VOCABULARY SIZE, LEXICAL DIVERSITY, LEXICAL DENSITY, AND EFL WRITING SCORES: A CROSS-SECTIONAL STUDY[1]

SÖZCÜK DAĞARCIĞI BÜYÜKLÜĞÜ, SÖZCÜK ÇEŞİTLİLİĞİ, SÖZCÜK YOĞUNLUĞU VE İNGİLİZCE YAZMA PUANLARI: KESİTSEL BİR ÇALIŞMA

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ABSTRACT

Vocabulary plays a crucial role in language learning, especially in the context of second language (L2) acquisition. Understanding a word involves grasping its form, meaning, and usage, making vocabulary knowledge pivotal for both receptive and productive L2 skills. This study aims to assess vocabulary size, lexical density, and lexical diversity in argumentative essays written by Turkish English Language Teaching (ELT) students and explore their correlation with writing scores. The data, comprising 309 essays from 165 first-year and 144 fourth-year students at Anadolu University's ELT Department, were analysed using the Lexical Frequency Profile (LFP) to estimate students' productive vocabulary size, vocd-D for lexical diversity, and a lexical density formula. The results revealed that only lexical diversity had a significant correlation with first-year students' essay scores, explaining 7.8% of their performance. However, in the case of fourth-year essays, no significant effects of the variables were observed. Additionally, while the variables accounted for 8.7% of vocabulary scores in first-year essays, they did not significantly explain fourth-year essays' vocabulary scores. Therefore, this study suggests that while lexical features are important, they are not the sole determinants of writing scores.

ÖZ

Kelime bilgisi, dil öğreniminde, özellikle de ikinci dil (L2) edinimi bağlamında çok önemli bir rol oynar. Bir kelimeyi anlamak, onun biçimini, anlamını ve kullanımını kavramayı içerir, bu da kelime bilgisini hem alıcı hem de üretici L2 becerileri için çok önemli hale getirir. Bu çalışmanın amacı, Türk İngilizce Öğretmenliği (ELT) öğrencileri tarafından yazılan tartışmacı kompozisyonlarda sözcük dağarcığı boyutunu, sözcük yoğunluğunu ve sözcük çeşitliliğini değerlendirmek ve bunların yazma puanlarıyla ilişkisini araştırmaktır. Anadolu Üniversitesi İngilizce Öğretmenliği Bölümü'ndeki 165 birinci sınıf ve 144 dördüncü sınıf öğrencisinin 309 denemesinden oluşan veriler, öğrencilerin üretken sözcük dağarcığı boyutunu tahmin etmek için LFP, sözcük çeşitliliği için vocd-D ve bir sözcük yoğunluğu formülü kullanılarak analiz edilmiştir. Sonuçlar, sadece sözcük çeşitliliğinin birinci sınıf öğrencilerinin kompozisyon puanları ile anlamlı bir korelasyona sahip olduğunu ve performanslarının %7,8'ini açıkladığını ortaya koymuştur. Ancak, dördüncü sınıf kompozisyonları söz konusu olduğunda, değişkenlerin anlamlı bir etkisi gözlenmemiştir. Ayrıca, değişkenler birinci sınıf kompozisyonlarındaki kelime bilgisi puanlarının %8,7'sini açıklarken, dördüncü sınıf kompozisyonlarındaki kelime bilgisi puanlarını anlamlı bir şekilde açıklamamıştır. Dolayısıyla bu çalışma, sözcüksel özelliklerin önemli olmakla birlikte, yazma puanlarının tek belirleyicisi olmadığını göstermektedir.

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Introduction

Vocabulary is a critical component of language learning. Research on vocabulary has evolved over the years, with a shift towards exploring its impact on second language (L2) learning since the 1990s. Vocabulary knowledge has been defined in various ways, encompassing aspects like generalization, application, breadth, precision, and availability (Cronbach, 1942). Nation (2000) adds form, meaning, and use to this definition, introducing the terms receptive and productive vocabulary.

The primary aspect of language comprehension and use is frequently regarded as vocabulary (Hunt & Beglar, 2005). The acquisition of a comprehensive vocabulary is a notable obstacle faced by second language (L2) learners, as highlighted by previous research conducted by Nation (1990), Schmitt (1997), and Mokhtar (2010). The absence of a robust lexicon renders effective communication unattainable, as grammatical proficiency alone is insufficient. Current scholarly investigations in the field of second language acquisition (SLA) place significant emphasis on the learning of vocabulary as a fundamental requirement for the development of other language competencies (Gass & Selinker, 2008; Nation, 2006; Roche & Harrington, 2013).

Numerous studies support the connection between vocabulary size and reading and listening comprehension (Nation, 2006; Hu & Nation, 2000). Additionally, L2 learners face difficulties when encountering unknown vocabulary in listening texts (Hamouda, 2013; Solak & Altay, 2014). This deficiency in receptive skills also impacts their productive vocabulary use. The acquisition of a wide range of vocabulary is of utmost importance in order to achieve a high level of competency and fluency in both written and spoken communication (Begriche, 2013; Putra, 2014; Rudy, 2013; Yang, 2015). Numerous academic investigations have demonstrated a significant association between one's proficiency in vocabulary and their ability to talk fluently (Fhonna, 2014; Khotimah, 2014; Perez Manzanilla & Diaz Cabrera, 2014; Tahir, 2015). The aforementioned concerns are interconnected with the extent of productive vocabulary knowledge among second language learners. Vocabulary knowledge plays a pivotal role in L2 learning and affects the competence of learners in both receptive and productive skills. It can be challenging for L2 learners due to its open-ended nature, unlike finite systems like grammar or phonology (Mobarg, 1997).

Vocabulary knowledge encompasses various aspects, and a comprehensive framework by Nation (2000) outlines nine aspects of word knowledge. Lack or deficit in any of these areas can lead to misinterpretation in writing (Folse, 2008).

Defining vocabulary knowledge is crucial, and various definitions exist, which necessitates measurement. Researchers have developed vocabulary tests, employing methods like matching, elicitation tasks, and ordinal scales to evaluate vocabulary knowledge (Gonzalez, 2013). Notable tests include the Vocabulary Knowledge Scale (VKS) (Paribahkt & Wesche, 1993) and the Word Associates Test (WAT) (Read, 1993). However, both tests have faced criticism from scholars like Nation and Webb (2011) and Schmitt and Ng (2011) for their perceived inability to accurately measure vocabulary knowledge. They argue that the VKS's final stage, where learners construct sentences with target words, requires knowledge not only of the target word but also of the surrounding words and syntactic structure.

Waring (2002) highlights interpretation challenges related to VKS scores (see Table 1). For instance, if a learner's pre-test and post-test scores, each consisting of 18 vocabulary items, are similar, as shown in the following example:

Test 1: 1 0 1 0 0 1 2 3 3 2 2 3 4 5 5 4 5 4 = 45/18 = 2.5
Test 2: 3 1 4 5 1 0 2 2 1 4 1 3 4 5 1 5 3 4 = 49/18 = 2.7

As stated by Waring (2002), the interpretation of these ratings presents a considerable challenge. According to Waring (2002), the argument put out is that a comprehensive average score fails to provide any insight into the specific word evaluations that may have been influenced by the treatment, hence indicating a deficiency in the measurement's validity.

Table 1. Vocabulary Knowledge Scale (Paribakht & Wesche, 1993)

Point value	Self-report categories
1 point	I have never seen this word before.
2 points	I have seen this word before, but I don't know what it means.
3 points	I have seen this word before, and I think it means ………… (synonym or translation)[a]
4 points	I know this word. It means ………… (synonym or translation)[b]
5 points	I can use this word in a sentence.[c]

    a.   Learner needs to provide a synonym in English or L1 translation

    b.   Learner needs to provide a synonym in English or L1 translation

    c.   Learner needs to complete number 4 and 5.

Schmitt and Ng (2011) criticize the Word Associates Test (WAT) for its vulnerability to guessing. Figure 1 illustrates a WAT item where learners are required to select words with the closest meaning to the target word "fundamental" from one box and choose common collocations for the target word from another box. This design makes WAT problematic because it does not directly reveal a learner's lexical knowledge (Schmitt & Ng, 2011).
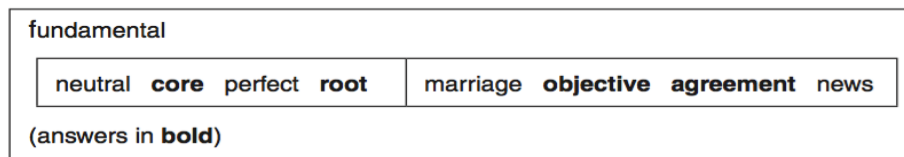

Figure 1: WAT item

Hence, Laufer and Nation (1995) argue that analysing a learner's written productive vocabulary use can provide a more accurate reflection of their vocabulary knowledge. This is because written work showcases the actual vocabulary knowledge employed in production.

Concept Definitions

To enhance the clarity and conciseness of the research questions, it's important to provide brief definitions of key concepts used in the study. These concepts are discussed in detail in the methodology section:

Vocabulary Size: Vocabulary size is the measurement of the number of vocabulary items a person knows across various frequency levels. It is typically assessed using the Lexical Frequency Profile, which categorizes words based on their frequency of use.

Lexical Density: Lexical density refers to the proportion of content words (words carrying meaning) in a written text compared to the total number of words. It is expressed as a percentage and provides insights into the information load of the text. Lexical density can also offer valuable insights into the vocabulary level of learners.

Lexical Diversity: Lexical diversity measures the variety of vocabulary used by a speaker or writer. It provides information about the diversity of productive vocabulary, focusing on the range of words used rather than their frequency.

What sets vocabulary size apart from lexical diversity is that vocabulary size reveals not just the number of words but also the frequency levels of the vocabulary items used in the text. This makes it easier to interpret how learners use high-frequency and low-frequency vocabulary items, among other factors.

