

# The Impacts of Morphological Knowledge on the Degree of Lexical Complexity and the Quality of Academic Essays of EFL Intermediate Students

Thi Hoai Thanh and Phuong Hoang Yen

## ABSTRACT

In the context of learning English in secondary schools and high schools in Vietnam in general and in Mekong Delta in particular, writing is usually considered the most challenging skill for the majority of students. These students frequently encounter a lot of obstacles in their writing practices, such as high-standard conventions in academic writing, complicated grammatical structures, lack of ideas, an insufficient amount of time spent on writing in class, as well as poor and noncomplex vocabulary. Such challenges do not only result in low performances and low scores but also students' fear and loss of interest in writing lessons. Several previous studies indicated that the teaching of morphology had positive impacts on expanding students' vocabulary, and indirectly improved the quality of their writing. This current study was conducted in order to examine the impacts of teaching morphology to EFL intermediate students on the degree of lexical complexity and the quality of their academic essays. This study employed the experimental research approach, which utilized three different research instruments: writing tests (before and after the study), questionnaires (before and after the study), and focus group interviews (after the study). This 14-week study was carried out at a private English center in Mekong Delta, with the participation of two groups of EFL students who were studying at the same level and progress. The results revealed that the instruction of morphology to EFL intermediate students had positive impacts on the degree of lexical complexity and the quality of their academic essays. Moreover, the results of the questionnaires and interviews also pointed out that these students had positive attitudes towards the instruction of morphology in their academic essay writing lessons. Finally, several recommendations and pedagogical implications were concluded with the attempt of contributing to the innovation of teaching vocabulary and teaching writing in the context of secondary schools and high schools in Mekong Delta particularly and Vietnam generally.

**Keywords:** Lexical complexity, morphology, quality of academic essays, students' attitudes.

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## I. INTRODUCTION

Writing, which is usually regarded as one of the challenging skills, plays a crucial role in students' academic life because, through writing, their ideas and opinions can be profoundly expressed. Writing is a difficult social activity and an essential skill for language learners (Pham & Truong, 2021). Despite its significance, writing seems to be neglected at secondary schools and high schools in the Mekong Delta of Vietnam due to several complicated reasons.

Academic writing refers to the type of writing which has a formal tone and style and needs to follow some agreed regulations. Typical types of academic writing for this intermediate level are paragraphs and essays. Basically, secondary and high school students are struggling with

academic writing because of the high requirements of the writing tasks as they are moving to more advanced courses. These types of writing are challenging to those students because writing essays requires them to follow standard conventions, such as the content, the accuracy and complexity of grammatical use, critical thinking, and the advanced level of vocabulary use. As I witnessed, these students have difficulties in meeting most of the requirements mentioned above. Among them, the most prominent challenge lies in the incapability of using new and advanced vocabulary in writing; moreover, they sometimes use inaccurate words for particular contexts.

The breadth and depth of a student's vocabulary will have a direct influence on the descriptiveness, accuracy, and quality of his or her writing (Ediger, 1999). Nevertheless, secondary and high school students seem to have an

insufficient amount of advanced vocabulary in general, and superficial knowledge of how words are formed in particular. Morphological knowledge refers to the metalinguistic ability to reflect on and manipulate morphemes - in other words, the ability to analyze words into smaller meaningful parts such as prefixes, roots, and suffixes (Carlisle, 2000). Masrai (2016) comments that understanding how words are formed is potentially a key component in developing a sizable second language (L2) lexicon. In addition, as vocabulary increases, L2 learners should gain more perspectives into morphological knowledge of the target language.

After investigating this field, I have discovered that morphological knowledge has been studied extensively in the literature on L2 acquisition, and mastery of morphological structure has long been proposed to be linked to vocabulary acquisition. However, as far as I know, there is relatively little research that has attempted to explore the link between morphological knowledge and the degree of lexical complexity in academic essays of EFL intermediate students in the Mekong Delta context.

Lexical complexity involves the size, variety, and quality of a learner's vocabulary and may directly affect a learner's writing quality (Kim *et al.*, 2018). The researchers measure lexical complexity through lexical density, lexical variation, and lexical sophistication. Lexical density is a measure of the proportion of lexical words to the total number of words in a text. Lexical variation is a measure of the number of different words in a writing work. Lexical sophistication is defined as the proportion of low-frequency words in a text rather than just general and everyday words (Laufer & Nation, 1995). Thus, lexical complexity is proven to directly affect the quality of writing, especially academic essays.

This research is conducted to investigate the impacts of teaching morphological knowledge to EFL intermediate students on the degree of lexical complexity and the quality of their academic essays in the context of a private English center in Mekong Delta. The current study aims to answer the following question: What are the effects of teaching morphological knowledge to EFL intermediate students on the degree of lexical complexity and the quality of their academic essays?

## II. LITERATURE REVIEW

### A. Morphological Knowledge

Morphology refers to the study of words, their internal structures, and the mental processes that are involved in word formation (Aronoff & Fudeman, 2011). In other words, it is the study of the relational and hierarchical aspects of words and the operation of lexical items according to word formation rules to produce other lexical items (Leong & Parkinson, 1995, p.237). Nagy *et al.* (2014) define morphology as the study of word formation processes, including inflectional morphemes, derivational morphemes, and compounds.

Inflectional morphemes change the grammatical features of a word but do not create a new word (e.g., third-person singular -s). Derivational morphemes derive or create a new word by adding prefixes or suffixes to a root. Arnbak and

Elbro (2000) define prefixes as morphemes that change the meaning of a root but not its grammatical class, whereas suffixes are morphemes that change both the grammatical class and the meaning of a root. Prefixes have particular meanings and consistently make a great change to the meaning of a word (e.g., *honest*, *dishonest*). Suffixes tend to provide a grammatical distinction such as indicating a shift from adjective to verb (e.g., *industrial*, *industrialize*). Therefore, when ESL/EFL learners are instructed to have a grasp of derivational morphemes, they can promote their lexical knowledge and improve their vocabulary.

Morphological knowledge is the capability to reflect on and manipulate morphemes; in other words, the ability to analyze words into smaller meaningful parts such as prefixes, roots, and suffixes (Nagy *et al.*, 2014). Kuo and Anderson (2006) suggest that morphological knowledge resembles language learners' knowledge of the process of word formation in a particular language.

