



# The Relationship Between the Frequency and the Range of Morphemes Used in Students' Essays and Essay Scores in an American School in Dubai

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**Abstract. Purpose** - The purpose of this research paper was to determine whether there is a relationship between the frequency and the range of morphemes used in students' essays and their actual essay scores.

**Methodology** - To address the research questions, the mixed methods design was conducted to view the findings from different angles.

**Findings** - The results suggest that there is a strong relationship between the range of morphemes used in students' essays and essay scores.

**Implications** - These findings can have meaningful implications for English teachers and linguists in the UAE, specifically, about the significance of considering the morphology used in students' essays.

**Originality** - This paper adds to the growing body of literature by adding information on the frequency and the range of morphemes used in students' writing and essay scores in the UAE's education sector. This may contribute to more significant information within the field of linguistics.

**Keywords:** Morphology · Literacy · Frequency · Essay Scores

## 1 Introduction

Writing is a fundamental aspect of English Language Acquisition (ELA) learning for teachers as well as students, as some experts argue it is crucial to facilitate the acquisition of the target language (Ferris 2011 in Ene & Kosobucki 2016). The fundamental building blocks of language are grammatical morphemes, which include articles, suffixes, and prefixes. These morphemes encode a variety of concepts; hence, it is crucial for ELA learners to acquire them (Murakami 2014). Therefore, to inculcate literacy skills among students, they need to receive an adequate amount of support in nurturing lexical, syntax, and discourse skills that are necessary for comprehending written text (Hemphill & Tivan 2008). However, despite its importance, acquiring grammatical morphemes seems to be remarkably challenging for second-language learners (Ellis 2008). Considering this point, it could be argued that this is one of the reasons students' essays are mainly graded by the rubric given instead of stressing the range of morphemes used in the essays.

Therefore, this research attempts to delve into the morphological analysis, specifically whether the variety of morphemes has an impact on students' essay scores. Essentially, the aim of this investigation is to determine whether there is a relationship between the frequency and the range of morphemes used in students' essays and their actual essay scores. The research questions are:

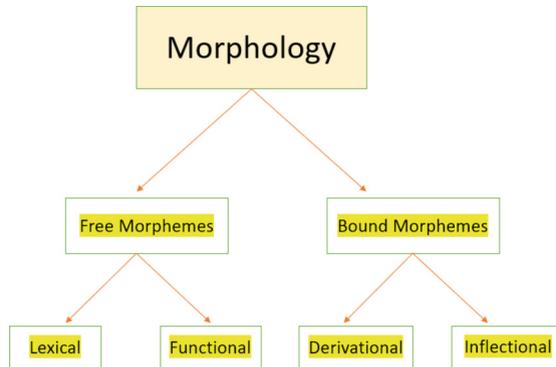
- 1 What is the frequency used in students' essays across proficiency levels?
- 2 What is the range of morphemes used in students' essays?
- 3 Is there a relationship between the range of morphemes used in students' essays and essay scores?

According to previous research, it has been established that there is a significant correlation between morphology and reading proficiency, such as vocabulary words in a text, and reading comprehension (Northey 2013). However, my small-scale research study for this paper is significant because very few studies have been conducted on the topic of how morphological analysis may contribute towards writing quality in the context of Dubai, United Arab Emirates (UAE). The research will morphologically analyse students' essays; thus, it is advantageous for English teachers to better understand whether there is a relationship between the variety of morphemes used in students' essays and essay scores.