Statement of the Problem

According to some scholars (Aliakbari & Boghayeri, 2014; Choi, 2012; Jackson, 2004), the ability to write in a second language is considered to be a crucial skill in the process of language acquisition. Proficiency in writing

is an essential requirement for academic competence, since it constitutes a productive talent alongside speaking. Through the utilization of both skills, students are able to generate tangible outputs that can be evaluated by professors. Numerous studies have indicated that students who are acquiring a second language encounter challenges and encounter difficulties when it comes to the skill of writing. Furthermore, according to Manchon (2011), writing serves as a reflection of learners' language growth, with language development playing a crucial role in supporting the act of writing. Various studies have been conducted to shed light on the factors that impact the quality of writing and the performance of learners. These studies have explored areas such as syntactic complexity (Beers & Nagy, 2007), the influence of the learners' first language (Staples & Reppen, 2016), the types and duration of writing instruction (Min, 2016), as well as linguistic proficiency, which encompasses aspects such as lexical density, diversity, vocabulary size, and grammar. The primary focus of this study will be on the examination and analysis of lexical density, lexical diversity, and vocabulary size. Although some studies argue that these lexical features are strongly associated with the writing proficiency of second language learners and can be used as predictive indicators of their writing achievement (Douglas, 2010; Lemmouh, 2008), other researchers contend that writing achievement cannot be solely attributed to these lexical features (Lavallee & McDonough, 2015; Mellor, 2010; Wang, 2014).

As deBoer (2014) asserts, lexical diversity refers to the extent of word variation observed inside a certain text. Quantitative evaluation of a text is widely recognized as a crucial component, with many applications in linguistic and educational research, including but not limited to language acquisition, linguistic interaction, demographic language performance, and language impairment (Malvern & Richards, 2012). The predictive value of lexical diversity in relation to learners' overall language competency has been acknowledged (Zareva et al., 2005). Additionally, it serves as a crucial indicator of the writing quality (Laufer & Nation, 1995) and speaking abilities (Jarvis, 2002) of learners. The perception of being an essential indication of learners' test performance is generally held. The utilization of lexical diversity measures enables the assessment of a language learner's ability to proficiently incorporate vocabulary into their language production. This aspect holds more significance for language instructors and researchers compared to outcomes obtained through assessments that solely gauge passive vocabulary (Nation, 2007). Understanding the manner in which language learners employ a wide range of vocabulary items in their productive performances is beneficial for language instructors. This comprehension offers valuable perspectives for educators to strategize and facilitate their instructional practices within the classroom setting.

Various formulas exist for quantifying lexical diversity in a given text. It is well acknowledged among researchers that two metrics, namely the Measure of Textual Lexical Diversity (MTLD) and vocd-D (McCarthy & Jarvis, 2010), have demonstrated notable reliability. The website (http://tool.cohmetrix.com/) provides access to MTLD and vocd-D studies. The primary critiques of lexical diversity measures primarily revolve around the influence of text length, whereas MTLD has been demonstrated to be less susceptible to such influence (Koizumi, 2012; McCarthy & Jarvis, 2010).

The Lexical Frequency Profile (LFP) is a method used to calculate vocabulary size, specifically in relation to the vocabulary lists derived from the British National Corpus (BNC) and the Corpus of Contemporary American English (COCA). It determines the number of words contained within a given text that are present in these corpora. The BNC/COCA word family lists comprise a total of 29 lists. Out of the total, 25 lists have been developed utilizing frequency and size statistics, whereas the remaining four lists encompass proper names, marginal words (including swear words and exclamations), transparent compounds, and abbreviations. The website (http://www.lextutor.ca/vp/comp/) offers a means to calculate vocabulary size by using the aforementioned vocabulary lists, namely the BNC/COCA list, the General Service List of English (GSL) words (comprising the 2000 most essential word families in English), and the Academic Word List (AWL) (Coxhead, 2000).

Significance and Aim of the Study

The empirical findings derived from the extensive body of research pertaining to vocabulary knowledge posit that vocabulary knowledge can be delineated into two distinct dimensions, namely receptive and productive (Nation, 2000; Webb, 2005). Henceforth, it is imperative to acknowledge that the comprehension of vocabulary extends beyond a mere quantification of the lexicon possessed by learners, commonly referred to as vocabulary

size. Rather, it is essential to consider the manner in which these lexical units are effectively employed, denoted as productive vocabulary, as elucidated by esteemed scholars such as Meara (2002) and Schmitt et al. (2010). There exist multiple methodologies for assessing the extent of learners' active and passive vocabulary knowledge, including but not limited to Vocabulary Knowledge Tests, Lexical Frequency Profile (LFP) analyses, as well as computations pertaining to lexical density and lexical diversity.

The primary objective of this investigation is to scrutinize the present state of Turkish English Language Teaching (ELT) students through a meticulous analysis of their essays, specifically focusing on the dimensions of vocabulary size, lexical density, and lexical diversity. Furthermore, the primary objective of this study is to ascertain the correlation between these aforementioned concepts and the writing scores of the students. The inquiry at hand pertains to the utilization of productive vocabulary knowledge by L2 learners in the context of their written compositions. The concept of lexical richness, which comprises lexical density, lexical diversity, and vocabulary size, remains an area of limited scholarly investigation (Skehan, 2009). The extant literature on the subject matter of vocabulary knowledge and its influence on second language (L2) skills or academic proficiency is rather limited, as evidenced by the paucity of empirical investigations conducted in this domain (Karakoç, 2016; Yüksel, 2012). Hence the findings derived from this cross-sectional investigation are postulated to make a substantive contribution to the existing body of scholarly literature pertaining to the aforementioned matters, while concurrently offering potential ramifications for pedagogical interventions in the domain of composition courses and the facilitation of lexical acquisition.

In Turkey, students in English Language Teaching (ELT) programs are admitted to the department based on their university entrance exam scores, which primarily consist of 80 multiple-choice questions from a foreign language examination (YDT). Consequently, students at the same university tend to have relatively similar proficiency levels since each university has a specified score range for admission.

It's worth noting that the productive aspect of second language (L2) learning is often overlooked in Turkey's educational system. Turkish high school education places more emphasis on receptive language skills, and the YDT exam predominantly comprises reading comprehension and grammar questions. However, it is expected that a 4-year education in English would naturally enhance the proficiency levels of students, particularly in terms of their productive vocabulary knowledge.

Given this context, this study aims to compare the productive vocabulary usage of 1st-year and 4th-year ELT students and assess its impact on their writing scores. The primary objective is to determine whether a 4-year English-medium education has indeed resulted in an improvement in their productive vocabulary usage in writing within our sample.

To address this research objective, the following research questions are posed:

1. What are the vocabulary size, lexical density and lexical diversity in 1st and 4th year Turkish ELT student essays?
2. Are there any differences between 1st and 4th year ELT students essays in terms of
   a. vocabulary size?
   b. lexical density?
   c. lexical diversity?
3. What is the correlation between
   a. vocabulary size and
      i. the 1st year students' argumentative essay scores?
      ii. the 4th year students' argumentative essay scores?
   b. lexical density and
      i. the 1st year students' argumentative essay scores?
      ii. the 4th year students' argumentative essay scores?
   c. lexical diversity and
      i. the 1st year students' argumentative essay scores?
      ii. the 4th year students' argumentative essay scores?

4. To what extent do vocabulary size, lexical density and lexical diversity account for the essay scores and vocabulary subsection scores of the 1st and 4th year students?

Literature Review

Receptive and Productive Vocabulary Knowledge

Within the domain of second language acquisition, there has been a discernible transition from an emphasis on grammatical aspects to a greater emphasis on vocabulary subsequent to the introduction of the Natural Approach by Krashen (1989). This strategy prioritizes the provision of input that is both comprehensible and meaningful, rather than focusing solely on the accuracy of linguistic structures. The Lexical Approach, as developed by Lewis (1993), emphasized the significant importance of vocabulary in the process of language acquisition. It argued that the ability to comprehend and generate lexical phrases or chunks is crucial for achieving competency in a language. In conventional terms, the act of knowing a word has been characterized by the ability to identify its structure and comprehend its significance upon encountering it. Nevertheless, the concept of word knowledge encompasses other dimensions, as elucidated by Henriksen (1999), Read (2004), and Nation (2001). Richards (1976) made significant contributions to the comprehension of vocabulary knowledge through the presentation of eight fundamental assumptions.

1. Vocabulary continues to expand in adulthood, in contrast to syntax.
2. Knowing a word involves understanding its likelihood of appearing in written or spoken discourse.
3. Vocabulary knowledge encompasses an awareness of its limitations based on variations in function and context.
4. Knowing a word involves understanding its syntactic behaviour.
5. Word knowledge includes comprehension of a word's underlying form and derivations.
6. Knowing a word entails understanding its connections to other words in the language.
7. Word knowledge implies grasping the semantic value of a word.
8. Knowing a word involves recognizing multiple meanings associated with it.

Richards' assumptions consider morphological and syntactic aspects, as well as frequency and register, in defining vocabulary knowledge. One aspect that is absent from this definition is to the differentiation between receptive and productive vocabulary knowledge, as initially proposed by Nation (1990). The aforementioned differentiation might be likened to the categorization of language abilities into receptive skills, encompassing listening and reading, and productive skills, encompassing speaking and writing. Receptive vocabulary knowledge involves recognizing words when heard, familiarity with their written form for reading, understanding affixes and their meaning, recognizing the word's signal for a specific meaning, comprehending the word's meaning in context, awareness of related words, recognizing the word's correct usage in sentences, knowledge of possible collocations, and an understanding of its commonality or pejorative nature (Nation, 2000).

Productive vocabulary knowledge comprises the ability to pronounce words correctly with proper stress, spell them accurately, use the right word forms in various contexts, produce synonyms and antonyms, correctly use the word in the original context, generate collocations, and know where, when, and how often to use the word (Nation, 2000).

While there is no strict boundary between receptive and productive vocabulary knowledge, it is suggested that they are interconnected, with each benefiting from the other (Milton, 2007). Nonetheless, characteristic aspects can be identified for each type of vocabulary knowledge.

This distinction has given rise to questions about the quantity of words one must recognize automatically, the vocabulary size of native speakers, the total number of words in a target language, types of words in a target language, and the methods for measuring this knowledge. Corpus-based studies have contributed significantly to vocabulary research by providing detailed insights into lexical frequency, collocations, chunks, and lexical diversity.

Numerous studies have explored the relationship between vocabulary and other language skills, including receptive and productive knowledge, word frequency, word lists, vocabulary learning strategies (explicit vs. implicit, incidental vs. intentional), and vocabulary testing methods.

In the Turkish context, research has primarily focused on vocabulary teaching techniques and vocabulary learning strategies. Studies examining lexical diversity, lexical density, vocabulary size, dimensions of vocabulary knowledge, and their impact on language skills remain limited. Scholarly research in this particular domain has focused on examining the lexical features present in written texts produced by language learners. In a study conducted by Ünaldı (2011), a comparison was made on the lexical networks of Turkish English as a Foreign Language (EFL) learners. Additionally, Yüksel (2012) examined the overall and academic lexical competence and performance of Turkish students studying English Language Teaching (ELT). According to the findings of Yüksel's research, students who possess a substantial vocabulary size and depth have difficulties in effectively demonstrating their receptive vocabulary knowledge when engaging in essay writing activities.