Morphological awareness is regarded as a metalinguistic tool for language learners to use words efficiently and flexibly (Scott & Nagy, 2004). The use of morphological awareness is possibly a vocabulary learning strategy applied by EFL/ESL learners as it develops their lexical knowledge (Wysocki & Jenkins, 1987). Lexical knowledge can be greatly developed when they become familiar with word formation to implement morphological processing, which is adding affixes (prefixes and suffixes) to base words and synthesizing the words belonging to the same word family (e.g., *nation*, *national*, *nationalize*, *nationality*, *nationally*).

Previous research has proved that morphological knowledge is associated with significant areas of literacy acquisition, especially reading and writing. Furthermore, unlike phonological awareness, which lessens in importance after the early elementary years (Nagy *et al.*, 2006), morphological knowledge continues to grow across the upper elementary years (Berninger *et al.*, 2010) and beyond (Nagy & Scott, 2000; Tyler & Nagy, 1989). Morphological knowledge is potentially an area where more instruction should be taken to help students with the ability to infer the meaning of unfamiliar words, use accurate word forms, use morphologically complex words, and increase the quality of their lexicon.

In this study, morphological knowledge is viewed as the ability to reflect on and manipulate morphemes by analyzing and using prefixes and suffixes, as well as the knowledge and awareness of word formation and word families.

### B. The Contributions of Morphological Knowledge to the Growth of Vocabulary Knowledge in L2 Contexts

It can be said that the most outstanding contribution of morphological knowledge to literacy is in the growth of vocabulary over time. Thanks to the knowledge of morphology, EFL learners can comprehend or create new words based on the words that they already know. It is reasonable to hypothesize that knowing the words with morphemes and knowing the meaning of prefixes and suffixes can help EFL learners develop their vocabulary.

The relationship between morphological knowledge and vocabulary enhancement is seemingly reciprocal (Nagy *et al.*, 2003). When the learner has more insights into the word formation processes of English, he or she may easily acquire

new morphologically complex vocabulary. Conversely, when he or she knows more morphologically complex words, they can recognize the patterns that the words represent with ease (Muse, 2005). It is therefore suggested that morphological knowledge and students' writing performances are interrelated.

### C. The Instruction of Morphological Knowledge

Goodwin and Ahn (2013) mention that the reasoning for morphological instruction is to provide students with the knowledge of word parts (morphemes) to "support literacy tasks", basically vocabulary, reading comprehension, spelling, and writing proficiency. They point out the most common forms of morphological awareness instruction as "identifying morphemes within words, building words from morphemes, learning roots and affix meanings, highlighting morpheme patterns or rules, and forming new words using affixes".

In the current study, the instruction of morphological knowledge and awareness surrounds the teaching of prefixes, suffixes, parts of speech, and word families. The following activities are employed to explicitly teach morphology:

- 1) Dividing complex words such as "educational" and "unthinkable" into morphemes and then finding more words that share the same patterns,
- 2) Learning about suffixes (noun suffixes, verb suffixes, adjective suffixes, and adverb suffixes) and recognizing the part of speech of a certain word by looking at the suffix,
- 3) Learning about important prefixes, especially negative prefixes, and how to minimize the use of "not" by adding correct negative prefixes into the words,
- 4) Analyzing the words into prefixes, roots, and suffixes in order to guess the meaning of unfamiliar words, and create new words,
- 5) Filling the blank in a sentence using the correct form (part of speech) of the given word,
- 6) Identifying the mistakes regarding parts of speech of the words used in their own writing and fixing the mistakes,
- 7) Learning about the word family (words that come from the same family) of a certain word in the course,
- 8) Avoiding repeating words by maximizing the use of prefixes, suffixes, and flexibly using different words in the word family,
- 9) Practicing writing pairs of sentences that share the same meaning, using different words in the word family (e.g., write a pair of sentences using "inspire" and "inspiration"),
- 10) Transforming a sentence into other sentences using different parts of speech of a highlighted word (e.g., the process of *nominalization*).

### D. Lexical Complexity

According to Laufer and Nation (1995), one of the determining factors of the vocabulary used in written composition is the vocabulary size of the writer, especially if the writer is an ESL learner with a relatively small vocabulary compared with native speakers. Measures of lexical richness, or lexical complexity, attempt to compute

the degree to which a writer is using a varied and large vocabulary.

Lexical complexity involves the size, variety, and quality of a learner's vocabulary and may directly affect a learner's writing quality (Kim *et al.*, 2018). Bulté and Housen (2012) define lexical complexity as "the degree of elaboration, the size, breadth, width, or richness of the learner's L2 system or 'repertoire', that is, to the number, range, variety or diversity of different structures and items that he knows or uses". In terms of measuring lexical complexity, the measures of Laufer and Nation (1995) are implemented. These measures consist of lexical density, lexical diversity, and lexical sophistication.

According to Johansson (2008), lexical density illustrates the proportion of lexical items in a text. In other words, lexical density is defined as the percentage of lexical words, i.e., nouns, verbs, adjectives, and adverbs, in the text. A high ratio indicates a lexically dense text. The higher the ratio, the more lexical words are contained in the text. It can be understood that a text with a high proportion of content words contains more information than a text with a high proportion of function words. When EFL learners have knowledge of morphology, they may use a variety of parts of speech in their academic writing, such as nouns, verbs, adjectives, and adverbs, rather than being inclined to use a certain part of speech. Therefore, it is hypothesized that morphological knowledge may help increase the number of lexical words in writing and help the writing convey more information and meaning. According to Laufer and Nation (1995), lexical density (LD) is measured as follows:

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

Lexical diversity is a measure of the number of different words in a writer's lexical repertoire and informs the understanding of systemic complexity (Laufer & Nation, 1995). In other words, it is the type/token ratio. Read (2000) uses the term *lexical variation* to refer to this concept. According to Bulté *et al.* (2008), lexical diversity refers to the extent of the learner's lexical knowledge or the number of different words he or she knows and uses. For the text to be highly diverse, the speaker or writer must use a wide range of different words with little repetition of the words already used. How well a learner can express himself with a variety of vocabulary he or she knows or what types of words he or she knows are typically shown through the degree of lexical variation. It is hypothesized that learners who know how to use suffixes, prefixes, parts of speech, and word families may increase the number of different words, avoid repeating words, and use accurate vocabulary in their writings. According to Laufer and Nation (1995), lexical variation (LV) is measured as follows:

$$LV = \frac{(\text{Number of types} \times 100)}{\text{Number of tokens}}$$

Lexical sophistication, also labeled as lexical rareness, is defined as the proportion of low-frequency words, or advanced words, in a text "rather than just general, everyday vocabulary" (Read, 2000). In order to determine what



vocabulary is advanced, it is necessary to take the learner's level into consideration. In this study, the researcher employed the BNC/COCA lists, which were developed by Paul Nation. It is hypothesized that students having good morphological knowledge may know less frequent words through the transformation of words using prefixes and suffixes and through the use of different words in the word families. According to Laufer and Nation (1995), lexical sophistication (LS) is measured as follows:

$$LS = \frac{(\text{Number of advanced tokens} \times 100)}{\text{Total number of lexical tokens}}$$

#### E. The Measurement of Lexical Complexity

In order to measure the degree of lexical complexity in the pretest and posttest of the two groups, the web-based Lextutor developed by Paul Nation and his colleagues was employed. This platform offers a wide range of linguistic measures. The VocabProfiler (n.d.) section takes an English text as input and computes several indices of lexical complexity of the text, such as number of tokens, number of types, number of families, number of lexical words, the type/token ratio, family/token ratio, lexical density, and number of types which are specifically divided into 25 lists of frequency (BNC/COCA 25k).