## 2 Literature Review

To begin with, morphemes are the minimal units of meaning or grammatical function (Wolter & Pike 2015). Hence, the study of word formation and internal structure, including components like root words and affixes, is known as morphology (Nippold 2016). For instance, the root word "talk", if we add the suffix "plural s", it will be "talks". Another example is "happy" which is considered the root word, by adding the prefix "un" it will be "unhappy". Free morphemes have a distinct meaning and can stand alone (e.g. eat, date). However, bound morphemes make it impossible for it to function as a standalone word. It includes both suffixes and prefixes (e.g. -s, re-, un) (Carlisle 2003). Furthermore, free morphemes come in two varieties: lexical and functional. Lexical morphemes have a meaning and can stand alone as a word. It includes verbs, nouns, and adjectives; for example, girl, boy, and smart. The functional morphemes include articles, conjunction, and pronouns. Derivational and inflectional morphemes are the two types of bound morphemes. The first type is derivational morphemes which alter the part of speech. It brings about a change in the existing word and introduces a new word in a language. For example, (care) and (careless). The part of speech of a word is not altered by inflectional morphemes such as boys (plural s), Jim's purse ('s) (Brady 2021). These definitions are adopted as the authors provided a thorough explanation of the definition of the morphemes and their types clearly.

The theory that supports this paper is "Structuralism" (Levi-Strauss 1973; Jakobson 1976), which emphasised the morpheme concept and categorised syntax as a derivative of morphotactics (i.e., combining morphemes). Put simply, structuralism views language as a set of descriptive and analytical procedures. Analysis of the language can be structured as (a) semantics, (b) syntactic (c) morphological (d) phonological (Siddiqi & Harley



**Fig. 1.** Morphology and its types (Harley, 2014)

2016). Although this theory is well-established within the field of linguistics, it has been criticised by some linguists who argue that merely using morphemes to replace the notion of words has its limitations. However, for the purpose of this paper, structuralism is used as a theoretical foundation (Fig. 1).

The importance of morphology integration into literacy lessons as an intervention strategy is generally acknowledged across research (Gilbert 2020). In primary grades, morphological instruction includes teaching students affixes, and root words as a technique for utilising these word parts to develop meanings for new terms (Manyak, Baumann & Manyak 2018). Numerous studies have demonstrated the importance of morphological analysis in recognising words, vocabulary comprehension, and spelling when writing (Ash & Baumann 2017). In elementary schools, approximately 60% of the words that students come across in texts are words that consist of derivational morphemes, meaning base words and affixes (Fejzo, Desrochers & Deacon 2018). This has shown that teaching affixes such that students learn how to use them accurately with familiar lexical items, can increase their understanding of unfamiliar words that use affixes, and they may even deduce the meanings of these words (Schultz 2021). Ultimately, the main aim of teaching morphology is to improve students' capacity to determine word meanings, because the study of word components aids in writing skills (Apel & Werfel 2014).

There is a body of research which demonstrates that morphological knowledge plays a role in both text production and spelling, especially for students who are struggling with writing (McCutchen et al. 2014). The representation of relevant morphemes in essay writing is more difficult for students who have written language issues compared to their peers (Rubin & Laboratories 1988); for example, poor spellers have difficulty identifying the distinctions between root morphemes and word affixes. In contrast to the research on spelling accuracy, additional research has shown that reading-problematic pupils struggle to apply morphological rules to novel words (Brittian 1970 et al. in Rubin & Laboratories 1988). As a result, students tend to employ derivational morphemes in writing later than inflectional morphemes (Northey, McCutchen & Sanders 2016). A general but possibly incorrect viewpoint is that derivational morphemes are either too challenging for students or are not crucial for students' literacy development all the way up until middle school

level (Carlisle 2003). These assumptions give rise to the practice of neglecting either derivational or inflectional morphology instruction in primary and middle school (ibid). Despite the fact that morphological acquisition is viewed as it is related to grammatical development, learning, or acquiring morphology goes beyond grammatical and structural rules (syntax) (Marinova-Todd, Siegel & Mazabel 2013). Essay writing appears to be related and more pronounced to the capacity to analyse written texts using morphological components (Perfetti 1999). Ultimately, the literature review has covered three major themes about morphology which are (a) morphological instruction across proficiency levels, (b) morphological awareness, and (c) morphological skill in essay writing. This paper contributes to the existing body of literature by adding information on the frequency and the range of morphemes used in students' writing and essay scores within the context of the UAE.