Measurement of Productive Vocabulary Knowledge

Logically, in light of the multifaceted character of vocabulary, receptive vocabulary knowledge measurement is not adequate to provide a comprehensive depiction of total vocabulary knowledge (Zareva, 2005). Therefore, there has been a shift in focus towards measuring the productive vocabulary knowledge of learners. However, assessing productive vocabulary has its challenges due to its context-specific nature (Lee & Muncie, 2006).

To address the need for measuring productive vocabulary knowledge, Laufer and Nation (1995) introduced the productive version of Vocabulary Levels Tests, which includes sentences with missing words, some letters of which are provided. The validity of the productive version (PVLT) has been established, and it facilitates comparisons between students with varying degrees of proficiency (Laufer, 1998).

Additionally, Laufer and Nation (1995) proposed another measurement method known as the Lexical Frequency Profile (LFP). This method assesses the extent to which learners use vocabulary from various frequency levels in their written work.

In Webb's (2008) study, a translation test was employed to assess the extent of productive vocabulary knowledge. The researcher argues that the Productive Vocabulary Learning Test (PVLT) predominantly captures receptive vocabulary knowledge due to the provision of letters that may aid learners in word recognition.

In an alternative approach, Meara and Fritzpatrick (2000) proposed the utilization of Lex30, a word association test designed to elicit responses from learners by presenting them with a set of stimulus words. This examination is widely regarded as being straightforward to conduct and requiring a relatively little amount of time.

Despite these alternatives, the Lexical Frequency Profile (LFP) remains the most commonly adopted method for measuring productive vocabulary knowledge in vocabulary research, particularly for analysing how learners use vocabulary in their written work.

Lexical frequency profile (LFP)

The Lexical Frequency Profile (LFP), introduced by Laufer and Nation in 1995, serves as a tool for measuring the amount of vocabulary learners use in their writings, particularly in terms of vocabulary size. This technique might also be characterized as a means of assessing the relative distribution of words across different frequency tiers. The original purpose of the Lexical Frequency Profile (LFP) was to evaluate the level of lexical complexity in second language (L2) reading materials. However, it has since become often employed for the calculation of lexical richness using word frequency lists (Utku, 2014).

The Language Frequency Profile (LFP) is a tool used to determine the distribution of words across different categories. The 570 most often used academic words, also known as the Academic Word List (AWL) or University Word List (UWL), the top 1,000 most frequently used words, the next 1,000 most frequently used words based on the General Service List (GSL), and words that do not fit into any of these lists (beyond 2k) are among these categories.

Word frequency lists are considered to be highly helpful tools for conducting vocabulary study. These lists are meticulously constructed with the recognition that certain words exhibit a higher frequency of occurrence compared to others. The first and primary inventory upon which the Lexical Frequency Profile (LFP) is

constructed is the General Service List (GSL), which was compiled by West in 1953 (as cited in Laufer & Nation, 1995). The General Service List (GSL) consists of around 2,000 base words, of which 165 word families are classified as function words, while the remainder words are designated as content words.

What distinguishes GSL from a simple frequency count is its inclusion of different parts of speech and different meanings for each word (Yüksel, 2012). Despite its age, GSL remains valid, as asserted by Nation (2004), who examined its coverage against the BNC.

The University Word List (UWL) was developed by Xue and Nation in 1984, while the Academic Word List (AWL) was compiled by Coxhead in 2000. The AWL comprises words that fall outside the scope of the original 2,000 words in the GSL.

The present study aims to conduct an analysis of essays in order to ascertain the proportions of Academic Word List (AWL) and non-list vocabulary items employed by students. This analysis offers valuable information into the extent of their knowledge regarding productive vocabulary.

It is important to acknowledge that Meara (2005) and Meara and Bell (2001) have expressed criticism towards the LFP, especially due to its reliance on texts over 200 words and potential limitations in its effectiveness with learners at lower proficiency levels. Nevertheless, the authors failed to put out an alternate approach for the analysis of written materials. Laufer (2005) has provided a compelling response to this critique, so solidifying the continued preference for the Lexical Frequency Profile (LFP) as an approach for assessing the lexical richness of texts.

Lexical density

Lexical density (LD) is a metric that quantifies the extent of lexical richness inside a given text, similar to the Lexical Frequency Profile (LFP). The calculation involves determining the ratio of lexical words, which are content words, to the overall number of words in a given written text. According to Johansson (2008), a larger number of content words and a lower proportion of function words in a text suggest a greater amount of information present. The calculation of lexical density is performed by employing the formula as presented in Figure 2.

$$LD = \frac{\text{Number of lexical tokens} \times 100}{\text{Total number of tokens}}$$

Figure 2: LD Formula (Laufer & Nation, 1995, p.309)

It is important to remember that written text's cohesiveness and syntactic qualities have an impact on lexical density. Put differently, the LD measure's validity can be influenced by the quantity of function words present in the text. Therefore, it is typically observed that there is a limited association between LD and the overall proficiency of written expression (Engber, 1995). The primary objective of this study is to examine the validity of the aforementioned assumption through the computation of the link between LD and students' essay scores. These scores will be assessed by two raters utilizing the ESL Composition Profile, a rubric specifically designed for evaluating writing proficiency in English as a Second Language (ESL) learners. Significantly, the raters did not consider LD when allocating scores. Hence, an investigation into the relationship between LD and the given scores will either corroborate or question the conclusions obtained by Engber (1995).

Lexical diversity

The concept of lexical diversity is commonly used to assess the range of vocabulary employed by an individual in their speech or writing. It is frequently considered as an indication of advanced linguistic abilities and proficiency in communication (Avent & Austermann, 2003; Carrel & Monroe, 2004; Grela, 2002). The concept of lexical diversity serves as a means to quantitatively evaluate written material, so providing valuable insights on the utilization of productive vocabulary, as distinguished from receptive vocabulary.

From an intuitive standpoint, there is a prevailing belief that the linguistic repertoire employed by a writer exhibits greater diversity compared to that utilized by a college student in their written compositions. In order to assess the validity of these subjective assessments regarding the quality of text, it is possible to utilize a quantifiable metric. The use of quantifiable knowledge offers an objective and verifiable method for analysing texts (McCarthy, 2005). Consequently, it is possible to formulate predictions and evaluate texts in a scientific manner by employing quantitative metrics, among which lexical diversity serves as a prominent measure. Although lexical diversity may not provide a comprehensive solution to all inquiries pertaining to the quality of a text, it is regarded as a significant instrument for academics and educators.

Although the concept of lexical diversity is generally accepted in linguistics, the measurement of it has raised questions, leading to the introduction of various measurement forms, such as Type-Token Ratio (TTR), the Measure of Textual Lexical Diversity (MTLD), and Vocd-D (vocabulary diversity measure D) (McCarthy, 2005). Disagreements about these measurement forms primarily revolve around the text length's impact on the validity of lexical diversity measures, as longer texts are thought to reduce the possibility of new words appearing (Jarvis, 2002; Malvern et al., 2004). In essence, longer texts may yield less reliable results.

New measurement forms have been presented, all claiming to improve sensitivity, in response to the demand for a more reliable method of measuring lexical diversity. Vocd-D and MTLD are considered more robust methodologies for assessing lexical diversity (Malvern et al., 2004; McCarthy & Jarvis, 2007, 2010), despite the fact that each form claims to be more valid and less affected by text length.

Empirical Studies

The existing body of research has predominantly concentrated on the measurement of lexical diversity, with limited attention given to exploring the correlation between lexical diversity and writing proficiency. A compilation of studies employing lexical diversity, lexical profile, and lexical density computations to examine their association with writing quality is shown in a table (see Appendix 1).

Methodology

The Setting and the Data

The data used in this study were obtained from the ELT Department at Anadolu University in Turkey. In order to be admitted into this program, students must achieve acceptable scores on the English language examination. This examination is a part of a standardized university entrance test administered by the Student Selection and Placement Centre, which is linked with the Council of Higher Education in Turkey. The assessment comprises a total of 80 multiple-choice items, with a predominant emphasis on evaluating reading comprehension and grammatical skills. These items encompass many aspects such as vocabulary comprehension, sentence completion, translation, reading passages, paraphrasing, paragraph completion, and identification of irrelevant sentences within a given passage.

Within the English Language Teaching (ELT) department, students are required to complete two compulsory writing courses within the initial year of their four-year academic program. These courses encompass Written Communication, Academic Writing, and Report Writing. The curriculum of these courses encompasses a range of subjects including paragraph construction, essay development, diverse essay genres (such as opinion, cause and effect analysis, summary-analysis, problem-solution, and argumentative), as well as the utilization of APA style.

In order to get admission into the English Language Teaching (ELT) departments of universities, students are required to attain specific pre-set scores. As an illustration, it is worth noting that in the year 2015, the minimal threshold score mandated for admission into the ELT department at Anadolu University was recorded as 418.598. Although other factors contribute to these scores, it can be posited that students' proficiency levels are very comparable, as they are predominantly decided by their success in the YDS (Foreign Language Exam) and other language proficiency evaluations.

In addition, it is required for students at Anadolu University to successfully complete a preparatory school program, which includes meeting a predetermined competency level, in order to fulfil the exit requirement. The

preparatory school uses the Global Scale of English (GSE) as a means of evaluating the performance of its students. Individuals who successfully attain an A level qualification are required to demonstrate their proficiency by the completion of a comprehensive examination. This examination encompasses many components, such as multiple-choice assessments that evaluate reading and language use abilities, a listening examination, a speaking evaluation, and a writing assessment. In order to progress beyond the preparatory school level, students must achieve a minimum average score of 60 out of 100 on their exams. This finding provides additional evidence that students possess comparable levels of proficiency upon entering the academic institution.

The dataset comprises 309 argumentative essays authored by a total of 165 first-year students and 144 fourth-year students. The students were provided with a prompt to compose an argumentative essay, and the specific topic was picked from the Louvain Corpus of Native English Essays (LOCNESS), which is a collection of 324,304 words of native English essays. The selection of the argumentative essay type and the topic for the study was mostly based on the composition of LOCNESS.