To measure the degree of lexical sophistication, the number of "advanced" words is divided by the number of lexical words. In this study, "advanced" words are the words that go from 1001 (K2) to 25000 (K25) in the BNC/COCA lists. The BNC/COCA lists developed by Paul Nation were utilized in this study because they serve as a reliable and convenient measure of lexical complexity, especially lexical sophistication. The words in an essay are classified into 25 lists so that the researcher can identify and count the number of "advanced" words.

#### F. The Impact of Lexical Complexity on the Quality of Academic Essays

Lexical complexity is one of the most significant features in academic written texts of advanced writers. Highly proficient writers make use of more sophisticated vocabulary (Laufer & Nation, 1995). The use of lexical complexity describes the writer's ability to communicate efficiently in written form (Lu, 2012). Thus, the existence of lexical complexity in students' academic texts sets forth the students' writing proficiency.

The existence of lexical complexity in academic essays is also the nature of the essay itself that loads complex ideas, that need lexical complexity to generate them meaningfully. The complicated ideas can be more meaningfully and flexibly explained through the wide range of vocabulary and can be precisely and sophisticatedly generated using particular and accurate words. Moreover, complex ideas are commonly written in complex lexis to accommodate the needs for describing and explaining specifications. Pertaining to the nature of academic essays, a writer generally needs to employ a high degree of lexical complexity in their academic essays. In short, academic essays use a wide variety of vocabulary, employ the use of

unusual or advanced words, and label a wide range of vocabulary.

Lexical complexity has been recognized as an indicator, diagnostic, and a major parameter for L2 learning, teaching, and research (Bulté & Housen, 2012; Laufer, 1994). Several research studies explain that lexical complexity is one of the important constructs in academic writing because it can enhance the L2 writers' writing scores. The scores are given based on the extent of word type used in the text, the intensive use of advanced or derived words (unique and longer words), and the proportion of content words exhibited in the text.

In short, the three aspects of lexical complexity (density, diversity, and sophistication) combine to paint a complete picture of the complexity of a learner's lexical knowledge, especially in academic essay writing. It is therefore that the high level of lexical complexity leads to the good quality of academic essay writing.

#### G. The Impact of Morphological Knowledge on the Level of Lexical Complexity and the Quality of Academic Essays

Recent studies suggest that learners acquiring the knowledge of morphology have a tendency to have a larger lexicon and better reading comprehension (Kieffer & Lesaux, 2008, 2012), and by extension better writing (Templeton, 2012). Additionally, Coutu-Fleury (2015) has also examined that the instruction of morphological knowledge has a great influence on the reading and spelling abilities of EFL students, which specifically helps with reading comprehension and writing proficiency (Moats *et al.*, 2010). Asaad and Shabdin (2021) proposed in their study that morphological knowledge and awareness directly contribute to academic writing and indirectly improve vocabulary knowledge. Increasing the EFL students' knowledge of morphology would help in enlarging the size and the quality of their English vocabulary used in writing in terms of using a variety of words and using more low-frequency words to improve and enhance the quality of their academic writing. As a result, morphology is potentially an effective instructional tool for EFL intermediate learners to develop and use vocabulary creatively and flexibly. The role of vocabulary in the attempts at writing mastery is undeniable because the learners can't write effectively and flexibly without an adequate amount of vocabulary.

It has been proved by many studies that a high degree of lexical complexity can lead to the complexity and good quality of academic essay writing (Higginbotham & Reid, 2019; Johansson, 2008; Kim *et al.*, 2018; Lu & Ai, 2015; Schnur & Rubio, 2021). However, there is little research aiming to investigate the link between morphological knowledge and the degree of lexical complexity. In order words, whether the instruction of morphological knowledge can result in a higher degree of lexical complexity, and then the quality of academic essay writing, remains unclear. Therefore, this experimental research attempts to figure out the impacts of morphological knowledge on the degree of lexical complexity and the quality of academic essays of EFL intermediate students.

### III. METHOD

#### A. Participants

The participants of the current experimental study were EFL intermediate students who were studying at a private English center in Can Tho city, Vietnam. The population of the two groups was relatively equal, which was 20 students for the control group and 17 students for the experimental group. They were studying English to acquire more knowledge regarding English and strengthen their English skills.

The course book they were using was Perspectives 2, which was published by National Geographic Learning. During the courses, each academic skill: listening, speaking, reading, and writing, received the same attention. In terms of writing, the students had a writing lesson every two weeks, and the courses focused on only one genre of essay: pros and cons essays.

#### B. Instruments

The writing tests were conducted in order to assess and measure the students' writing quality and the degree of lexical complexity in their writing. The pretest was implemented before the research to determine the students' initial writing performances and collect data on the degree of lexical complexity in their writing before the intervention. The posttest was fulfilled after the research to assess and measure the improvement of the students' writing quality and the degree of lexical complexity after the intervention.

Both the pretest and posttest required all of the students to write an academic essay whose length was about 200 words based on a given topic. More specifically, the pretest was delivered in the first week of the study, which required the students to write a pros and cons essay answering the question "Should PE be a mandatory subject at school, with the same importance as other subjects such as Maths and English?". After the 14-week period, they took the posttest, which required them to write a pros and cons essay answering the question, "Should art and music be eliminated from the school curricula?".

The students' essays were imported to the web-based Lextutor analyzer. When the results were presented, the researcher selectively chose four indices of lexical complexity involving the type-token ratio, the lexical density, the number of advanced words (from k2 to k25), and the number of lexical words, to take note of.

