Corpus Analysis of Spanish L2 Exam-Based Writing: Lexical Analysis and Indications of Translingualism

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ARTICLE INFO	ABSTRACT
	This study examines the corpus analysis of lexical richness and the influence of translingualism among high school students, focusing on exam-based argumentative texts in a supervised setting. Lexical richness is a measure used to evaluate written texts. In assessing students' writings, there is an indication of translingualism, or translanguaging, a phenomenon where language switching occurs due to the influence of another language. The study analyzes 21 texts from Spanish students, categorized into three groups, using lexical variation and sophistication measures, classified under lexical richness and translingualism influence. The research evaluates these criteria by applying AntWordProfiler and Microsoft Excel. The results indicate that differences in lexical diversity/variation between the groups are insignificant. In the analysis of lexical sophistication, it is observed that the use of the Academic Word List (AWL) and the General Service List of the first 1000 words is higher among level 2 students than level 3 students. The study also identifies translingualism in students' texts, influenced by English-Spanish vocabulary similarities. This phenomenon reveals that many misspelled English words are derived from Spanish. Overall, the study provides insights into vocabulary levels, the impact of translingualism, and writing enhancement among high school students.

1. INTRODUCTION

Vocabulary significantly influences second language (L2) learners, as higher vocabulary comprehension leads to smoother communication skills (Uchihara & Saito, 2019). Vocabulary is a key indicator of learners' performance in language acquisition (Juanggo, 2018). In speaking, the depth and variety of vocabulary greatly affect fluency in English as a second language, as understanding and using words predict conversational proficiency (Enayat & Derakhshan, 2021). Vocabulary advancements play a crucial role in reading comprehension, with mid-frequency words being the most critical factor for high-proficiency learners (Masrai, 2019).

Beyond speaking and reading, writing is another skill heavily influenced by vocabulary. Writing relies on using vocabulary to express ideas as a form of communication. The variety of words used directly impacts the quality of written production (Laufer & Nation, 1995). Laufer and Nation (1995) suggest that the more writers understand words, the better and more varied their writings will be. Thus, it is essential to explore the size and depth of vocabulary. Lexical richness is considered reliable for examining writing quality, encompassing analysis of form, meaning, and figurative variations (Chen, 2020). Lexical richness is crucial for distinguishing proficiency levels in student writing. Authentic and accurate measurement of lexical richness can effectively determine and evaluate vocabulary use in writing (Gregori-Signes & Clavel-Arroitia, 2015).

Laufer and Nation (1995) elaborate that lexical richness is a measure used to indicate the quality of written text, focusing on the words produced or lexicons to summarize data results. Lexical richness also measures lexical fluency (Lei & Yang, 2020). Specific measurements of word richness based on Laufer and Nation's (1995) theory include lexical sophistication (LS) and lexical variation (LV), along with lexical originality (LO) and lexical density (LD). Lexical variation, also known as the type/token ratio (TTR), calculates the percentage ratio between different words in a text and the total number of words (tokens). The formula for this calculation is as follows:

$$TTR = \frac{\text{Number of Types}}{Number\ of\ Tokens}x100$$

Lexical originality measures a student's performance index related to the composition of groups formed. As Laufer and Nation (1995) suggested, this index changes if the group changes. The formula is:

$$Lexical\ Originality = \frac{Number\ of\ Unique\ Lexical\ Items}{Number\ of\ Lexical\ Items}x100$$

Lexical density includes nouns, verbs, adjectives, and adverbs when calculating lexicons. The formula is:

$$Lexical\ Density = \frac{Number\ of\ Lexical\ Item}{Total\ Number\ of\ Words}x100$$

Lexical sophistication represents the level of writing advancement by calculating the number of advanced vocabulary items. The formula provided by Laufer and Nation (1995) is:

$$Lexical\ Sophistication = \frac{Number\ of\ Advanced\ Lexical\ Items}{Total\ Number\ of\ Lexical\ Items}x100$$

There are specific classifications to divide lexical sophistication. The first category includes the first 1000 most frequent words and the second 1000 most frequent words. Less fluent students generally use fewer rare vocabulary choices, while advanced students tend to use more academic vocabulary and less frequent words. Coxhead (2000) developed and evaluated the Academic Word List (AWL) for academic purposes. The calculation of lexical sophistication is carried out using various computer applications to analyze data in line with word lists (Laufer & Nation, 1995). Maamuujav (2021) explores richness in terms of lexical diversity, sophistication, and density of adult learners' texts using Coh-Matrix and VocabProfiler. AntWordProfiler (current version 2.1.0), developed by Laurence Anthony, is another tool that can be applied. Lei and Yang (2020) used this program to examine lexical richness in research study journals among advanced English-speaking Chinese students, first-year native English university students, and experts. Ozer and Akbas (2023) used the application to investigate academic words in the veterinary medicine corpus (VMC).