Instruments

To analyse the data and address the research questions, several tools and assessments were employed:

- • The LFP (Lexical Frequency Profile) estimated students' productive vocabulary size. It shows the percentage of words students use from the most frequent 1,000 words, the second 1,000 words (based on the General Service List), the 570 most frequent academic words (AWL), and words not in any of these lists.
- The Vocabulary Diversity Measure (vocd-D) was used to evaluate the lexical diversity of the writings. It assesses text vocabulary diversity. A text lexical analysis website (http://tool.cohmetrix.com/) calculated the value.
- • The Lexical Density Formula calculated the ratio of content words (lexical words) to total words in essays. This shows textual lexical word density.
- The ESL Composition Profile was employed as a means of assessing the essays submitted by the students. The essay is evaluated using this rubric in a number of areas, such as vocabulary, sentence structure, organization, mechanics, content, and usage of discourse markers. The systematic framework it offers makes it easy to assess the essays' quality.

These tools and assessments were used to analyse the essays and provide insights into the students' productive vocabulary knowledge, lexical diversity, and the overall quality of their argumentative essays.

Figure 3. The LFP analysis sample output

Figure 4. Lexical diversity (Vocd-D analysis sample output)
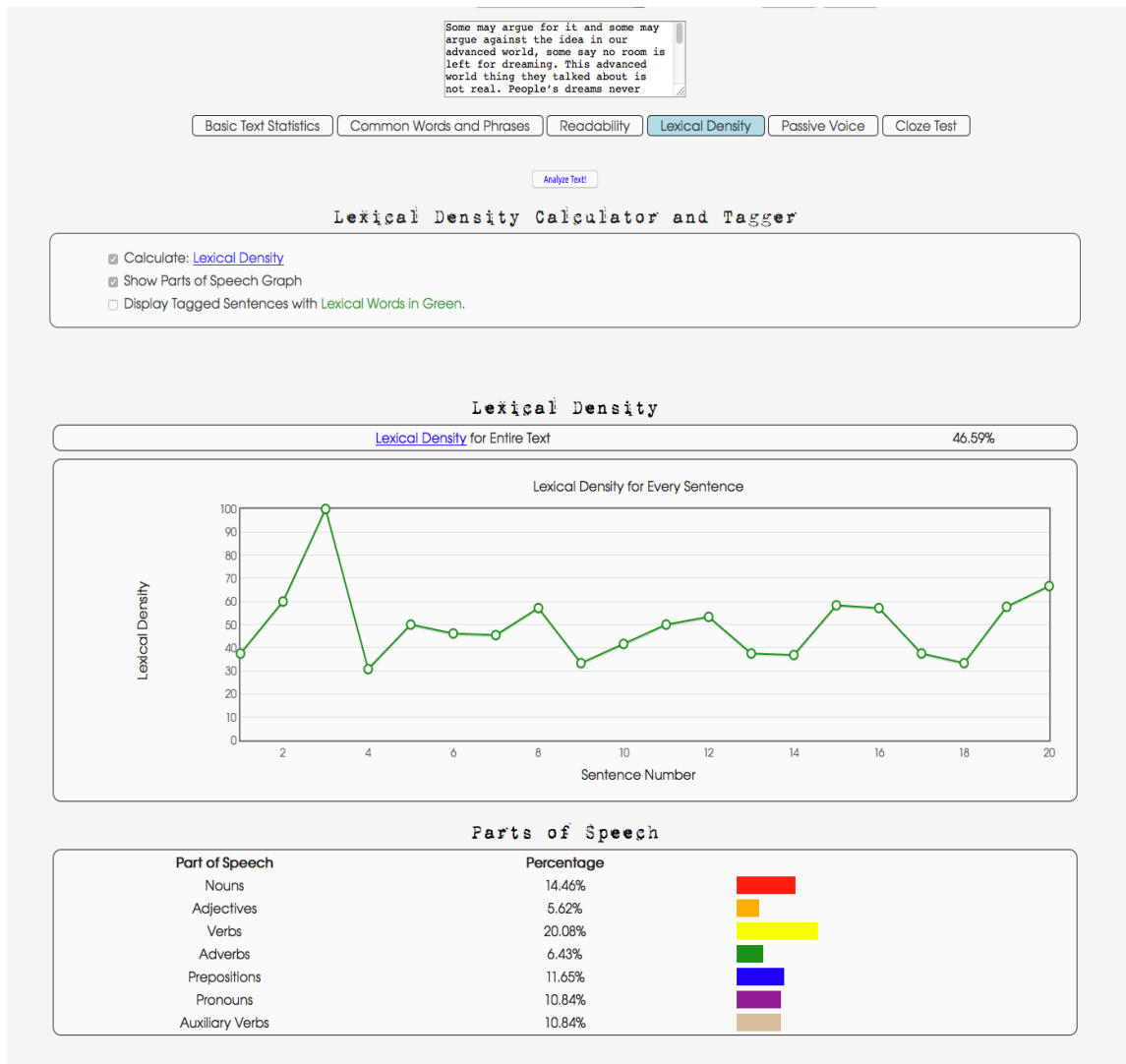
Figure 5. Lexical density analysis sample output

Data Collection Procedure

During the second semester of the 2015-2016 academic year, data collection for this study took place. Essays were obtained from students in both their first and fourth years during their respective class hours, with the consent of their teachers. The first-year students composed their essays in writing courses, while fourth-year students did so in translation courses. Students' participation was voluntary, and they provided informed consent before proceeding. They were allotted 60 minutes to complete their essays, with no access to dictionaries. Afterward, the handwritten essays were digitized for further analysis. Two experienced English instructors, each with six years of teaching experience at state universities, were chosen as raters. These instructors had expertise in teaching writing and were well-acquainted with the ESL Composition Profile, the rubric used for evaluation. Each essay was independently assessed by the two raters across different subsections of the rubric, covering aspects such as content, organization, discourse markers, vocabulary, sentence construction, and mechanics. To determine overall scores for students, the average score from both raters was calculated. The study found a high inter-rater reliability, with a coefficient of .941 for overall scores, demonstrating substantial agreement between the raters. These meticulous steps were taken to ensure a systematic and reliable assessment of the students' essays while maintaining data quality throughout the process.

A website was used to calculate lexical density and diversity, and the findings were all combined onto an Excel file for SPSS analysis. The Lexical Density scores provide an indication of the percentage of content words used

in the examined essay. On the other hand, the lexical diversity scores, which are computed using the Vocd-D formula, offer insights into the range of vocabulary employed in the essay. A higher lexical diversity score indicates a greater variety of words used.

Results and Discussion

Vocabulary Size, Lexical Density and Lexical Diversity of the Students' Essays

Before delving into the dataset analysis, it is essential to consider the students' essay scores, which can provide context for interpreting the research results. Table 2 reveals that 1st-year students, with a mean score of M = 52.703, and 4th-year students, with a mean score of $M = 53.625$, display a minimal difference in writing performance for this specific essay type.

Table 2. Descriptive Statistics of the Essay Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Writing Scores_1	165	17.0	89.5	52.703	13.4577
Writing Scores_4	144	21.5	87.0	53.625	15.1258

Several factors may explain this similarity. Firstly, 1st-year students approached the task as an assignment in their writing courses, possibly leading to more diligent efforts, while 4th-year students composed their essays in translation classes, potentially viewing it as a mandatory task. Curriculum differences also contribute, as 1st-year students focus on foundational language courses, while the 4th year is more methodologically oriented. Moreover, a comparison of students' vocabulary subsection scores shows similar performance, reinforcing the idea that both 1st and 4th-year students scored alike in this writing task. These insights provide a comprehensive context for the analysis.

Table 3. *1st year students' essays (165 essays)*

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words	665 (56.40)	1294 (43.22)	15511 (75.63)	75.63
K-2 Words	296 (25.11)	443 (14.80)	2113 (10.30)	85.93
AWL [570 fams] TOT 2,570	218 (18.49)	330 (11.02)	1204 (5.87)	91.80
Off-List:	??	929 (31.03)	1682 (8.20)	100.00
Total (unrounded)	1179+?	2994 (100)	20510 (100)	≈100.00

Table 4. *4th year students' essays (144 essays)*

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words	708 (55.23)	1425 (44.46)	24626 (81.66)	81.66
K-2 Words	332 (25.90)	500 (15.60)	2263 (7.50)	89.16
AWL [570 fams] TOT 2,570	242 (18.88)	410 (12.79)	1520 (5.04)	94.20
Off-List:	??	870 (27.15)	1748 (5.80)	100.00
Total (unrounded)	1282+?	3205 (100)	30157 (100)	≈100.00

The 1st-year students' essays consist of 20,510 tokens, with 15,511 belonging to K-1 Words, 2,113 to K-2 Words, 1,204 to AWL, and 1,682 tokens falling into the off-list category. They used a total of 2,994 different word types in their essays, resulting in a percentage of 10.17% for the combined use of AWL and off-list words. On the other hand, the 4th-year students' essays comprise 30,157 tokens, including 24,626 from K-1 Words, 2,263 from K-2 Words, 1,520 from AWL, and 1,748 off-list tokens. They used a total of 3,205 types in their essays, with a 10.84% combined usage of AWL and off-list words. While the 4th-year students used a higher number of words in their essays compared to the 1st-year students, the proportions of beyond 2k and academic word usage appear similar between the two groups (see Table 3 and 4).

Upon calculating the lexical density of the data sets, it was determined that they exhibited similar percentages of density. The lexical density of the complete dataset comprising essays from first-year students is 50.8%, whereas for the dataset of fourth-year students, it is 50.76%. The distribution of content words in the dataset from the fourth year is as follows: nouns account for 25.56%, adjectives make up 6.76%, verbs constitute 13.14%, and adverbs represent 5.29%. The distribution of the 1st year data set exhibits a similar pattern: nouns account for 25.38%, adjectives for 6.55%, verbs for 13.2%, and adverbs for 5.67%). The confirmation of Engberg's (1995) assertion regarding lexical density in written and spoken speech is evident in the density scores surpassing 40%.

The Vocd-D formula was employed for the purpose of calculating lexical diversity. The outcomes of this calculation for the given data set are presented in table 5. The calculation of diversity scores is not applicable to essays that contain fewer than 100 words.

Table 5. *Lexical diversity of the data set*

	N	Minimum	Maximum	Mean
Vocd-D	309	0,000	143,492	83.378
Valid N	309			

The Comparison of Vocabulary Size, Lexical Density and Lexical Diversity between 1st and 4th Year Data Sets

To ascertain any disparities in vocabulary size, lexical density, and lexical diversity between essays written by 1st-year and 4th-year students, a set of independent samples t-tests were employed to examine the average variations between these two cohorts. The findings suggest that there is a negligible mean disparity in vocabulary size among the essays, with a mean difference of 0.5982. A statistical analysis was conducted using an independent sample t-test to compare the mean scores of 1st-year essays (M=10.1787) and 4th-year essays (M=10.7769). The results indicated that there was no significant difference in vocabulary use beyond the 2k lists, which represents the vocabulary size in this study. The reason why only vocabulary items beyond 2k lists were considered is that these bands include mostly function words and low proficiency level words. The t-value $(t(307)=2.180)$ and p-value $(p=0.108)$ were obtained from the analysis. This finding indicates that, within our sample, there is a similarity in terms of vocabulary size between essays produced by students in their first year and those in their fourth year.