### 3 Methodology

To address the research questions, the mixed methods design was conducted to view the findings from different angles instead of relying on a single approach (Denscombe 2017). A stratified random sampling was carried out where the researcher ensured that various groups are included. First of all, I divided the students into groups or strata according to their levels (high, average, and low). Then, each stratum was sampled randomly. I chose this technique as it is a practical combination of randomization and categorization that makes it possible to conduct both quantitative and qualitative research (Cohen, Manion & Morrison 2017). I classified the marks according to the students' levels.

<b>High Achievers</b>	<b>Average</b>	<b>Low Achievers</b>
From 9-10 out of:10	From 6-8 out of:10	From 4-5 out of:10

The participants in this study were female students from different nationalities, aged between 17 to 18 years old, studying at an American school in Dubai. I analysed 9 essays written by these participants and categorised them according to the level of their writing proficiency, as determined by their teacher. From the quantitative perspective, numeric data was collected by representing the frequency of students' essays across proficiency levels. As for the qualitative design, the range of morphemes used in students' essays had been identified, and color-coding was used to identify the range of morphemes used in students' essays. To ensure validity for quantitative design, normality was tested before proceeding with the Pearson analysis to ensure that the data were normally distributed. Furthermore, I ensured all standard steps were taken to ensure this study met the expectations of ethical considerations, as determined by the British University in Dubai (Table 1).

**Table 1.** Research design

Research Questions	Approach	Instrument	Participants	Data Analysis
What is the frequency used in students' essays across proficiency levels?	Quantitative	Quantitative document analysis	9 students (essays)	SPSS (Pearson Correlation)
What is the range of morphemes used in students' essays?	Qualitative	Qualitative document analysis	9 students (essays)	Color-Coding
Is there a relationship between the range of morphemes used in students' essays and essay across?	Both (Quantitative + Qualitative)	Quantitative + Qualitative document analysis	9 students (essays)	SPSS + Color-Coding

## 4 Findings

This section contains an overview of the study's findings. This part is essential in order to describe the data that was examined and provide an explanation for the research questions. As previously stated, the research question for the quantitative design was "What is the frequency used in students' essays across proficiency levels?".

The frequency of the high achievers:-

Frequency	Student 1	Student 2	Student 3
Lexical	188	351	192
Functional	335	718	263
Derivational	14	25	19
Inflectional	35	74	40

The frequency of the average students:-

Frequency	Student 1	Student 2	Student 3
Lexical	179	168	217
Functional	282	246	315
Derivational	14	7	6
Inflectional	35	35	51

The frequency of the low achievers:-

Frequency	Student 1	Student 2	Student 3
Lexical	19	135	77
Functional	17	303	102
Derivational	0	3	6
Inflectional	5	14	19

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Grade	.240	9	.144	.851	9	.076
Total	.277	9	.046	.876	9	.143

a. Lilliefors Significance Correction

The data were normally distributed, as assessed by Shapiro-Wilk's test ( $P > .05$ ).

Correlations			
		Total	Grade
Total	Pearson Correlation		.706*
	Sig. (2-tailed)		.034
	N		9
Grade	Pearson Correlation		
	Sig. (2-tailed)		
	N		

\*. Correlation is significant at the 0.05 level (2-tailed).

There was a statistically significant, strong correlation between the range of morphemes used in the essays and essay scores in female students aged 17 to 18 years,  $r = .706$ ,  $P < .05$ .

As for the research question of the qualitative design “what is the range of morphemes used in students’ essays?” color-coding was implemented wherein 9 essays were analysed morphologically. Consequently, some of the key conclusions drawn from these essays are as follows:

#### 4.1 Comparison of Morphological Skills Used in Students’ Writing

High achievers:-

The range of morphemes	Student 1	Student 2	Student 3
<b>Lexical</b>	Many examples such as “children, Quran, family friend, find etc”	Many examples such as “life, grade, high, school, place etc”.	Many examples such as “person, broad, shabby, almond, help etc”
<b>Functional</b>	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers, Question words	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers.	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers, Question words
<b>Derivational</b>	ing, ly, ness, al, ed, ful. Such as happiness, deeply, peaceful etc. “	ing, ly, tion, er, ed. Such as “constantly careless, reflection, shaped, stranger etc.”	ing, ly, ed, ful. Such as shaped, soothing, thoughtful etc. “
<b>Inflectional</b>	ed, ing, 's, -es, -er, -s such as plays, come, friends etc.”	ed, ing, -s, -es, -er such as “compared, younger, lights, shared etc”.	ed, ing, -es, -est, -s, 's such as lightest, writing, clothes, smelled, friends, aunt's etc.”