#### C. Intervention

The experimental group received the treatment during the 14 weeks. The knowledge of morphology, which mainly focused on prefixes, suffixes, parts of speech, and word families, was combined into reading and writing lessons every week. There were no official and formal lessons that intensively taught the students about the knowledge of morphology, but the knowledge was supplemented throughout the course. In other words, when the students learned a new word, the researcher introduced its parts of speech, its word families, and any possible prefixes and suffixes attached to the word, to the students. Then, the students were instructed on how to write the sentences using correct word forms, how to flexibly use different words from the word family to write different sentences, and how

to form new words using prefixes and suffixes. Moreover, they were also instructed on how to transform common structures into more academic ones.

For the control group, the students were not exposed to the knowledge of morphology throughout the courses. In terms of teaching vocabulary, the students learned about spelling and meaning. Regarding writing, the students in this group were only taught about the content and organization of the essays. There was little, if any, access to the knowledge of affixes, parts of speech, or word families during the research period.

TABLE I: THE INTERVENTION

Domain	Example
Teaching prefixes and suffixes	– Teach important prefixes: negative prefixes (e.g., <i>dis-</i> , <i>un-</i> , <i>il-</i> , <i>im-</i> , <i>ir-</i> , <i>in-</i> ), <i>super-</i> , <i>over-</i> , <i>extra-</i> , <i>multi-</i> , <i>inter-</i> , <i>uni-</i> , <i>com-</i> , and so on,
	– Teach important suffixes: noun suffixes ( <i>-tion</i> , <i>-sion</i> , <i>-ment</i> , <i>-ness</i> , <i>-ty</i> , <i>-ance</i> , <i>-ence</i> , <i>-ism</i> , <i>-th</i> ), verb suffixes ( <i>-ize</i> , <i>-ate</i> , <i>-fy</i> , <i>-en</i> ), adjective suffixes ( <i>-al</i> , <i>-ous</i> , <i>-y</i> , <i>-ive</i> , <i>-ic</i> , <i>-ical</i> , <i>-ful</i> , <i>-less</i> ), adverb suffix ( <i>-ly</i> ),
	– Teach how to minimize the use of "not" by using negative prefixes.
	– Teach how to identify the parts of speech of the words in the sentences by looking at the suffixes.
Teaching parts of speech	– Teach how to guess the meaning of unfamiliar words by analyzing the prefixes and use the prefixes to form new words.
	– Teach how to recognize the part of speech of a word, and which part of speech is needed in a specific position of the sentence,
	– Teach how to use the right part of speech in writing and recognize the mistakes regarding parts of speech in the writing,
Teaching word families	– Teach how to increase the lexical words, nouns, verbs, adjectives, and adverbs in a sentence.
	– Teach word families of the important words in the course, and how to change from a part of speech into another part of speech (e.g., change a noun into a verb and vice versa),
	– Teach how to use different words within a word family in writing to write different sentences,
	– Teach how to avoid repeating words and grammatical structures by using different words in the word family.

### IV. RESULTS

#### A. The Degree of Lexical Complexity in the Pretest and Posttest between the Two Groups

The results from the *Descriptive Statistics Tests* are illustrated in Table II below.

TABLE II: THE DEGREE OF LEXICAL COMPLEXITY IN THE PRETEST AND POSTTEST BETWEEN THE TWO GROUPS

Writing Test	Group	N	Min	Max	M	SD
Pretest	Control	20	0.35	0.51	0.41	0.04
	Experimental	17	0.35	0.51	0.43	0.05
Posttest	Control	20	0.38	0.43	0.41	0.02
	Experimental	17	0.39	0.49	0.45	0.03

An *Independent Sample T-test* was then conducted to examine whether there was a significant difference

regarding the degree of lexical complexity in the pretest between the control group ( $M_C = 0.41$ ,  $SD = 0.04$ ) and the experimental group ( $M_E = 0.43$ ,  $SD = 0.05$ ) before the study. The results showed that there was no difference between the two groups ( $t = -1.03$ ,  $df = 35$ ,  $p = 0.31$ ). The two groups achieved a similar degree of lexical complexity before the treatment.

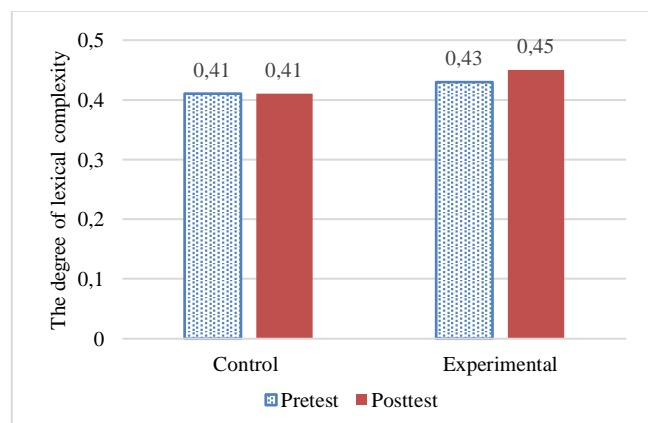


Fig. 1. The average degree of lexical complexity in the pretest and posttest between the two groups.

In order to investigate whether there was a significant disparity regarding the degree of lexical complexity between the control group ( $M_C = 0.41$ ) and the experimental group ( $M_E = 0.45$ ) after the study, an *Independent Sample T-Test* was again implemented. The results indicated that there was a significant difference between the two ( $t = -6.33$ ,  $df = 35$ ,  $p = 0.00$ ). It is therefore concluded that EFL students in the experimental group achieved a higher degree of lexical complexity than the ones in the control group after the 14-week study. A brief summary of the mean scores of the pretest and posttest of the two groups can be seen in the Fig 1.

### B. The Degree of Lexical Complexity in the Pretest and Posttest within the Two Groups

*One-Sample T-Tests* were carried out to check whether the mean scores of the degree of lexical complexity in academic essays of the two groups before the study ( $M_C = 0.41$ ,  $M_E = 0.43$ ) and after the study ( $M_C = 0.41$ ,  $M_E = 0.45$ ) were the same as the test value 0.5 (as the average score in the 1-degree scale). The results indicated that each mean score was different from the test value 0.5 ( $p = 0.00$ ). This can be concluded that the degrees of lexical complexity in academic essays of the two groups before and after the intervention were just below average.

A *GLM for Repeated Measure Test* was then carried out to investigate whether the mean score of the degree of lexical complexity in academic essays in the control group before the study ( $M = 0.41$ ) and after the study ( $M = 0.41$ ) were different. The results pointed out that there was no difference between the two mean scores ( $p = 0.553$ ,  $F = 0.365$ ). Thus, during the study, EFL students in the control group achieved no improvement regarding the degree of lexical complexity. Visualization of the mean scores of the pretest and posttest in the control group is in Fig. 2.