Several studies have investigated lexical richness in various contexts. One study analyzed adult second-language learners' lexical features and richness by examining lexical diversity, sophistication, and density (Maamuujav, 2021). Using computer-based tools such as Coh-Metrix and VocabProfiler indicated low lexical density, high repetition, a significant number of basic words, and a low academic vocabulary. The study showed that low Measure of Textual Lexical Diversity (MTLD) scores indicate less diversity and more repetition of words. Higher MTLD scores suggest better quality with more varied word input. For lexical sophistication, the basic words from the General Service List (GSL) 1-1000 appeared 89.23% of the time, followed by the second tier (GSL 1001-2000) at 4.51%, and academic words at 1.57%.

Table 1. Lexical Sophistication Percentage of Juanggo (2018)

Word List	Level B1			Level B2		
	Token %)	(Type %)	TTR)	(Token %)	(Type %)	(TTR)
1st 1000 most frequent word list	6999 (82.6)	614 (63.5)	0.087	8729 (84.2)	762 (61.9)	0.087
2nd 1000 most frequent word list	423 (5.0)	117 (12.1)	0.277	516 (5.0)	163 (13.2)	0.315
Academic Word List	444 (5.2)	89 (9.2)	0.200	473 (4.5)	115 (9.3)	0.243
Not on the lists	612 (7.2)	147 (15.2)	0.240	652 (6.3)	192 (15.6)	0.294
Total	8478 (100)	967 (100)		10370 (100)	1232 (100)	

At the high school level, another study examined the average number of written texts among students divided into B1-level (15 students) and B2-level (16 students) groups, totaling 31 students (**Table 1**) (Juanggo, 2018). The data on lexical variation showed that B2 students achieved a higher score (0.45) than B1 students (0.43). This result is based on the average number of types in each writing sample: 129 for B1 and 145 for B2, divided by the average number of tokens: 289 for B1 and 319 for B2. Regarding lexical sophistication, B2 students used more common words from the first and second 1000-word lists (84.2% compared to 82.6% by B1 students). The use of academic vocabulary showed that B1-level students had a higher percentage (5.2%) than B2 students (4.5%) in their texts. However, when comparing the types of vocabulary, B2 students showed a slightly higher percentage of academic words (9.3%) compared to B1 students (9.2%).

In addition to the findings of previous studies, other researchers have demonstrated the diversity and sophistication of lexical use in their work. A study conducted in South Korea analyzed the lexical variation in texts from 35 undergraduate students, finding an average of 68.45 words identified as diverse per text. The study revealed that general words (General Word 1 and 2) dominated, with 239.91 and 11.40 words, respectively, compared to an average of 9.77 words from the Academic Word List (AWL). These results were calculated per text to provide a detailed analysis. Another study examined lexical sophistication in veterinary medicine texts. The results indicated that the AWL accounted for 18.18% of the Veterinary Medicine Corpus (VMC).

Although numerous studies have investigated lexical richness, this study addresses some novel aspects. Previous research often used multiple programs, which, while providing comprehensive results, required more time for data analysis. This study, in contrast, employs AntWordProfiler, a more efficient tool. Unlike other studies, this research focuses on exam-based argumentative writing under supervised conditions, analyzing three topics and classifying them into three groups. This study also examines the phenomenon of translanguaging, highlighting its influence on English writing proficiency. The goal is to identify vocabulary gaps or the use of specific words. The findings can help teachers develop targeted vocabulary instruction to enhance students' proficiency in English writing. Additionally, the study explores the impact of translanguaging on English skills, providing insights into the influence of the first language on second language acquisition. To specify the study's significance and objectives, the research questions are as follows:

1. What are the students' levels of vocabulary proficiency based on the percentage of types of lexical richness by groups?
2. How does translingualism influence the students' texts?