Average students:-

The range of morphemes	Student 1	Student 2	Student 3
<b>Lexical</b>	Many examples such as “dark, brown, hair, angry, summer, camp etc”	Many examples such as “person, best, friend, spent, necessity, awesome etc”	Many examples such as “play, hit, blue, sharp, name etc”
<b>Functional</b>	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers.	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers, Question words	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers.
<b>Derivational</b>	ing, ly, ment, -ive, tion, er, or, ed. Such as “encouragement, supportive, instructor, teacher, Sadly, appreciation etc.”	ing, ly, er, ful. Such as truly, painter, cheerful, amazing etc. “	ing, ed, ic. Such as “burning, artistic, spiced etc.”
<b>Inflectional</b>	ed, ing, -s, -es such as “created, living, lessons, memories etc”.	ed, ing, -ist, -s such as finest, realized topics etc.”	er, ing, -s, -es such as “Days, slower, stories, running etc”.

Low achievers:-

The range of morphemes	Student 1	Student 2	Student 3
<b>Lexical</b>	Many examples such as “mum, contact, family, sister etc”	Many examples such as “hard, person, time, happy, power etc”	Many examples such as “play, hit, blue, sharp, name etc”
<b>Functional</b>	Pronouns, Conjunctions, prepositions.	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers.	Pronouns, Conjunctions, prepositions, Determiners, Quantifiers, Articles, Auxiliary verbs, Modals, Qualifiers.
<b>Derivational</b>	NONE	Ful, ed “beautiful, shaped”	ing, ment, er, ed, ness. Such as “understanding, listener, entertainment, tenderness”.
<b>Inflectional</b>	’s, such as “mum’s”	ed, ing, -s, -est such as “reasons, highest, talking etc”.	est, -s, -es such as “activities, areas, greatest etc”.

Morphemes can be joined in a variety of ways to convey certain meanings or to fulfil specific grammatical functions. The essays reveal that the vast majority of students used lexical and functional morphemes compared to other morphemes. For example, “she had those round eyes that I can never seem to forget when she crosses my mind”. However, the number of inflectional and derivational morphemes used in the essays varied across proficiency levels. For instance, the high achievers used a variety of derivational, inflectional morphemes such as “she has pale skin with light brown hair, light brown eyes, and beautiful freckles, I honestly find her one of the most beautiful people I have ever met”. Despite the fact students used a lot of lexical and functional morphemes, it

can be seen evidently that students used a variety of derivational and inflectional in the same sentence “three derivational morphemes and two inflectional morphemes”. Students’ lexical knowledge and high-calibre writing are significantly influenced by their grasp of morphology. As for the average students, the researcher noticed that students used a variety of morphemes but not as much as the high achievers’ ones, for example, “Yasmin has big gorgeous curly hair and she always looks stunning”. This sentence is derived from an average student essay, it can be inferred that the sentence contained a good number of lexical morphemes and only one derivational morpheme “ly”, and one inflectional morpheme “s”. Regarding the low achievers, the students provided little derivational and inflectional morphemes. They mainly focused on lexical and functional which was easier for them than the use of derivational and/or inflectional morphemes. For example, “My mom is my best friend in my life, and my first human that she came to in my head”. It is evident that the low achievers did not provide any of the inflectional or derivational morphemes in the sentence which affected the overall score. Due to a lack of vocabulary, they were able to write a range of lexical and functional morphemes but were unable to add affixes to the base word.