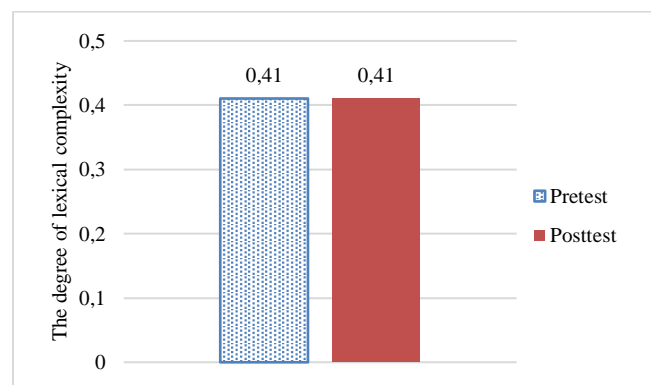


Fig. 2. The degree of lexical complexity in the pretest and posttest in the control group.

In addition, a *GLM for Repeated Measure Test* was again implemented to figure out whether the mean score of the degree of lexical complexity in academic essays in the experimental group before the study ( $M = 0.43$ ) and after the study ( $M = 0.45$ ) were significantly different. The results suggested that the two mean scores were different ( $p = 0.04$ ,  $F = 5.06$ ). It is therefore revealed EFL students in the experimental group achieved a higher degree of lexical complexity in their academic essays after the intervention. Visualization of the mean scores of the pretest and posttest in the experimental group can be seen in Fig. 3.

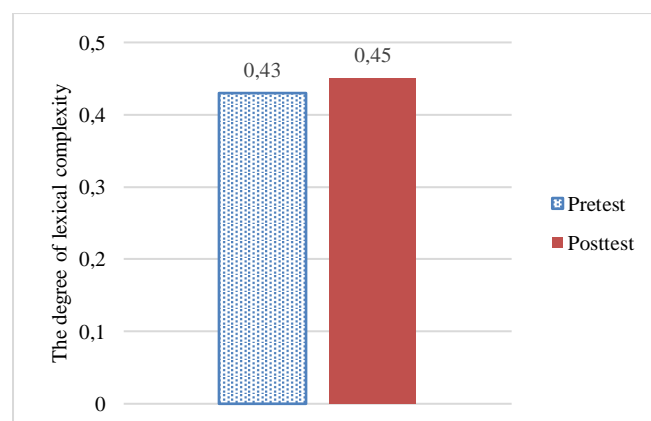


Fig 3. The average degree of lexical complexity in the pretest and posttest in the experimental group.

What is more, *Independent Sample T-Tests* were utilized to investigate whether there was a significant difference between male and female students' mean scores of the degree of lexical complexity in academic essays before and after the study in the two groups. The results indicated that there was no significant difference between the mean scores of the female and male students in the control group before and after the study ( $t = 0.814$ ,  $df = 18$ ,  $p = 0.43$ , and  $t = -0.847$ ,  $df = 18$ ,  $p = 0.41$ , respectively). It is concluded that female and male students in the control group achieved a similar degree of lexical complexity in their academic essays before and after the study. The results, however, pointed out that the mean scores of female and male students in the experimental group before the study were different ( $t = 5.06$ ,  $df = 15$ ,  $p = 0.00$ ), whereas there was no difference in the mean scores between the female and male students after the study ( $t = 1.636$ ,  $df = 15$ ,  $p = 0.123$ ). Hence, in the experimental group, female students achieved a higher degree of lexical complexity than male students did

before the intervention; however, after the intervention, they achieved a similar degree of lexical complexity. Details can be seen in Table III.

TABLE II: THE DEGREE OF LEXICAL COMPLEXITY IN THE PRETEST AND POSTTEST BETWEEN FEMALES AND MALES

Group	Gender	N	Before the study		After the study	
			M	Sig.	M	Sig.
Control	Female	12	0.42	0.43	0.4	0.41
	Male	8	0.4		0.41	
Experimental	Female	6	0.48	0.00	0.47	0.13
	Male	11	0.4		0.44	

### C. The Degree of Lexical Complexity on Specific Components within the Two Groups

First, *Descriptive Statistics Tests* were run to check the mean scores of these three components of lexical complexity in academic essays of the control and experimental groups before and after the study. The results are shown in Table IV.

TABLE IV: THE DEGREE OF THE THREE COMPONENTS OF LEXICAL COMPLEXITY

Group	Test	N	Lexical density (LD)	Lexical variation (LV)	Lexical sophistication (LS)
Control	Pretest	20	0.51	0.51	0.22
	Posttest	20	0.54	0.48	0.21
Experimental	Pretest	17	0.52	0.53	0.24
	Posttest	17	0.55	0.52	0.28

The results from the *Paired-Sample T-Tests* showed that in the control group, the degree of lexical density and the degree of lexical variation before and after the study were different from each other, whereas the degree of lexical sophistication remained similar ( $t = -3.57$ ,  $p = 0.002$ ;  $t = 2.49$ ,  $p = 0.02$ ; and  $t = 0.82$ ,  $p = 0.43$ , respectively). It is suggested that the EFL students in the control group achieved a higher degree of lexical density, but a lower degree of lexical variation, and a similar degree of lexical sophistication after the study. Visualization of these results can be seen in the Fig. 4 below.

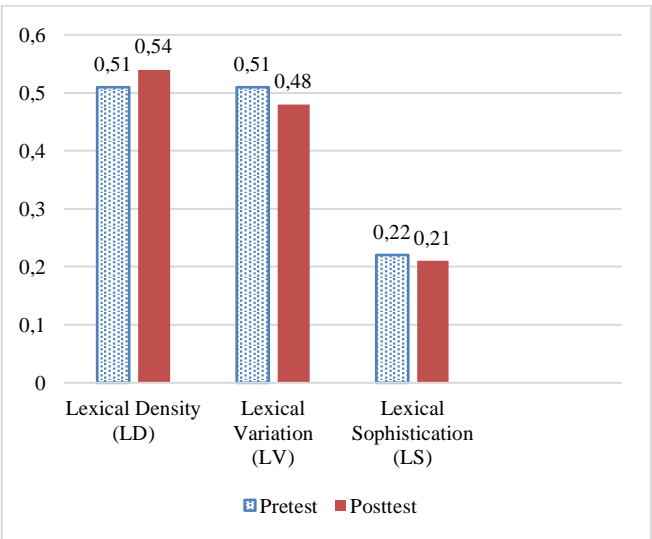


Fig. 4. The degree of the three components of lexical complexity in the pretest and posttest in the control group.