Study of Translingualism / Translanguaging

Translingualism, or translanguaging, focuses on practical interaction between people, emphasizing communicative strategies implemented across different languages (Donley, 2022). It is viewed as the synergy of languages to construct new ideas expressed and communicated by speakers using flexible tools that transcend strict language categories (Blommaert, 2021). This approach values the practical use of language, including nonstandard language, to engage effectively with curriculum content. Furthermore, translingualism is a teaching philosophy related to code-meshing and code-switching (Myers-Scotton, 2002). It highlights the dynamic practices in communication by applying diverse language skills simultaneously and flexibly rather than following a fixed set of rules for one language (Donley, 2022).

Studies on translanguaging have found several advantages in language education and applied linguistic contexts. Translingualism is considered a new conceptual idea that views language perspective and bilingualism as valuable and significant. This concept suggests that being multilingual is not isolated, and languages are not easily identifiable in clear-cut categories (Macswan, 2017). Translingualism can enhance language proficiency, thinking, and topic determination, creating a welcoming learning environment for students (Makalela, 2015). In writing, translanguaging forms a method for bilingual students to regulate their language use in writing rather than serving solely as a teaching method (Velasco & Garcia, 2014). This approach can also benefit students aiming for a monolingual writing style. Additionally, a study on a translanguaging-specific writing course in Taiwan found that it leads to better writing quality among students by enabling them to use a broader range of vocabulary and incorporate more general and academic terms (Chen et al., 2019).

2. MATERIAL AND METHOD
Participants

This study involved 21 high school students, all Spanish nationals, with a background in English at the B2 level. The participants included nine male and twelve female students. They were divided into three groups based on their performance in an English course assessment: level 1 (First Certificate in English/FCE 1), level 2 (First Certificate in English/FCE 2), and level 3 (First Certificate in English/FCE 3)

Setting

The participants residing in various regions of Spain were enrolled in an online English course provided by an educational institution based in Indonesia. The course was structured to include virtual classroom sessions, interactive assignments, and periodic assessments to monitor progress. The writing exam, which forms the basis of this study, was conducted through the institution's online learning platform.

To ensure the integrity of the exam, several measures were implemented. Students were required to log in to the platform at a specified time, and their activities were monitored through proctoring software. The webcam was used to supervise them during the exam. The exam environment was designed to replicate standard testing conditions as closely as possible in a virtual setting. Students had a 40-minute time limit to complete their essays, which were automatically submitted through the platform at the end of the allotted time.

Data Collection

A total of 21 essays were collected for analysis. The essays were written during a 40-minute exam in December, at the end of the institution's first academic term. Each essay was required to be between 140 and 190 words and address specific topics relevant to their level:

FCE 1: "Some parents teach their children at home rather than sending them to school. Is it good or bad for the children?"

FCE 2: "Some people say teenagers should spend less time playing computer games. What do you think?"

FCE 3: "Some people say there are more disadvantages than advantages to fame. What do you think?"

Data Cleaning and Preprocessing

Before data analysis, all essays underwent a thorough cleaning process. This process included an initial spell check to identify and correct apparent typos while maintaining the integrity of the original text. Next, the formatting of all essays was standardized, ensuring uniformity in font type, size, and paragraph spacing. Each essay was manually reviewed to meet the word count and topic relevance criteria. Essays that did not meet these criteria were excluded from the analysis.

Data Analysis

This study applied Laufer and Nation's (1995) framework to explore students' vocabulary size and usage in writing. Additionally, the research utilized the Lexical Frequency Profile (LFP) framework and analyses of lexical variation and sophistication. Lexical sophistication measures the advanced use of vocabulary, while lexical variation examines the type/token ratio (TTR). This study also investigated the indication of translingualism, focusing on the relationship between English and Spanish, as Muñoz-Basols and Salazar (2016) theorized. To facilitate these analyses, the study employed a computer program called AntWordProfiler, which provides detailed insights into LFP, lexical variation, and lexical sophistication.