Table 6. *Descriptive statistics of vocabulary size*

		N	Mean	Std. Deviation	Std. Error Mean
AWL_Off	1stYear	165	10.178	3.432	.267
	4thYear	144	10.776	3.040	.253

Table 7. *Independent samples t-test of vocabulary size*

AWL_Off	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	2.180	.141	-1.611	307	.108	-.598
Equal variances not assumed			-1.624	306.929	.105	-.598

In order to evaluate the disparity in average scores of lexical density between essays written by students in their first year and those in their fourth year, two independent samples t-tests were performed. The t-test findings revealed a mean difference of 0.45896. However, it is important to note that this difference did not reach statistical significance (t(307)=0.461, p=0.869). Hence, it may be inferred that, with respect to lexical density, the two datasets exhibit considerable similarity. According to Engberg (1995), the observation that the percentage of lexical density exceeds 40% indicates that the written discourse in both groups exhibits a substantial degree of lexical density. Further investigation is warranted to explore the correlation between lexical density and the quality of writing. It is noteworthy to notice the observations made by Laufer and Nation (1995) concerning lexical density - The presence of a lower number of grammatical terms in a text does not necessarily indicate a text that is richer or denser in content. Instead, it may be indicative of the level of coherence and word order employed within the text.

Table 8. *Descriptive statistics of LD*

		N	Mean	Std. Deviation	Mean
LD	1st Year	165	51.057	4.180	.325
	4th Year	144	50.981	3.838	.319

Table 9. *Independent samples t-test of LD*

LD	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.461	.497	.165	307	.869	.458
Equal variances not assumed			.166	306.194	.868	.456

The latest t-test was conducted to examine the potential differences between the data sets of first year and fourth-year students in terms of lexical diversity, as measured by the Vocd-D formula. The average score of the first-year data was determined to be M=79.182, while the average score of the fourth-year data was determined to be M=88.187. The t-test results indicated that there was a statistically significant mean difference between two groups (M=-9.005) (t(307)=1.929, p< .01). This implies that the essays produced by fourth-year students show a greater degree of diversity compared to those generated by first-year students, and this trend can be extrapolated to the broader community. The analysis reveals that fourth-year students showed greater diversity in their word choices within their essays in comparison to first-year students, as evidenced by higher mean

scores. According to Malvern et al. (2004), there is a consensus that a higher level of competency is typically associated with greater lexical diversity in a learner's output.

Table 10. *Descriptive statistics of lexical diversity (Vocd-D scores)*

		N	Mean	Std. Deviation	Mean
LD	1st Year	165	79.182	21.410	1.666
	4th Year	144	88.187	22.642	1.886

Table 11. *Independent samples t-test of lexical diversity (Vocd-D scores)*

LD	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.1.929	.166	-3.590	307	.000	-9.005
Equal variances not assumed			-3.577	296.059	.000	-9.005

The Correlational Relationship between Vocabulary Size, Lexical Density, and Lexical Diversity with Essay Scores

Table 12. *Correlation Analysis of 1st year essays*

		Writing Scores_1	LD_1	AWL_Off_1	Vocd-D_1
Writing Scores_1	Pearson Correlation	1	-.057	-.033	.260**
	Sig. (2-tailed)		.465	.670	.001
	N	165	165	165	165
LD_1	Pearson Correlation	-.057	1	.402**	.149
	Sig. (2-tailed)	.465		.000	.056
	N	165	165	165	165
AWL_Off_1	Pearson Correlation	-.033	.402**	1	.120
	Sig. (2-tailed)	.670	.000		.124
	N	165	165	165	165
Vocd-D_1	Pearson Correlation	.260**	.149	.120	1
	Sig. (2-tailed)	.001	.056	.124	
	N	165	165	165	165
**. Correlation is significant at the 0.01 level (2-tailed).					

The findings of the research indicate that there is no statistically significant relationship between lexical density and essay scores ($r= -0.057$, $p > 0.01$), as well as no statistically significant relationship between vocabulary size and essay scores ($r= -0.033$, $p > 0.01$). Nevertheless, a notable but modest positive association exists between lexical diversity and the scores obtained by first-year students in their argumentative essays ($r= 0.260$, $p < 0.01$). This finding suggests a positive correlation between the level of lexical diversity exhibited by students and their performance in argumentative essay writing, with higher levels of lexical diversity being associated with higher marks. The study topic pertaining to the impact of lexical diversity on essay scores aims to investigate the magnitude of the effect size. This will be accomplished through the utilization of multiple regression analysis.

Although not directly relevant to our research inquiries, it is worth mentioning that the study's findings indicate a moderate association between lexical density and vocabulary size among the student participants (r=0.402, p < 0.01). Put simply, there is a positive correlation between the usage of words from the Academic Word List (AWL) and other lists including words beyond the 2k level, and the level of lexical density observed in students' writings.

In contrast to the findings observed among first-year students, the correlation analysis conducted on the essay scores and lexical features of fourth-year students revealed no significant association between lexical density and essay scores (r= -.017, p > .01), vocabulary size and essay scores (r= .069, p > .01), as well as lexical diversity and essay scores (r= .033, p > .01). This implies that the aforementioned lexical traits do not significantly account for the essay results of fourth-year students. There was no observed correlation between lexical diversity and writing scores among fourth-year students.

In the analysis of the data for the fourth year, it was seen that there existed a statistically significant, albeit small, positive association between lexical density and both vocabulary size and lexical diversity. The correlation coefficient for the relationship between lexical density and vocabulary size was found to be -.309 (p < .01), while the correlation coefficient for the relationship between lexical density and lexical diversity was found to be .343 (p < .01). Additionally, a noteworthy weak positive association was observed between the amount of an individual's vocabulary and the diversity of their lexicon (r = .240, p < .01).

Table 13. *Correlation Analysis of 4th year students*

		Writing Scores_4	LD_4	AWL_Off_4	Vocd-D_4
Writing Scores_4	Pearson Correlation	1	-.017	.069	.033
	Sig. (2-tailed)		.840	.411	.695
	N	144	144	144	144
LD_4	Pearson Correlation	-.017	1	.309**	.343**
	Sig. (2-tailed)	.840		.000	.000
	N	144	144	144	144
AWL_Off_4	Pearson Correlation	.069	.309**	1	.240**
	Sig. (2-tailed)	.411	.000		.004
	N	144	144	144	144
Vocd-D_4	Pearson Correlation	.033	.343**	240**	1
	Sig. (2-tailed)	.695	.000	.004	
	N	144	144	144	144
**. Correlation is significant at the 0.01 level (2-tailed).					

The Effect of Lexical Density, Vocabulary Size, and Lexical Diversity on the Essay Scores Vocabulary Scores

The results of the correlation analyses indicate that, of the variables examined, only lexical diversity exhibited a statistically significant influence on the essay scores of first-year students. In order to conduct a more comprehensive examination of the relationship between lexical diversity and student essay scores, separate multiple regression models were performed for both first-year and fourth-year students.

Table 14. *Multiple Regression Analysis for the 1st Year Data (Essay Scores)*

Model	R	R Square	Adjusted Square	R Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.057a	.003	-.003	.003	.537	1	163	.465
2	.058b	.003	-.009	.000	.021	1	162	.886
3	.280c	.078	.061	.075	13.055	1	161	.000

a. Predictors: (Constant), Lexical Density_1
b. Predictors: (Constant), Lexical Density_1, Vocabulary Size_1
c. Predictors: (Constant), Lexical Density_1, Vocabulary Size_1, Lexical Diversity_1

The findings from the regression analysis conducted on the essays of first-year students indicated that the combined influence of the independent variables, namely lexical density, vocabulary size, and lexical diversity, accounted for 7.8% of the variability observed in the essay scores ($R2 = .078$, $F(3,161) = 4.550$, $p < .01$). Nevertheless, within the set of factors examined, it was found that only lexical diversity exhibited a significant relationship with 7.5% of the essay scores ($\beta = .075$, $p < .01$). Conversely, the other variables, namely lexical density and vocabulary size, were shown to have a negligible impact, explaining a non-significant 0.3% of the essay scores.

The findings from the regression analysis conducted on the 4th-year students indicated that there was no significant relationship between the predictors and the essay scores of these students ($F(3,140) = 0.343$, $p > .01$).

In order to examine the potential impact of these lexical traits on the vocabulary scores of students, two distinct multiple regression models were performed for the data collected from first year and fourth-year students. The findings from the regression analysis conducted on the essays of first-year students indicated that 8.7% of the variability in vocabulary scores could be accounted for by the independent variables, namely lexical density, vocabulary size, and lexical diversity ($R2 = 0.087$, $F(3,161) = 14.676$, $p < .01$). Out of the factors examined, it was shown that only lexical diversity had a significant impact on 8.3% of the vocabulary scores ($\beta = 0.083$, $p < .01$). Conversely, the other variables, namely lexical density and vocabulary size, were found to have an insignificant effect, explaining only 0.4% of the variance in vocabulary scores.

Table 15. *Multiple Regression Analysis for the 1st Year Data (Vocabulary Scores)*

Model	R	R Square	Adjusted Square	R Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.060a	.004	-.003	.004	.589	1	163	.444
2	.060b	.004	-.009	.000	.000	1	162	.992
3	.295c	.087	.070	.083	14.676	1	161	.000

a. Predictors: (Constant), Lexical Density_1
b. Predictors: (Constant), Lexical Density_1, Vocabulary Size_1
c. Predictors: (Constant), Lexical Density_1, Vocabulary Size_1, Lexical Diversity_1

On the other hand, the findings from the regression analysis conducted on the 4th-year students revealed that none of the predictors exhibited a statistically significant relationship with the vocabulary scores of these students ($F(3,140) = 0.436$, $p > .01$). The results for the overall essay scores of fourth-year students exhibited a comparable outcome. The table 16 illustrates that the analysis conducted did not yield any statistically significant findings pertaining to the impact of the variable on vocabulary scores among students in their fourth year of study.

The findings reveal that the lexical features in the students' essays exhibit mainly similarities, but one notable difference is that the essays of the 4th-year students show significantly higher lexical diversity than the essays of

the 1st-year students. This suggests that the 4th-year students are capable of using a more diverse range of words in their essays.