In the experimental group, the degree of lexical density and that of lexical sophistication in the pretest and posttest were different, while the degree of lexical variation remained the same ( $t = -3.1$ ,  $p = 0.007$ ;  $t = -2.14$ ,  $p = 0.048$ ; and  $t = 0.3$ ,  $p = 0.77$ , respectively). After the study, EFL students in the experimental group gained a higher degree of lexical density, a higher degree of lexical sophistication, and a similar degree of lexical variation. Visualization of these results can be seen in Fig. 5 below.

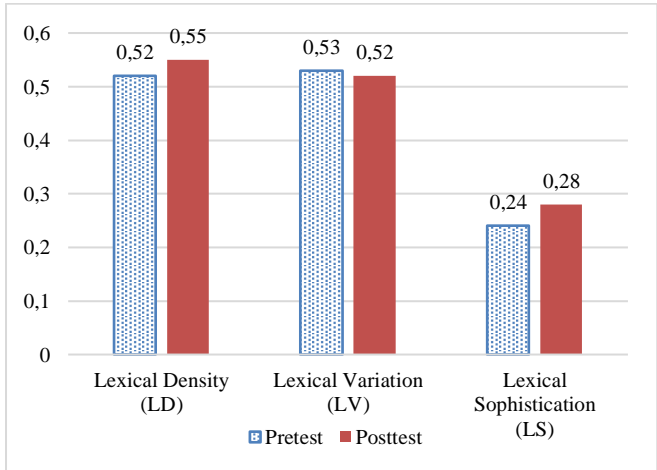


Fig. 5. The degree of the three components of lexical complexity in the pretest and posttest in the experimental group.

### A. The Degree of Lexical Complexity on Specific Components between the Two Groups

Then, *Independent-Sample T-Tests* were conducted to compare the degrees of the three components of lexical complexity in academic essays between the control group and the experimental group. The results pointed out that, before the study, there was no difference between the two groups, regarding the degree of lexical density, lexical variation, and lexical sophistication ( $t = -0.92$ ,  $df = 35$ ,  $p = 0.36$ ;  $t = -0.84$ ,  $df = 35$ ,  $p = 0.41$ ; and  $t = -1.03$ ,  $df = 35$ ,  $p = 0.31$ , respectively). In other words, the degree of the three components of lexical complexity in academic essays between the two groups was similar before the study. Visualization of these results can be seen in the Fig. 6 below.

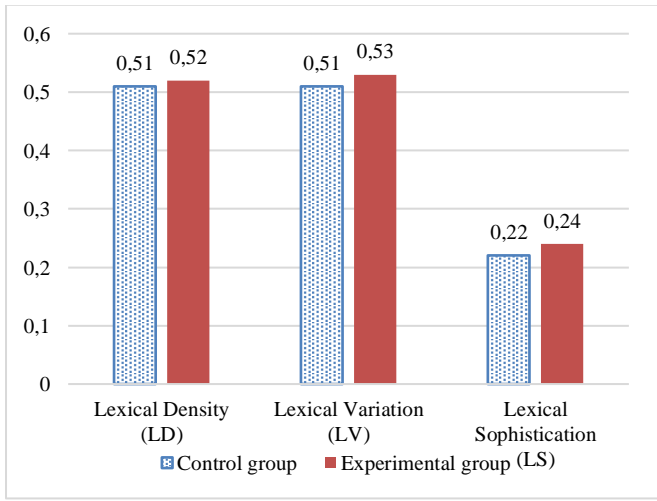


Fig. 6. The degrees of the three components of lexical complexity in the pretest between the two groups.



After the study, there were significant differences in the degree of lexical variation and the degree of lexical sophistication between the two groups ( $t = -4.92$ ,  $df = 35$ ,  $p = 0.00$ ; and  $t = -5.38$ ,  $df = 35$ ,  $p = 0.00$ , respectively), while no difference in the degree of lexical density between the two groups ( $t = -1.29$ ,  $df = 35$ ,  $p = 0.21$ ) could be found. What can be inferred from the results was that EFL students in the experimental group achieved higher degrees of lexical variation and lexical sophistication than the students in the control group, whereas the degrees of lexical density achieved by the students of the two groups were similar after the study period. Visualization of these results can be seen in Fig. 7 below.

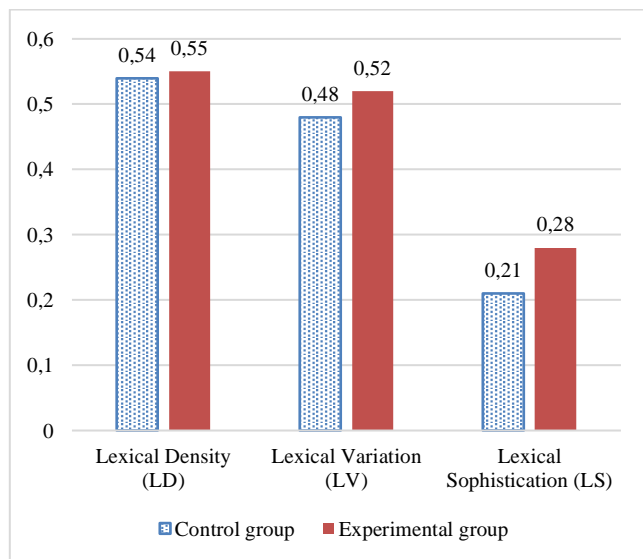


Fig. 7. The degrees of the three components of lexical complexity in the posttest between the two groups.

The results above suggested that through the instruction of morphological knowledge and awareness, EFL students in the experimental group achieved higher degrees of lexical variation and lexical sophistication in comparison with the students in the control group. Also, the degrees of lexical density in academic essays between the two groups were not statistically different after the study.

Taking all the results illustrated above into consideration, morphological knowledge proved to have positive impacts on the degree of lexical complexity in EFL students' academic essays, especially the degree of lexical variation and lexical sophistication. EFL students increased the degree of lexical complexity in their academic essays and then improved the quality of their academic essays.

## V. DISCUSSION

The current study was performed in an attempt to examine whether the knowledge of morphology helps increase the degree of lexical complexity and then improve the quality of academic essays of EFL intermediate students. Through the implementation of the tests, some main findings were discovered as follows.