AntWordProfiler

AntWordProfiler (https://www.laurenceanthony.net/software/antwordprofiler/) is designed to profile word range/level and text complexity. The app analyzes students' written texts, covering the General Service List (GSL) first 1000 words, GSL second 1000 words, and the Academic Word List (AWL), including unlisted words. This capability simplifies the analysis of LFP, lexical sophistication, and variation. Lexical sophistication measures the advancement of word levels, while lexical variation evaluates the type-token ratio to determine the diversity of word types used. The study used Microsoft Excel to calculate frequency and word count, presenting the data in numbers and percentages based on the research objectives.

3. FINDINGS

Findings

A total of 4,230 tokens were obtained from the analysis of 21 written texts using the AntWordProfiler app. These tokens were examined regarding lexical variation, sophistication, and Lexical Frequency Profile (LFP). The study focused on exam-based argumentative writing at the B2 level, as defined by the institution. The primary objective was to identify variation and explore the correlation of translingualism. Understanding lexical variation helps teachers develop writing proficiency by providing appropriate vocabulary. The findings about translingualism in second language learning are also discussed.

Lexical Variation/Diversity

Out of the 4,230 tokens analyzed, lexical variation was determined by the percentage of different word types used in the texts (**Table 2**).

Table 2. Lexical variation amongst the three levels of students

Level	Lexical Variation	
	Tokens	Types
1	1375	339
2	1377	418
3	1478	491
TOTAL	4320	1248

A total of 1,248 word types were identified, indicating that the number of tokens is approximately three times greater than the number of types (30%). This suggests limited diversity in the types of words used, with a tendency for repetition. Comparing the three levels, level 3 students exhibited the highest word diversity percentage (33%), followed by level 2 students (25%) and level 1 students (25%). The similarity between level 1 and 2 students reflects their proximity in language proficiency and the nature of the task instructions. These findings support the results of previous studies, such as Maamuujav (2021), which showed a slight difference in data indicating that B2 students achieved better results (0.45) compared to B1 students (0.43).

Lexical Sophistication

Lexical sophistication measures vocabulary implementation according to the General Service Lists (GSL) levels for the first 1000 words and the second 1000 words, the Academic Word List (AWL), and words not included in these lists. **Table 3** below presents the data on applying these four levels of word lists.

Table 3. Lexical Sophistication (Percentage) in students' writing

Lexical Sophistication	Level (Percentage)			Average
	Level 1	Level 2	Level 3	
GSL 1st 1000	89.6	82.06	84.1	85.25
GSL 2nd 1000	4.22	4.36	3.86	4.15
LWA	1.96	6.39	4.87	4.41
Not-in-the-list Words	4.22	7.19	7.17	6.19
Total	100	100	100	100

The data indicates that Level 1 students predominantly use the first 1000 basic words from the GSL in their essays. This is expected, as these students have recently transitioned from the B1 level, according to the CEFR's English assessment. Surprisingly, Level 3 students showed a lower understanding score when using non-basic lexicons, both from the GSL second 1000 words and the AWL, compared to Level 2 students. Specifically, their lexical sophistication in these areas is lower than that of Level 2 students. Additionally, compared to Level 1 students, Level 3 students use a lower percentage of words from the GSL second 1000 list despite having a higher rate of academic words.

Several factors may explain why Level 3 students attain a lower percentage in some contexts, such as the AWL. Anxiety is one of these factors. Research suggests that increased anxiety in writing can negatively affect performance (Wang, 2021; Guvendir & Uzun, 2023). Specifically, Wang (2021) indicates that English learners with lower anxiety tend to perform better in writing. Guvendir and Uzun (2023) further elaborate that higher levels of writing anxiety, or second language writing anxiety (L2WA), lead to a negative impact on writing construction.

This research aligns with the findings of Juanggo (2018) regarding the comparison of students' competencies based on token analysis results, showing a slight difference between B1-graded (5.2%) and B2-graded students (4.5%). However, the results differ when type-based vocabulary data is included and compared, with B2 students having a slightly higher percentage of lexical sophistication (9.3%) than B1 students (9.2%). It is important to note that the levels in this study refer to learning levels, not CEFR-graded levels, as all participants are at the same CEFR level. Additionally, the overall results of lexical sophistication in this study reveal a lower percentage compared to other studies (Maamujav, 2021; Juanggo, 2018; Ha, 2019; Ozer & Akbas, 2024).