## 4.2 Using Morphology at the Text Level

Using a variety of morphemes improves the quality of students’ writing and consequently, will lead to a better score. Students utilize inflectional morphemes more frequently than they do with derivational morphemes. Therefore, the production of derivational morphemes develops later than their use of inflectional morphemes in writing. For example, one of the weak students stated “she was my favorite mum’s sister in mum’s family mum’s sister maryam she lives in Kuwait” she was able to use inflectional morphemes frequently but was unable to produce any derivational morphemes. As for syntactic structure, the researcher noticed that the weak writers relied mainly on the basic organisational markers such as, because, also, when etc., which hinders the flow of their writing. For instance, “This two they come first thing in my head because and the first one and my first and favorite human she was my mom and the second person”, this student has overly produced connector words “because, and” and tends to use less variety of the word choice and syntax. The high achievers, in contrast, utilised a wider range of organizational markers and syntactic structure efficiently. For example, “since the last time I saw him I can’t picture him physically, but I remember his personality. He was so dynamic and talkative compared to me who was reserved”. Additionally, morphological skills enabled the high achiever students to generate complex sentences and multi-sentence as stated: “he is just the scrawny boy that I picked a fight with when I was younger”. It smoothes the syntax and gives more nuance to the meaning. As for the average students, they were good at generating complex sentences too. For instance, “Even though she lives ten thousand kilometers away, she feels like she’s right next to me”. Lastly, the low achievers, most of them write little to no complex sentences within the essay adequately. Finally, to answer the third research question “Is there a relationship between the range of morphemes used in students’ essays and essay scores?”. According to the findings stated above, there is indeed a relationship between the range of morphemes used in students’ essays and their actual essay scores. This phenomenon will be discussed further in the subsequent section.

## 5 Discussion and Conclusion

The research questions of this study were: 1- What is the frequency used in students' essays across proficiency levels? 2- What is the range of morphemes used in students' essays? 3- Is there a relationship between the range of morphemes used in students' essays and essay scores? A mixed method study was conducted due to several reasons, one of the reasons is that with the use of a mixed approach, a phenomenon may be understood completely and thoroughly (Cohen, Manion & Morrison 2017); and it may help to answer the research questions more meaningfully. Overall, the data analysis revealed that morphological skill contributes significantly to students' writing development. Hereby, there is a strong relationship between the range of morphemes used in students' essays and essay scores. As a result, the higher the variety of morphemes used in students' essays, the better the scores. Also, the researcher compared the morphology used in students' essays across proficiency levels and found that a variety of morphemes was utilised by high achievers, which most likely enabled them to attain high scores. Thus, using various combinations of morphemes assists in enhancing the writing quality as well as conveying certain meanings or fulfilling specific grammatical functions.

Despite the fact that much linguistic study has concentrated on the discipline of phonology, various studies on language and literacy development have stressed the importance of morphology, another area of linguistics that goes beyond phonology. Researchers with this perspective stressed how crucial it is to cultivate morphological skills in order to enhance the learning process of reading and writing mutually (Carlisle 2003; Perfetti 1999). Thereby, there is strong evidence that morphological knowledge helps in developing students' writing (Goodwin & Ahn 2013; Northey, McCutchen & Sanders 2016). The development of high-quality writing is substantially correlated with morphological competence and literacy. This finding is in line with a growing body of research in the fields of education and psychology that emphasizes the significance of morphology which indicates that morphological skill should be included as an essential component of literacy instruction (Gilbert 2020).

As discussed earlier, there are four main types of morphology which are: functional, lexical, derivational, and inflectional. These types play a significant role in academic writing wherein practice is the key to naturally acquiring these kinds of morphology. According to research, explicit instruction of derivational and inflectional morphemes is necessary to support the continuous development of morphology and syntactic (Marinova-Todd, Siegel & Mazabel 2013). Therefore, recognising the words, comprehending the texts, spelling, and vocabulary would be reinforced among English language learners as well as monolinguals. Apel & Werfel (2014) argued that there is a mutual relationship between morphology and written language which facilitates the acquisition of morphological competence. This paper contains a number of limitations that should be noted. To start with, the sample size was relatively small due to the shortage of time by the researcher. Also, this study does not represent the population. Therefore, it would be better to have more students' essays from different levels of the k-12 sector to represent the entire population. In addition, it is better to consider male students since the researcher focused on female students only.

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