Table 16. *ANOVA for the 4th Year Data Regression Analysis (Vocabulary Scores)*

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.018	1	.018	.004	.950[b]
1	Residual	627.309	142	4.418		
	Total	627.326	143			
	Regression	4.873	2	2.437	.552	.577[c]
2	Residual	622.453	141	4.415		
	Total	627.326	143			
	Regression	5.808	3	1.936	.436	.728[d]
3	Residual	621.518	140	4.439		
	Total	627.326	143			

a. Dependent Variable: Vocabulary Scores_4

b. Predictors: (Constant), Lexical Density_4

c. Predictors: (Constant), Lexical Density_4, Vocabulary Size_4

d. Predictors: (Constant), Lexical Density_4, Vocabulary Size_4, Lexical Diversity_4

Conclusion and Suggestions

The results of this study shed light on the challenges faced by Turkish ELT students in the realm of writing. It is evident that both first-year and fourth-year students struggled with writing, as indicated by their notably low average essay scores. Furthermore, the fact that both groups of students produced essays of approximately 200 words on average suggests that they may either lack the motivation to write at length or struggle to meet expected essay lengths. The vocabulary size and lexical diversity scores also reflect their difficulty in expressing themselves in writing, as they made minimal use of words beyond the 1k and 2k word lists. This study underscores the ongoing issues related to writing skills among our students, emphasizing the need for improvement in this productive skill. To establish whether the choice of essay genre had any bearing on the results, a similar research design could be replicated using different essay genres. However, it is evident that in this sample, students encountered challenges in composing argumentative essays on the given topic, providing valuable insights for writing instructors. To address these challenges, more essay assignments with a minimum word limit of 350 words should be assigned to encourage students to write more.

Furthermore, it became evident that students lacked a fundamental understanding of the essay genre. They lost points in the content section of the rubric and the discourse markers section, as they struggled to use appropriate discourse markers for the essay genre. This underscores the necessity for more rigorous and comprehensive writing courses, where essay writing should be a central component integrated throughout the four-year curriculum, with assignments and examinations dedicated to this genre. The two compulsory writing courses in the first year appear to be insufficient, as the students need greater awareness of the significance of effectively expressing their ideas through writing.

Another noteworthy finding from this study is that despite the relatively low level of lexical diversity, it had a significant effect on essay scores. Therefore, there is a case for incorporating a vocabulary course into the curriculum, focusing on raising students' awareness of vocabulary profiles, word lists, and word frequency. As students are not only learners but also future teachers, they should recognize the importance of lexical diversity and productive vocabulary knowledge in both their language learning and teaching endeavours. Enhancing students' vocabulary should be integrated into writing courses through activities like affixation exercises, vocabulary level tests throughout the semester, and paragraph completion exercises. Vocabulary should be considered as a distinct skill alongside grammar, writing, or speaking, and rich vocabulary use should be encouraged, with rewards for students who demonstrate proficiency.

For future studies, it is recommended to include the assessment of receptive vocabulary aspects to complement the assessment of productive vocabulary measures in students' written texts. It would also be valuable to examine students' developmental progress by having them write several essays over an academic year, which would help in understanding their actual productive vocabulary usage. Additionally, the examination papers of students could be employed as data sets to determine whether students wrote their essays attentively and whether the essays genuinely reflect their writing abilities.

To conclude, the study's results suggest that there are conflicting outcomes regarding the impact of lexical features in students' essays on their essay scores and vocabulary scores. Nevertheless, it is evident from the study that raters did not give considerable weight to lexical features when evaluating students' essays, as these features did not seem to directly influence either essay scores or vocabulary scores.

References

Aitkuzhinova-Arslan, A., Gün, S., & Üstünel, E. (2016). Teaching vocabulary to Turkish young learners in semantically related and semantically unrelated sets by using digital storytelling. *Journal of Language and Linguistic Studies*, *12*(1), 42-54.

Aliakbari, M., & Boghayeri, M. (2014). A needs analysis approach to ESP design in Iranian context. *Procedia-Social and Behavioral Sciences*, *98*, 175-181.

Avent, J.R, & Austermann, S (2003). Reciprocal scaffolding: a context for communication treatment in aphasia. *Aphasiology, 17*, 397-404

Basoz, T., & Cubukcu, F. (2014). The effectiveness of computer assisted instruction on vocabulary achievement. *Mevlana International Journal of Education*, *4*(1), 44-52.

Beers, S. F., & Nagy, W. (2009). Syntactic complexity as a predictor of adolescent writing quality: Which measures? Which genre?. Reading and Writing, 22(2), 185–200.

Begriche, F. (2014). The role of teaching vocabulary to enhance foreign language learners' writing skill (Master's Thesis). Retrieved from http://dspace.univ- biskra.dz:8080/jspui/handle/123456789/4741

Biber, D. 2006. University language: A corpus-based study of spoken and written registers. Amsterdam: John Benjamins.

Bogaards, P. (2000) Testing L2 Vocabulary Knowledge at a High Level: the case of the Euralex French Tests. Applied Linguistics, 21 (4), 490-516.

Carrell, P.L., & Monroe, L.B. (1993). Learning styles and composition, *The modern Language Journal*, 77, 148-162.

Choi, J. (2012). Self-Access English Learning Needs: Student and Teacher Perspectives. Listening, 42(49), 15.

Coxhead, A. (2000). A New Academic Word List. TESOL QUARTERLY, 34 (2), 213- 238

Cronbach, L. J. (1942). An analysis of techniques for diagnostic vocabulary testing. *The journal of educational research*, *36*(3), 206-217.

Crossley, S. A., & McNamara, D. S. (2010). Cohesion coherence, and expert evaluations of writing proficiency. In R. Catrambone, & S. Ohlsson (Eds.), Proceedings of the 32nd annual conference of the cognitive science society (pp. 984–989). Austin, TX: Cognitive Science Society.

Çelik, S., & Toptaş, V. (2010). Vocabulary learning strategy use of Turkish EFL learners., Procedia Social and Behavioral Sciences 3, 62-71, http://www.sciencedirect.com/science/article/pii/S187704281001387X

Dang, T. N. Y., & Webb, S. (2013). The lexical profile of academic spoken English. English for Specific Purposes. http://dx.doi.org/10.1016/j.esp.2013.08.001

deBoer, F. (2014). Evaluating the comparability of two measures of lexical diversity. *System*, *47*, 139-145.

Douglas, S. R. (2010). *Non-native English speaking students at university: Lexical richness and academic success* (Doctoral dissertation, University of Calgary).

Ellis, R. (1994) The Study of Second Language Acquisition. Oxford: Oxford University Press.

Ellis, R. & He, X. (1999). The role of modified input and output in the incidental acquisition of word meanings. Studies in Second Language Acquisition, 21, 285- 301.

Engber, C.A. (1995) The relationship of lexical proficiency to the quality of ESL compositions. <u>Journal of Second Language Writing</u> 4, 2: 139-155.

Fhonna, R. (2014). The correlation between mastering vocabulary and speaking ability (case study at SMA 10 Fajar Harapan Banda Aceh). Visipena, 5(1), 90-99.

Folse, K. (2008). Myth 1: Teaching vocabulary is not the writing teacher's job. In J. Reid (Ed.) Writing myths: Applying second language research to classroom teaching (pp.1-17). Ann Arbor: University of Michigan Press.[SEP]

Gass, S. M. & Selinker, L. (2008). *Second language acquisition: An introductory course.*

González, M. C. (2013). *The intricate relationship between measures of vocabulary size and lexical diversity as evidenced in non-native and native speaker academic compositions* (Doctoral dissertation, University of Central Florida Orlando, Florida).

Gregori-Signes, C., & Clavel-Arroitia, B. (2015). Analysing Lexical Density and Lexical Diversity in University Students Written Discourse. *Procedia-Social and Behavioral Sciences*, *198*, 546-556.

Grela, Bernard G. (2002). Lexical verb diversity in children with Down syndrome. *Clinical Linguistics & Phonetics, 14*, 251-263

Hamouda, A. (2013). An investigation of listening comprehension problems encountered by Saudi students in the EL listening classroom. International Journal of Academic Research in Progressive Education and Development, 2(2), 113-155.

Henriksen, B. (1999) Three dimensions of vocabulary development. Studies in Second Language Acquisition 21: 303-317

Hu, M., & Nation, I. S. P. (2000). Unknown vocabulary density and reading comprehension. Reading in a Foreign Language, 13(1), 403–430.

Hunt, A., & Beglar, D. (2005). A framework for developing EFL reading vocabulary. *Reading in a Foreign language*, *17*(1), 23.

Hulstijn, J. and B. Laufer. 2001. Some empirical evidence for the Involvement Load Hypothesis in vocabulary acquisition. Language Learning 51: 539-558

Jackson, M. E., (2004). Will electronic journals eliminate the need for ILL?, Interlending & Document Supply, 32(3), 192-193.

Jarvis, S. (2002). Short texts, best-fitting curves and new measures of lexical diversity. *Language Testing 19*, 1: 57–84.

Johansson, V. (2008). Lexical Diversity and Lexical Density in Speech and Writing: A Developmental Perspective. Working Papers, Lund University, Dept. of Linguistics and Phonetics. 53. pp. 61-79.

Karakoç, D. (2016). *The Impact Of Vocabulary Knowledge On Reading, Writing And Proficiency Scores Of B2.2 Level Turkish Students: A study with Anadolu University English Prep-School Students*, (Unpublished MA Thesis), Graduate School of Educational Sciences, Anadolu University, Eskişehir.

Khotimah, S. (2014). The use of problem based learning to improve students' speaking ability. ELT Forum: Journal of English Language Teaching, 3(1), 50-56.

Koizumi, R. (2012). Relationships between text length and lexical diversity measures: can we use short texts of less than 100 tokens. *Vocabulary Learning and Instruction*, *1*(1), 60-69.

Kök, İ. & Canbay, O. (2011). An experimental study on the vocabulary level and vocabulary consolidation strategies, *Procedia Social and Behavioral Sciences* 15, p. 891-894.

Krashen, S. (1989). We acquire vocabulary and spelling by reading: Addition evidence for theinput hypothesis. Modern Language Journals, Vol. 73, 440-464.

Laufer , B. (1997) The Lexical Plight in Second Language Reading in J. Coady and T. Huckin (Eds) Second Language Vocabulary Acquisition and Pedagogy Cambridge CUP, 140-55

Laufer, B. (1998). The development of passive and active vocabulary in a second language: same or different? Applied Linguistics 12: 255-271.

Laufer, B. (2005). Lexical frequency profiles: From Monte Carlo to the real world: A response to Meara (2005). *Applied Linguistics*, *26*(4), 582–588.