Not-in-the-list and Misspelled Words and Translingualism Indication

These contexts are noteworthy due to findings that pertain to a specific linguistic aspect beyond the primary focus of the study, as shown in the following **Table 4**:

Table 4. List of not-in-the-list and misspelled vocabulary percentage

Level	Not-in-the-list/non-listed words		
	Misspelled words	External Terms out of GSL and AWL	Total Non-listed Words
Level 1	21	30	51
Level 2	32	30	62
Level 3	22	55	77
Total	75	115	190
Percentage	39.47	60.53	100

Notably, 190 words, or 4.49% of the analyzed tokens, must be listed. These are divided into misspelled words and external terms not categorized under lexical richness. The data shows that external terms have a higher percentage than misspelled words. However, the section on misspelled words reveals interesting insights related to a linguistic phenomenon. The following **is Table 5.** lists the most frequently misspelled words:

Table 5. List of the most misspelled words

No	Most appeared words	
	Misspelled words	Frequency
1	life	5
2	videogames	5
3	privacity	4
4	enfocated	2
5	perjudicate	2
6	mayority	2
7	excesive	2
TOTAL	7	22

The words "life" and "videogames" appear most frequently. The Spanish language structure influences most of the misspelled words (entries 3-7). This indicates that the Spanish language structure impacts the writing errors in the students' texts. This translingual phenomenon will be discussed further in the Discussion section, detailing how specific words and the influence of Spanish language structure correlate.

4. DISCUSSION

Analysis of Lexical Diversity

The findings of this study reveal significant differences in lexical diversity among the three groups of students, with the highest-level group demonstrating a more diverse use of words. This aligns with the results of previous studies, such as those by Juanggo (2018) and Maamuujav (2021), which also indicated less diverse vocabulary in student writing at lower proficiency levels. Specifically, Laufer and Nation (1995) found that lexical diversity, or the range of words used in a text, strongly indicates language proficiency. Their research emphasized that students with higher proficiency tend to use a broader range of vocabulary, reflecting their greater language competence.

In this study, the highest proficiency group (Level 3) displayed a more varied lexical use than the lower proficiency groups (Levels 1 and 2). This suggests that students at higher proficiency levels can better utilize a more comprehensive array of vocabulary, enhancing the richness and complexity of their writing. The lower diversity observed in the lower proficiency groups aligns with the notion that these students rely more heavily on a limited set of familiar words, resulting in less varied and repetitive language use. These findings are crucial for educators as they highlight the importance of promoting vocabulary development across all proficiency

levels. By encouraging students to expand their lexical repertoire, educators can help improve the overall quality and effectiveness of student writing. Furthermore, the alignment with previous studies reinforces the validity of the current research and underscores the ongoing relevance of lexical diversity as a key metric in language proficiency assessment (Maamujav, 2021).

Analysis of Lexical Sophistication

The analysis of lexical sophistication revealed that all levels of students' texts predominantly used vocabulary from the GSL 1st 1000 words category, showing no significant differences among the three groups. This finding aligns with the results of previous research (Juanggo, 2018). Differences were observed in using GSL 2nd 1000 words, AWL, and vocabulary not included in these lists. The results indicated that Level 2 students demonstrated a higher usage of GSL 2nd 1000 words, AWL, and not-in-the-list vocabulary than Level 3 students. This unexpected finding suggests that Level 2 students possess a more extensive knowledge of advanced vocabulary than their higher-level peers. This partially supports previous research (Juanggo, 2018), which found that lower-level students used more advanced words. The current study, however, differs in that Level 2 students used AWL and not-in-the-list words more frequently than Level 3 students, though the percentage differences were minimal. Several factors might explain these findings. One possible explanation is the variation in curriculum and instructional emphasis at different proficiency levels. Level 2 students might receive more focused instruction on advanced vocabulary as preparation for transitioning to higher proficiency levels. Level 3 students might also focus more on fluency and overall language use, resulting in less frequent use of specialized vocabulary.