First, before the study, the degree of lexical complexity academic essays of the students in the control group ( $M_C = 0.41$ ) and that of the students in the experimental group ( $M_E = 0.43$ ) were similar, which means that the students of the

two groups performed similarly in their academic essays, regarding the degree of lexical complexity. However, after the 14-week intervention, the students in the experimental group achieved a higher degree of lexical complexity ( $M_E = 0.45$ ) than the ones in the control group ( $M_C = 0.41$ ).

Second, as far as the improvement of the degree of lexical complexity in academic essays within the two groups after the study is concerned, it was concluded that only the students in the experimental group made considerable progress after the study period ( $M_{pre} = 0.43$ ,  $M_{post} = 0.45$ ,  $p = 0.04$ ), whereas no improvement could be found in the control group ( $M_{pre} = 0.41$ ,  $M_{post} = 0.41$ ,  $p = 0.553$ ). Therefore, the knowledge of morphology proved to have a positive impact on the degree of lexical complexity in academic essays of EFL intermediate students.

Third, female and male students of the two groups had similar achievements in terms of the degree of lexical complexity in their academic essays before and after the study, except for the case in the experimental group before the intervention. More specifically, the female students achieved a higher degree of lexical complexity in their academic essays than male students ( $M_f = 0.48$ ,  $M_m = 0.4$ , respectively).

Fourth, the degree of the three components of lexical complexity, namely lexical density, lexical variation, and lexical sophistication, varied quite a lot within the two groups before and after the study. In detail, the students in the control group achieved a higher degree in lexical density, but a lower degree in lexical variation, and a similar degree in lexical sophistication, whereas the ones in the experimental group achieved higher degrees in both lexical density and lexical sophistication, and a similar degree in lexical variation.

Fifth, the degree of the three components of lexical complexity in academic essays of the two groups were the same before the study; however, after the 14-week intervention, the students in the experimental group achieved higher degrees in lexical variation and lexical sophistication in comparison with the ones in the control group, whereas no differences in the degree of lexical density could be found between the two groups. Hence, morphological knowledge proved to have positive impacts on the degree of lexical complexity in academic essays of EFL intermediate students, especially the degree of lexical variation and lexical sophistication.

Considering the results of the writing tests, it is agreed that the knowledge of morphology could help EFL intermediate students increase the degree of lexical complexity in their academic essays, enhance the quality of the vocabulary, and then improve the quality of their academic essays. The findings of the current research are consistent with the hypothesis, literature, and some of the results of the previous studies.

Regarding EFL students' academic essay writing performance before and after the instruction of morphological knowledge taking place, the findings indicated that the knowledge and awareness of morphology could help EFL students intensify the degree of lexical complexity and then improve the quality of the vocabulary used in their academic essays. These findings are in line with the results of a great number of previous studies (Asaad



& Shabdin, 2019; Goodwin & Ahn, 2013; Kieffer & Lesaux, 2008, 2012; Kuo & Anderson, 2006; Muse, 2005; Nagy *et al.*, 2003, 2014; Nagy & Scott, 1990; Scott & Nagy, 2004; Wysocki & Jerkins, 1987). The authors pointed out that morphological knowledge and awareness serve as a metalinguistic tool for learners to use words effectively and flexibly and can be applied by EFL learners to enhance their lexical knowledge. Moreover, the knowledge of morphology helps students use accurate word forms, perceive better spelling, use a variety of words, create more morphologically complex words, use more low-frequency words, have a larger vocabulary, and increase the quality of their lexicon. What is more, they stated that EFL learners can have the ability to create new words based on the words that they already know, thanks to frequent exposure to morphological knowledge. Students' knowledge of morphology appears to develop strongly when they are at the intermediate level, and this corresponds with the study of Nagy and Scott (1990). Last but not least, according to the previous research, what makes morphological knowledge stand out as an area that needs more instruction is its contribution to the intensification of lexical density and lexical sophistication. This is in accordance with the findings of the writing tests in this study, as EFL students in the experimental group achieved higher degrees in lexical density and lexical sophistication, and a similar degree of lexical variation in their posttests in comparison with the pretests. The results of the present study agree with the study conducted by Kieffer and Lesaux (2012), which concluded that morphological awareness made a substantial contribution to the vocabulary improvement of L2 learners.

In the current research, the instruction of morphological knowledge had a direct impact on the degree of lexical complexity and the quality of the vocabulary, and an indirect influence on the quality of EFL students' academic essays. This is in agreement with the findings of several previous studies (Bulté & Housen, 2014; Laufer, 1994; Lu, 2012; Moats *et al.*, 2010; Templeton, 2012). It was concluded in their studies that complex ideas can be more flexible and meaningfully explained through a wide range of vocabulary use, and can be specifically and sophisticatedly generated through the use of specific words. It is therefore that an efficient writer needs to employ a high degree of lexical complexity in their academic essays. Furthermore, lexical complexity has also been acknowledged as an indicator, diagnostic, and a major parameter for L2 learning and teaching, especially in academic essays. Some research also suggested that lexical complexity is one of the significant constructs in academic writing because it can enhance writers' writing scores. The scores are basically given on the extent of word type used in the text, the intensive use of advanced or derived words, and the proportion of contented words exhibited in the text. This is in line with the current study, as the more lexical complexity the student achieved, the higher the score he or she got. Such studies also pointed out that increasing EFL students' knowledge of morphology would help in upgrading the vocabulary used in their academic essays and then improving the quality of their essays because the role of vocabulary in the attempts of writing mastery is undeniable.

In a nutshell, the current study, together with the previous ones, proved that a high level of lexical complexity could result in good-quality academic essay writing. The results of the current study are in consonance with the study of Northey *et al.* (2015) which found that morphological skills play a significant role in writing at the word, sentence, and text level, and with the study of Sarfraz *et al.* (2018) which discovered that morphological awareness was effective and improved students' writings.

## VI. CONCLUSION

The current study was implemented in order to investigate whether morphological knowledge helped increase the degree of lexical complexity and then improve the quality of academic essays of EFL intermediate students. The findings from the writing tests (pretest and posttest) indicated that the students in the experimental group achieved a higher degree of lexical complexity in their academic essays, whereas no improvement regarding the degree of lexical complexity could be found in the control group. In terms of enhancement of the three components of lexical complexity, the students in the experimental group achieved higher degrees of lexical density and lexical sophistication, and a similar degree of lexical variation after the 14-week intervention. Regarding the differences in the degree of lexical complexity between the two groups, the students in the experimental group achieved higher degrees of lexical variation and lexical sophistication in comparison with the ones in the control group, whereas the degree of lexical density remained the same between the two groups throughout the study period. The results of the tests also revealed that gender, hometowns, or schools did not contribute much to the differences in lexical complexity between the students after the study.