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. Applied Linguistics, 22: 1-26.

Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied linguistics*, *16*(3), 307–322.

Laufer, B., & Nation, P. (1999). A vocabulary-size test of controlled productive ability. *Language testing*, *16*(1), 33–51.

Lavallée, M., & McDonough, K. (2015). Comparing the Lexical Features of EAP Students' Essays by Prompt and Rating. *TESL Canada Journal*, *32*(2), 30-44.

Lee, S. H., & Muncie, J. (2006). From receptive to productive: Improving ESL learners' use of vocabulary in a postreading composition task. *TESOL Quarterly*, *40*(2), 295–320.

Lemmouh, Z. (2008). The relationship between grades and the lexical richness of student essays. *Nordic Journal of English Studies*, *7*(3), 163-180.

Lenko-Szymanska, A. (2002). How to trace the growth in learners" active vocabulary: A Corpus-based study, in B. Ketteman and G. Marko (eds.) Teaching and Learning by Doing Corpus Analysis. Amsterdam: Rodopi. pp. 217-230.

Lewis, M. (1993). *The lexical approach* (Vol. 1, p. 993). Hove: Language Teaching Publications.

Ling, G. U. I. (2015). Predictability of vocabulary size on learners' EFL proficiency: Taking VST, CET4 and CET6 as instruments. Studies in Literature and Language, 10(3), 18-23. http://dx.doi.org/10.3968/6679

Malvern, D.D. and Richards, B.J. 1997: A new measure of lexical diversity. In Ryan, A. and Wray, A., editors, *Evolving models of language*. Clevedon: Multilingual Matters, 58–71.

Malvern, D., Richards, B. J., Chipere, N., & Durán, P. (2004). Lexical diversity and language development: Quantification and assessment: New York: Palgrave Macmillan.

Malvern, D., & Richards, B. (2012). Measures of lexical richness. *The Encyclopedia of Applied Linguistics*.

Manchón, R. M. (2011). Learning-to-write and writing-to-learn in an additional language. Amsterdam: John Benjamins.

Mazgutova, D., & Kormos, J. (2015). Syntactic and lexical development in an intensive English for Academic Purposes programme. *Journal of Second Language Writing*, *29*, 3-15.

McCarthy, P. M. (2005). An assessment of the range and usefulness of lexical diversity measures and the potential of the measure of textual, lexical diversity (MTLD). *Dissertation Abstracts International*, *66*, 12.

McCarthy, P. M., & Jarvis, S. (2010). MTLD, vocd-D, and HD-D: A validation study of sophisticated approaches to lexical diversity assessment. *Behavior research methods*, *42*(2), 381-392.

Meara, P. (2002) The rediscovery of vocabulary. <u>Second Language Research</u> 18, 4: 393-407. [1.4

Meara, P. (2005). Lexical frequency profiles: A Monte Carlo analysis. *Applied Linguistics 26*(1), 32-47.

Meara, P. & Fitzpatrick, T. (2000). Lex30: an improved method of assessing productive vocabulary in an L2. System 28: 19–30.

Meara, P., & Bell, H. (2001). P_Lex: A simple and effective way of describing the lexical characteristics of short L2 texts. *Prospect, 16*, 5-19.

Mellor, A. (2011). Essay length, lexical diversity and automatic essay scoring. *Memoirs of the Osaka Institute of Technology*, *55*(2), 1-14.

Milton, J. (2007) `Lexical profiles, learning styles and the construct validity of lexical size tests', in Daller, H., Milton, J., and Treffers-Daller J. (eds.) Modelling and assessing vocabulary knowledge.Cambridge:CambridgeUniversity Press,pp.47-58.

Min, H. T. (2016). Effect of teacher modeling and feedback on EFL students' peer review skills in peer review training. *Journal of Second Language Writing*, *31*, 43-57.

Mobarg, M. (1997) Acquiring, teaching and testing vocabulary. <u>International Journal of Applied Linguistics</u> 7, 2: 201-222. [1.3

Mokhtar, A. A. (2010). Achieving Native-like English Lexical Knowledge: The Non- native Story. Journal of Language Teaching and Research, Vol. 1, No. 4, pp. 343-352

Nation, P. (1990). Teaching and Learning Vocabulary: Boston: Heinle & Heinle.

Nation, P. (1995). The Word on Words: An Interview with Paul Nation. Interviewed by N. Schmitt. The Language Teacher 19 (4), 5-7

Nation, I. S. P. (2000) Learning Vocabulary in Another Language. Cambridge: Cambridge University Press.

Nation, P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review/La Revue Canadienne des Langues Vivantes*, *63*(1), 59–82.

Nation, I. S. P. (2007). The four strands. Language Learning and Teaching, 1(1), 1-12.

Nation, I.S.P. & Webb, S. (2011). Researching and analyzing vocabulary. Boston: Heinle-Cengage.

Paribakht, T. S., & Wesche, M. B. (1993). Reading comprehension and second language development in a comprehension-based ESL program. *TESL Canada journal*, *11*(1), 09-29.

Pérez Manzanilla, I. S., & Díaz Cabrera, K. M. (2014). Factors that may have an impact on advanced EFL students' speaking ability (Master's Thesis). Retrieved from http://cdigital.uv.mx/handle/123456789/35250

Putra, A. R. (2014). Using picture series to improve the writing skill on recount of 8th graders SMP Muhammadiyah 3 Depok in the 2013–2014 Academic Year (Doctoral dissertation). Retrieved from http://eprints.uny.ac.id/id/eprint/18475

Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. Language Testing, 10, 355-371.

Read, J. (2004). Research in Teaching Vocabulary. Annual Review of Applied Linguistics. pp. 146-161

Richards, J. C. (1976). The role of vocabulary teaching. TESOL Quarterly, 10, 77-89.

Roche, T., & Harrington, M. (2013). Recognition vocabulary knowledge as a predictor of academic performance in an English as a foreign language setting. *Language Testing in Asia*, *3*(1), 12.

Rudy, M. (2013). EFL Writing strategies of the second year students of SMPIT Daarul 'Ilmi Kemiling Bandar Lampung. Paper presented at International Conference on Education and Language (ICEL), Bandar Lampung University.

Schmitt, N. (1997). „Vocabulary learning strategies." In N. Schmitt and M. McCarthy, (Eds.), Vocabulary: Description, Acquisition and Pedagogy 199-227. Cambridge University Press, Cambridge.

Schmitt, N. (2000). Vocabulary in Language Teaching. Cambridge: CUP

Schmitt, N. (2010). Researching Vocabulary: A vocabulary research manual. New York: Palgrave MacMillan.

Schmitt, N., Ching, Ng, J. W & Garras, J. (2010). The Word Association Format: Validation Evidence. Language Testing, online. 1-22.

Silverman, R. D., Proctor, C. P., Harring, J. R., Hartranft, A. M., Doyle, B., & Zelinke, S. B. (2015). Language skills and reading comprehension in English monolingual and Spanish–English bilingual children in grades 2–5. Reading and Writing, 28(9), 1381-1405. http://dx.doi.org/10.1007/s11145-015-9575

Skehan, P. (2009). Lexical performance by native and non-native speakers on language-learning tasks. In *Vocabulary Studies in First and Second Language Acquisition* (pp. 107-124). Palgrave Macmillan UK.

Solak, E., & Altay, F. (2014). Prospective EFL teachers' perceptions of listening comprehension problems in Turkey. Journal of International Social Research, 7(30).

Staples, S., & Reppen, R. (2016). Understanding first-year L2 writing: A lexico-grammatical analysis across L1s, genres, and language ratings. *Journal of Second Language Writing,* 32, p.17-35.

Tahir, S. Z. (2015). Improving students' speaking skill through voice chat at University of Iqra Buru. Journal of Modern Education Review, 5(3), 296-306. http://dx.doi.org/10.15341/jmer(2155-7993)/03.05.2015/009

Topkaraoğlu, M., & Dilman, H. (2013). Effects of Studying Vocabulary Enhancement Activities on Students' general Language Proficiency Levels. *Batı Anadolu Eğitim Bilimleri Dergisi*, *2013*(8).

Unaldi, I. (2011). A comparative investigation of lexical networks of Turkish learners of English as a foreign language: A corpus based study. *Unpublished doctoral dissertation, Cukurova University, Adana, Turkey.*

Utku, R. (2014). *Meta-analysis of the Lexical Frequency Profile* (Unpublished MA Thesis), The University of Queensland School of Languages and Comparative Cultural Studies Brisbane, Australia

Vandergrift, L., & Baker, S. (2015). Learner variables in second language listening comprehension: An exploratory path analysis. Language Learning, 65(2), 390- 416. http://dx.doi.org/10.1111/lang.12105

Wang, S. (2015). An empirical study on the role of vocabulary knowledge in EFL listening comprehension. Theory and Practice in Language Studies, 5(5), 989- 995. http://dx.doi.org/10.17507/tpls.0505.14

Wang, X. (2014). The relationship between lexical diversity and EFL writing proficiency. *University of Sydney Papers in TESOL*, *9*.

Waring, R. (2002). Basic principles and practice in vocabulary instruction. The Language Teacher. Retrieved in June, 2016, from http://jalt-publications.org/old_tlt/articles/2002/07/waring

Webb, S. (2005). Receptive and productive vocabulary learning: The effects of reading and writing on word knowledge. Studies in Second Language Acquisition, 27: 33-52.

Webb, S. (2008). Receptive and productive vocabulary size. Studies in Second Language Acquisition. Vol. 30. pp. 79-95

Webb, S., & Nation, P. (2008). Evaluating the vocabulary load of written text. *TESOLANZ Journal*, *16*, 1–10.

Wesche, M. & Paribakht, T.S. (1996). Assessing second language vocabulary knowledge: Depth versus breadth. Canadian Modern Language Review, 53: 13- 40.

Xue, G., & Nation, I. S. P. (1984). A university word list. Language Learning and Communication, Vol. 3, p. 215–299.

Yang, Y. I. (2015). An investigation of Chinese junior high school teachers' and students' attitudes towards EFL writing. International Journal of Research Studies in Education, 5(2). http://dx.doi.org/10.5861/ijrse.2015.1209

Yüksel, İ (2012) *Cross-sectional evaluation of general and academic lexical competence and performance.* (Doctoral Dissertation). Anadolu University, Eskişehir, Turkey.

Zareva, A. (2005). Models of L2 learners" vocabulary knowledge assessment. System, 33 (4), 547–562.

Zareva, A., Schwanenflugel, P., Nikolova, Y. (2005). Relationship between lexical competence and language proficiency: Variable sensitivity. Studies in Second Language Acquisition, 27 (4), 567-595.