The combined average percentage of all students' lexical sophistication in this study was lower than in recent studies involving higher-level texts or students, such as undergraduate texts (Maamujav, 2021; Ha, 2019; Ozer & Akbas, 2024). This is expected due to the difference in target populations. Undergraduate students typically have a broader and more sophisticated vocabulary due to their advanced level of study and exposure to academic texts. The lower percentages observed in high school students highlight the developmental stage of their language acquisition process. When compared to Juanggo's (2018) findings, the percentage of advanced words in this study (4.41%) was slightly lower than the average reported for Indonesian high school students (4.85%). This difference may be attributed to various factors, including differences in educational contexts, instructional quality, and student motivation. It is also possible that the specific nature of the writing tasks and the controlled exam conditions influenced the lexical choices made by the students.

These findings have important implications for language instruction. Educators should know students' different needs and capabilities at various proficiency levels. For lower-level students, there should be a balanced focus on gradually building foundational vocabulary and introducing advanced terms. For higher-level students, instruction should aim to enhance fluency while focusing on expanding their lexical repertoire. These results underscore the need for targeted interventions and differentiated instruction to address students' specific linguistic challenges at different stages of language learning. The analysis of lexical sophistication in this study provides valuable insights into the vocabulary use and proficiency of B2-level high school students. The differences observed among the levels highlight the complexity of language acquisition and the need for tailored instructional approaches to support students' linguistic development.

Phenomenon and Factors of Translingualism (Factors of English-Spanish Connection and Cognates)

The results related to the not-in-the-list section (see subchapter 4.3) indicate a translanguaging process among students. Understanding the relationship between their writing results and the indication of translanguaging requires examining the strong connection between Spanish and English vocabulary. Muñoz-Basols and Salazar (2016) highlight that historical and social factors, mainstream media, technology, language policy, attitudes toward foreign languages, and lexicography significantly influence the vocabulary exchange between English and Spanish. English and Spanish share approximately 20,000 cognates (Montelongo et al., 2009). Cognates are similar words in two languages regarding orthography, semantics, and syntax. This similarity often leads Spanish students to misspell words in English, as their Spanish equivalents influence them. For example, English misspelled words such as "profesional," "dificult," "diferent," "comunication," and "privacity" are derived from the Spanish words "profesional," "difícil," "diferente," "comunicación," and "privacidad," respectively.

The phenomenon of translanguaging, where speakers use elements from multiple languages within a conversation or text, plays a significant role in this context. In bilingual environments, students often draw on their entire linguistic repertoire to communicate effectively, leading to the blending of languages. This process is not merely a sign of confusion or lack of proficiency but a sophisticated strategy reflecting their ability to navigate between languages. Translanguaging offers several educational benefits. It allows students to access their full linguistic and cognitive resources, facilitating deeper understanding and more effective learning. By recognizing the value of translanguaging, educators can create more inclusive and supportive learning environments that acknowledge and build upon the linguistic strengths of bilingual students. The influence of cognates on language learning highlights the importance of teaching strategies that leverage these similarities. Educators can explicitly teach students about cognates, helping them recognize and use these words more effectively. This approach improves vocabulary acquisition and enhances students' confidence in their language abilities.

This study's analysis of not-in-the-list words reveals the practical implications of translanguaging and cognate influence. The presence of misspelled words that closely resemble their Spanish counterparts indicates that students are actively using their knowledge of both languages to construct meaning. This insight can inform instructional practices by encouraging the use of bilingual resources and promoting awareness of cross-linguistic connections. The phenomenon of translanguaging and the influence of cognates play a crucial role in shaping the writing practices of bilingual students. Recognizing and valuing these processes can lead to more effective teaching strategies and a better understanding of bilingual language development. Future research should continue to explore these dynamics, providing further insights into how bilingual students navigate their linguistic environments and how educators can best support their learning.

5. CONCLUSION

This study examined the writing of B2-level students across three groups, focusing on lexical richness and the phenomenon of translingualism, yielding intriguing results. The findings revealed that students at different proficiency levels use varying degrees of lexical variation in their writing. Higher-level students tend to employ a wider variety of words. In contrast, lower-level students sometimes use more advanced vocabulary, as indicated by the GSL 2nd 1000 words analysis and the AWL. The study identified a significant indication of translanguaging in students' Spanish and English vocabulary misspellings. This occurrence is attributed to the similarity between the two languages' vocabulary. Some scholars suggest that translanguaging benefits students by helping them enhance their writing quality through a broader range of words and better self-regulation in language use, as many words in English and Spanish are recognizable and identifiable.

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