grade

Source: Analyzed by researcher

The table presents readability results obtained from IELTS student writing tests, showcasing a range of scores and corresponding reading grade levels. Among the texts assessed, the readability scores vary widely, from as low as 34.21 to as high as 66.32. Texts 2, 3, 4, 6, and 7 demonstrate a consistent standard readability level, typically falling within the 8th to 9th-grade range, indicating texts that are relatively easy to comprehend for readers at this educational level. However, Text 8 stands out with a significantly lower readability score of 34.21, indicating a more challenging text suitable for readers at the 13th to 16th-grade level. Conversely, Texts 1, 5, 9, and 10 exhibit higher difficulty levels, with readability scores ranging from 43.53 to 51.18, placing them in the "fairly difficult" to "difficult" categories, suitable for readers at the 10th to 16th-grade level. These readability assessments provide valuable insights into the linguistic complexity and accessibility of the texts produced by the IELTS students, highlighting the importance of tailoring written communication to suit the intended audience's reading abilities.

4.3. Discussion

The research found that the description of the readability level result taken from Flesch Reading Ease Scale. This research examines the lexical density and readability levels of writing produced by IELTS Band 4 students, analyzing ten writing tests. The lexical density ranges from 46.98% to 63.93%, with most falling within the mid-range. Texts 1, 4, and 6 exhibit mid lexical density, while Texts 5 and 10 demonstrate notably high lexical density, indicating advanced content words. Conversely, Text 3 displays slightly lower lexical density. Regarding readability, scores vary widely from 34.21 to 66.32, with Texts 2, 3, 4, 6, and 7 falling within the 8th to 9th-grade range, while Text 8 presents a significantly lower score suitable for higher-grade readers. Conversely, Texts 1, 5, 9, and 10 present higher difficulty levels, suggesting texts suitable for readers at the 10th to 16th-grade levels. These findings highlight the diverse linguistic proficiency and accessibility of IELTS Band 4 student writing, emphasizing the need for tailored communication strategies to suit the intended audience's reading abilities.

This research examines the lexical density and readability levels of IELTS Band 4 student writing, revealing a range of lexical density from 46.98% to 63.93% and readability scores from 34.21 to 66.32 across ten writing tests. Notably, some texts exhibit notably high lexical density, indicating advanced language use. In contrast, others show lower readability levels, suggesting varying levels of text difficulty suitable for different reader grades. This research underscores the diverse linguistic proficiency and accessibility of IELTS Band 4 student writing, emphasizing the need for tailored communication strategies. Comparing with previous research by (Pratiwi et al., 2018) on English textbooks in Malaysian secondary schools, the main research suggests potentially more advanced language use among IELTS Band 4 students, highlighting variations in linguistic characteristics across educational contexts.

This research focuses on analyzing the lexical density and readability levels of writing by IELTS Band 4 students, showcasing findings from ten writing tests with a lexical density range of 46.98% to 63.93%. Notably, Texts 5 and 10 demonstrate notably high lexical density, indicating advanced content words. Regarding readability, scores range widely from 34.21 to 66.32, with Texts 2, 3, 4, 6, and 7 typically falling within the 8th to 9th-grade range. Conversely, Texts 1, 5, 9, and 10 present higher difficulty levels, suggesting suitability for readers at the 10th to 16th-grade levels. These findings underscore the diverse linguistic proficiency and accessibility of IELTS Band 4 student writing, highlighting the need for tailored communication strategies. Comparing with the previous research by (Rizkiani et al., 2022) on Indonesian high school textbooks, the main research suggests potentially lower lexical density and wider variability in readability levels among IELTS Band 4 student writing, indicating differences in linguistic characteristics across educational contexts and emphasizing the importance of understanding audience needs in communication strategies.

This research focuses on analyzing the lexical density and readability levels of writing produced by IELTS Band 4 students, while the previous research by (Miskiyah, 2021) aimed to assess the lexical density and readability of texts within an English textbook designed for 11th-grade students. Both studies employ similar methodologies, utilizing Halliday's Lexical Density formula and Flesch's Reading Ease formula for assessment. However, they differ in their target texts and objectives. While the main research examines IELTS Band 4 student writing, the previous research evaluates texts within an English textbook for 11th-grade students. Despite this difference, both studies reveal significant findings regarding lexical density and readability. The main research indicates a diverse range of lexical density and readability levels among IELTS Band 4 student writing, highlighting the need for tailored communication strategies. In contrast, the previous research suggests that texts within the English textbook designed for 11th-grade students have high lexical density and relatively low readability, potentially indicating a mismatch with the intended audience's proficiency level. These comparisons provide valuable insights into the linguistic characteristics of written materials across different educational contexts and underscore the importance of aligning text complexity with the intended audience's proficiency level.

5. Conclusion

In conclusion, the research conducted aimed to explore the lexical density and readability levels of writing produced by IELTS Band 4 students. The analysis revealed a diverse range of lexical density levels, with most falling within the mid-range but with notable variations among individual texts. Texts 5 and 10 stood out with notably high lexical density, indicating advanced content words, while Text 3 exhibited slightly lower lexical density. Additionally, the readability assessments showed a wide variation in scores, ranging from relatively easy to more challenging texts. While some texts fell within the 8th to 9th-grade readability range, others were more challenging, suitable for readers at higher grade levels. Overall, these findings underscore the spectrum of linguistic proficiency and accessibility among IELTS Band 4 student writing, emphasizing the importance of considering both lexical density diversity and readability levels in tailored communication strategies to suit the intended audience's reading abilities.

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