Zhang, J., McBride-Chang, C., Wong, A. M. Y., Tardif, T., Shu, H., & Zhang, Y. (2014). Longitudinal correlates of reading comprehension difficulties in Chinese children. Reading and Writing, 27(3), 481-501. http://dx.doi.org/10.1007/s11145-013-9453-4

APPENDIX 1

Table 2. Empirical Studies

Study	Aim	Tools	Related Findings
Laufer & Nation (1995) — Vocabulary Size and Use: Lexical Richness in L2 Written Production	To find out if there is a correspondence between the vocabulary size of intermediate learners as reflected in their writing and a more direct measure of vocabulary size.	LFP	• It is possible to get a reliable and stable measure of lexical richness in two writings of the same learner. • The LFP can discriminate between learners of different proficiency levels. • The LFP has a correlation with an independent measure of vocabulary size.
Lemmouh (2008) — The Relationship Between Grades and the Lexical Richness of Student Essays	To examine the relationship between Swedish university students' essay grades and lexical richness.	• VLT • PVLT • LFP	• The LFP can be used as a diagnostic tool to identify students with poor vocabulary knowledge. • Students using more academic and low-frequency vocabulary, determined by the LFP, are more successful writers.
Douglas (2010) — Non-Native English Speaking Students at University: Lexical Richness and Academic Success	To measure the lexical richness of non-native and native English speaking students and compare them to academic outcomes.	• TTR • Effective Writing Test (EWT)	• Lower measures of lexical richness seemed to affect the assessment of writing exams. • Students with higher lexical richness performed better in EWT.
Mellor (2010) — Essay Length, Lexical Diversity and Automatic Essay Scoring	To investigate if essay length and lexical diversity together may replace essay ratings. To determine which lexical diversity measure is better.	• TTR • Guiraud's Index • Yule's K • VocD • Hapax • Advanced Guiraud	• Essay length was found to be the dominant predictor of essay ratings, while lexical diversity had a relatively little effect. • Advanced Guiraud was the best in clearly identifying the high rated and low rated essays.
Yüksel (2012) — Cross-sectional Evaluation of Turkish ELT Majors' General and Academic Lexical Competence and Performance	To evaluate the general and academic lexical competence and performance of Turkish ELT students.	• VLT • WAT • Test of Academic Vocabulary • TTR • LFP	• Students have large vocabulary size and depth (receptive vocabulary knowledge). • Students cannot use their receptive vocabulary knowledge in production. • LFP is reliable in assessing lexical diversity in students' argumentative essays. • Students' vocabulary knowledge increases across the years but their lexical competence and performance do not increase in the same manner.
Gonzalez (2013) — The Intricate Relationship Between Measures Of Vocabulary Size And Lexical Diversity As Evidenced In	To find out to what extent vocabulary size and lexical diversity contributes to writing scores on advanced non-native and native speakers' academic compositions.	• MTLD • VocD • CELEX (Word Frequency Means)	• Lexical diversity has more impact on writing score than vocabulary size.

Table 2. (Continued) *Empirical Studies*

	Non-Native And Native Speaker Academic Compositions			• Native speakers' lexical diversity and vocabulary size profiles significantly differ from non-native speakers'. • Vocabulary size has moderate correlation with lexical diversity, which shows that mid-size vocabulary may be more important in writing than using less frequency vocabulary.
Wang (2014)	The Relationship between Lexical Diversity and EFL Writing Proficiency	To explore the relationship between lexical diversity and EFL writing proficiency	• Chinese National Matriculation English Writing Test • TTR • VocD	• There is not a significant relationship between the lexical diversity measures and the students' writing scores. • Lexical diversity of high graded students does not differ from the lexical diversity of low graded students.
Mazgutova & Kormos (2015)	Syntactic and Lexical Development in an Intensive English for Academic Purposes Programme	To show the syntactic and lexical development of L2 learners' academic writing after a one-month intensive English for Academic Purposes programme.	• Two argumentative essays written at the beginning and at the end of the programme. • MTLD • CELEX	• The students showed improvement with regard to lexical diversity in their essays. • Students began using more advanced vocabulary, a characteristics of academic context after the programme.
Lavallee & McDonough (2015)	Comparing the Lexical Features of EAP Students' Essays by Prompt and Rating	To examine the relationships among the lexical features (AWL word use, content word frequency, word familiarity, imagability, lexical diversity) of students' essays, essay writings, and writing prompts	• MTLD • Coh-Metrix • AWL • TOEFL Writing Rubric	There is no significant correlation between essay ratings and lexical features.
Signes & Arroitia (2015)	Analysing Lexical Density and Lexical Diversity in Unviersity Students' Written Discourse	• To determine if writing quality assessment based on LFP is valid. • To see if there is development in lower level students' writings in a semester.	• LFP • Textalyser (LD analysis)	LFP provided stable measure of lexical richness in two writings of the same learner.
Karakoç (2016)	The Impact of Vocabulary Knowledge on Reading, Writing and Proficiency Scores of B2.2 Level Turkish Students	To demonstrate the multidimensional nature of vocabulary knowledge development and its relation to the students' reading and writing performance together with the general English ability.	• LFP • VKT • Reading and Writing exam	• The students' receptive vocabulary knowledge is larger than the productive vocabulary knowledge. • Vocabulary knowledge contributes significantly to reading and writing performances of the students. • There is a correlation between the lexical level of the student essays and students' productive vocabulary knowledge.

GENİŞLETİLMİŞ ÖZET

Kelime bilgisi, dil öğreniminde, özellikle de ikinci dil (L2) edinimi bağlamında çok önemli bir rol oynar. Bir kelimeyi anlamak, onun biçimini, anlamını ve kullanımını kavramayı içerir, bu da kelime bilgisini hem alıcı hem de üretici L2 becerileri için çok önemli hale getirir. Bu çalışmanın amacı, Türk İngilizce Öğretmenliği (ELT) öğrencileri tarafından yazılan tartışmacı kompozisyonlarda sözcük dağarcığı boyutunu, sözcük yoğunluğunu ve sözcük çeşitliliğini değerlendirmek ve bunların yazma puanlarıyla ilişkisini araştırmaktır.

Anadolu Üniversitesi İngilizce Öğretmenliği Bölümü'ndeki 165 birinci sınıf ve 144 dördüncü sınıf öğrencisinin 309 denemesinden oluşan veriler, öğrencilerin üretken sözcük dağarcığı boyutunu tahmin etmek için LFP, sözcük çeşitliliği için vocd-D ve bir sözcük yoğunluğu formülü kullanılarak analiz edilmiştir. Sonuçlar, sadece sözcük çeşitliliğinin birinci sınıf öğrencilerinin kompozisyon puanları ile anlamlı bir korelasyona sahip olduğunu ve performanslarının %7,8'ini açıkladığını ortaya koymuştur. Ancak, dördüncü sınıf kompozisyonları söz konusu olduğunda, değişkenlerin anlamlı bir etkisi gözlenmemiştir. Ayrıca, değişkenler birinci sınıf kompozisyonlarındaki kelime bilgisi puanlarının %8,7'sini açıklarken, dördüncü sınıf kompozisyonlarındaki kelime bilgisi puanlarını anlamlı bir şekilde açıklamamıştır. Dolayısıyla bu çalışma, sözcüksel özelliklerin önemli olmakla birlikte, yazma puanlarının tek belirleyicisi olmadığını göstermektedir.

Bu çalışmanın bulguları, yazma yeterliliğinde sözcüksel çeşitliliğin önemini vurgulayan önceki araştırmalarla tutarlıdır. Örneğin, Nation (1990) sözcüksel çeşitliliğin L2 öğrencileri arasında yazma başarısının güçlü bir yordayıcısı olduğunu bulmuştur. Benzer şekilde, Schmitt (2000) sözcük çeşitliliğinin etkili iletişim için gerekli olduğunu, çünkü yazarların fikirlerini daha kesin bir şekilde ifade etmelerini ve tekrardan kaçınmalarını sağladığını savunmuştur.

Bu çalışmada da sözcük çeşitliliğinin birinci sınıf öğrencilerinin yazma puanlarıyla dördüncü sınıf öğrencilerine kıyasla daha güçlü bir ilişki içinde olduğu bulunmuştur. Bu durum, sözcük çeşitliliğinin erken dönem L2 yazarları için daha önemli bir faktör olabileceğini düşündürmektedir, çünkü bu yazarlar hala sözcük dağarcıklarını geliştirmekte ve yazarken nasıl etkili bir şekilde kullanacaklarını öğrenmektedirler.

Çalışmanın bulgularının İngilizce Öğretmenliği uygulamaları için çeşitli çıkarımları vardır. İlk olarak, öğretmenlerin öğrencilerin çeşitli bir kelime dağarcığı geliştirmelerine yardımcı olmaya odaklanmaları gerektiğini öne sürmektedirler. Bu, okuduğunu anlama alıştırmaları, kelime oyunları ve yazma atölyeleri gibi çeşitli etkinlikler yoluyla yapılabilir. İkinci olarak, bulgular öğretmenlerin öğrencilere yazılarındaki sözcük çeşitliliği konusunda geri bildirim vermeleri gerektiğini göstermektedir. Bu geri bildirim, öğrencilerin geliştirmeleri gereken alanları belirlemelerine ve kullandıkları kelimeler konusunda daha bilinçli seçimler yapmalarına yardımcı olabilir.

Bu çalışmanın bir sınırlılığı, tek bir yazı türüne (yani tartışmacı denemelere) odaklanmış olmasıdır. Gelecekteki araştırmalar, anlatı ve betimleyici yazılar gibi diğer türlerde de sözcüksel özellikler ile yazma puanları arasındaki ilişkiyi inceleyebilir. Ayrıca, gelecekteki araştırmalar dilbilgisi, sözdizimi ve retorik farkındalık gibi yazma puanlarını etkileyebilecek diğer faktörlerin rolünü de araştırabilir.

Özetle bu çalışma ikinci dil/yabancı dil öğrencilerinde sözcüksel özellikler ve yazma yeterliliği arasındaki ilişkiye dair değerli bilgiler sunmaktadır. Bulgular, sözcüksel çeşitliliğin özellikle erken dönem L2 yazarları arasında yazma başarısı için önemli bir faktör olduğunu göstermektedir. Öğretmenler, öğrencilerin farklı bir kelime dağarcığı geliştirmelerine yardımcı olmaya odaklanmalı ve onlara yazılarındaki kelime çeşitliliği hakkında geri bildirim sağlamalıdır.