## APPENDIX

### A. Pretest Question

Should Physical Education be a mandatory subject at school, with the same importance as other subjects like Math and English? Write a well-developed essay to express your opinions about the statement. You are encouraged to write at least 200 words.

### B. Posttest Question

Should art and music be eliminated from the school curricula? Write a well-developed essay to express your opinions about the statement. You are encouraged to write at least 200 words.

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## CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

## REFERENCES

- Arnbak, E., & Elbro, C. (2000). The effects of morphological awareness training on the reading and spelling skills of young dyslexics. *Scandinavian Journal of Educational Research*, 44(3), 229–251.
- Aronoff, M., & Fudeman, K. (2011). *What is morphology?* (2<sup>nd</sup> ed.). Wiley.
- Asaad, H. Q. M., & Shabdin, A. A. (2021). The predictive role of morphological awareness and productive vocabulary knowledge in L2 postgraduate students' academic writing. *Eurasian Journal of Applied Linguistics*, 24–44.
- Berninger, V. W., Abbott, R. D., Nagy, W., & Carlisle, J. (2010). Growth in phonological, orthographic, and morphological awareness in grades 1 to 6. *Journal of Psycholinguistic Research*, 39(2), 141–163.
- Bulté, B., Housen, A., Pierrard, M., & van Daele, S. (2008). Investigating lexical proficiency development over time – the case of Dutch-speaking learners of French in Brussels. *Journal of French Language Studies*, 18(3), 277–298.
- Carlisle, J. F. (2000). awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing*, 12(3), 169–190.
- Carlisle, J. F. (2000). awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing*, 12(3), 169–190.
- Coutu-Fleury, C. (2015). The effects of morphological awareness training on the reading and spelling performance of young dyslexics. *Langues et Linguistique*, 35, 72–79.
- Ediger, M. (1999). Reading and vocabulary development. *Instructional Psychology*, 26.
- Goodwin, A. P., & Ahn, S. (2013). A meta-analysis of morphological interventions in English: Effects on literacy outcomes for school-age children. *Scientific Studies of Reading*, 17(4), 257–285.
- Higginbotham, G., & Reid, J. (2019). The lexical sophistication of second language learners' academic essays. *Journal of English for Academic Purposes*, 37, 127–140.
- Johansson, V. (2008). Lexical diversity and lexical density in speech and writing: A developmental perspective. *Working Papers in Linguistics*, 53, 61–79.
- Kieffer, M. J., & Lesaux, N. K. (2008). The role of derivational morphology in the reading comprehension of Spanish-speaking English language learners. *Reading and Writing*, 21(8), 783–804.
- Kieffer, M. J., & Lesaux, N. K. (2012). Direct and indirect roles of morphological awareness in the English reading comprehension of native English, Spanish, Filipino, and Vietnamese speakers. *Language Learning*, 62(4), 1170–1204.
- Kim, M., Crossley, S. A., & Kyle, K. (2018). Lexical sophistication as a multidimensional phenomenon: Relations to second language lexical proficiency, development, and writing quality. *The Modern Language Journal*, 102(1), 120–141.
- Kuo, L. J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational psychologist*, 41(3), 161–180.
- Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied Linguistics*, 16(3), 307–322.
- Leong, C. K., & Parkinson, M. E. (1995). Processing of English morphological structure by poor readers. In C. K. Leong, & R. M. Joshi (Eds.), *Developmental and acquired dyslexia* (pp. 237–261). Kluwer Academic Publishers.
- Lu, X., & Ai, H. (2015). Syntactic complexity in college-level English writing: Differences among writers with diverse L1 backgrounds. *Journal of Second Language Writing*, 29, 16–27.
- Muse, A. E. (2005). *The nature of morphological knowledge*. Retrieved from [http://purl.flvc.org/fsu/fd/FSU\\_migr\\_etd-2161](http://purl.flvc.org/fsu/fd/FSU_migr_etd-2161).
- Nagy, W. E., & Scott, J. A. (1990). Word schemas: Expectations about the form and meaning of new words. *Cognition and Instruction*, 7(2), 105–127.
- Nagy, W., & Scott, J. A. (2000). Vocabulary processes. In M. L. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (pp. 269–284). Lawrence Erlbaum.
- Nagy, W., Berninger, V., Abbott, R., Vaughan, K., & Vermeulen, K. (2003). Relationship of morphology and other language skills to literacy skills in at-risk second-grade readers and at-risk fourth-grade writers. *Educational Psychology*, 95(4), 730–742.
- Nagy, W., Berninger, V. W., & Abbott, R. D. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Educational Psychology*, 98(1), 134–147.
- Nagy, W. E., Carlisle, J. F., & Goodwin, A. P. (2014). Morphological knowledge and literacy acquisition. *Learning Disabilities*, 47(1), 3–12.
- Northey, M., & Mccutchen, D. & Sanders, E. A. (2015). Contributions of morphological skill to children's essay writing. *Reading and Writing: An Interdisciplinary Journal*, 29(1), 47–68.
- Oz, H. (2014). Morphological awareness and some implications for English language teaching. *Procedia - Social and Behavioral Sciences*, 136, 98–103.
- Pham, V. P. H., & Truong, M. H. (2021). Teaching writing in Vietnam's secondary and high schools. *Education Sciences*, 11(10), 632.
- Read, J. (2000). *Assessing vocabulary*. Cambridge University Press.
- Sarfras, S., Tariq, U. & Abbas, A. (2018). Effectiveness of morphological awareness in English writing composition of Pakistani students at the undergraduate level-case study. *Journal of Education and Practices*, 9(19), 78–84.
- Scott, J. & Nagy, W. (2004). Developing word consciousness. In J. Baumann & E. Kame'enui (Eds.), *Vocabulary instruction, research to practice* (pp. 201–215). Guilford Press.
- Schnur, E., & Rubio, F. (2021). Lexical complexity, writing proficiency, and task effects in Spanish dual language immersion. *Language Learning & Technology*, 25(1), 53–72.
- Templeton, S. (2012). Teaching and learning morphology: A reflection on generative vocabulary instruction. *Journal of Education*, 192(2–3), 101–107.
- Tyler, A., & Nagy, W. (1989). The acquisition of English derivational morphology. *Journal of Memory and Language*, 28(6), 649–667.
- Wysocki, K., & Jenkins, J. R. (1987). Deriving word meanings through morphological generalization. *Reading Research Quarterly*, 22(1), 66–81.
- VocabProfiler*. (n.d.). Lextutor. Retrieved June, 2023, from <https://www.lextutor.ca/vp/comp/>.