

Morphemic Analysis Awareness: A Boon or Bane on ESL Students' Vocabulary Learning Strategy

Chandrakala Varatharajoo, Adelina Binti Asmawi, Nabeel Abdallah Mohammad Abedalaziz

Abstract—This study investigated the impact of inflectional and derivational morphemic analysis awareness on ESL secondary school students' vocabulary learning strategy. The quasi-experimental study was conducted with 106 low proficiency secondary school students in two experimental groups (inflectional and derivational) and one control group. The students' vocabulary acquisition was assessed through two measures: Morphemic Analysis Test and Vocabulary-Morphemic Test in the pretest and posttest before and after an intervention programme. Results of ANCOVA revealed that both the experimental groups achieved a significant score in Morphemic Analysis Test and Vocabulary-Morphemic Test. However, the inflectional group obtained a fairly higher score than the derivational group. Thus, the results indicated that ESL low proficiency secondary school students performed better on inflectional morphemic awareness as compared to derivatives. The results also showed that the awareness of inflectional morphology contributed more on the vocabulary acquisition. Importantly, learning inflectional morphology can help ESL low proficiency secondary school students to develop both morphemic awareness and vocabulary gain. Theoretically, these findings show that not all morphemes are equally useful to students for their language development. Practically, these findings indicate that morphological instruction should at least be included in remediation and instructional efforts with struggling learners across all grade levels, allowing them to focus on meaning within the word before they attempt the text in large for better comprehension. Also, by methodologically, by conducting individualized intervention and assessment this study provided fresh empirical evidence to support the existing literature on morphemic analysis awareness and vocabulary learning strategy. Thus, a major pedagogical implication of the study is that morphemic analysis awareness strategy is a definite boon for ESL secondary school students in learning English vocabulary.

Keywords—ESL, instruction, morphemic analysis, vocabulary.

I. INTRODUCTION

It is difficult to ignore the importance of vocabulary in learning or acquiring any language. Vocabulary knowledge is essential in reading, comprehension and communication.

According to [1], both comprehension and fluency are affected if learners have inadequate vocabulary. Thus, it is imperative for educators to expose learners to vocabulary learning strategies that will serve them throughout their lifetime. This is because knowing, understanding, and using words are essential for language development [2].

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Recent developments in language learning have heightened the need for vocabulary acquisition [3]. They assert that vocabulary is important because the delay in its acquisition often imposes a handicap on learners' language growth and also communication [4]. According to [5], sounds, grammar, and vocabulary are three principle components of language and among these components vocabulary plays an essential role in language learning because words are the building blocks of language. According to [6], both comprehension and fluency are affected when learners have inadequate vocabulary. Hence, vocabulary plays an utmost essential role in second language learning (ESL) context. As [7] claims, "without grammar, very little can be conveyed, without vocabulary nothing can be conveyed".

With respect to the great influence of vocabulary in language learning, many studies have explored the use of vocabulary learning strategies to foster the knowledge of words. Among these, the use of morphemic cues or morphemic analysis is recommended as a strategy to decode words meaning [5]. According to [8], morphemic analysis, which means analyzing word parts, is deemed as a very practical strategy used to unlock the meanings of many polymorphemic words, i.e. complex words that are composed of two or more morphemes. Around 88,700 word families of English language are found in high school books and many of these are formed derivatively (e.g., adapt-adaptation, adaptive, adaptable) [8]. This finding is further supported by [9] who claimed that morphemic awareness is essential to learners because secondary school texts contain many complex words; and if the learners could unlock the meaning of these complex words effectively they can be successful language users.

The purpose of this study is to find whether morphemic awareness is a boon or bane for ESL low proficiency learners to acquire vocabulary effectively. It is significantly important for ESL context because there is no one distinctive approach proven to be the most effective way to teach vocabulary throughout the history of language learning. Also learners with weak vocabulary are in dire need of a more direct instruction for vocabulary acquisition. According to [10], research into ESL instruction shows that there is any universally or best way to teach vocabulary; although, certain approaches are likely to prove more effective in certain situations, blanket prescription is tricky to support theoretically. Having said that, this study is designed to examine the effects of morphemic analysis strategy as a means for acquiring vocabulary among upper secondary school students, in Malaysian ESL context. The study aims to introduce a practical way of learning morphologically complex words effectively. In doing so, this

study attempts to investigate whether inflectional and derivational morphemic awareness has an impact on vocabulary development. Its secondary aim is to explore whether the results obtained will confirm the findings of previous studies conducted in the language learning settings.

Previous studies done at secondary and tertiary levels in Malaysian ESL context [11]-[18] have argued that inadequacy of vocabulary contributed to learners' incompetence in fluency and comprehension. Researchers such as [19]-[21] unanimously confirmed that one major reason for the lack of vocabulary among these learners is because they have a poor understanding of the linguistic aspect of English language. Linguistically, there are three main aspects in a language: the morphological level (morpheme), the lexical level (word order) and the syntactic level (sentence structure) [20]. However, for the purpose of this study, it looks at the morphological level. Morphological level is chosen over the other two because morphemes are the basis for complex words; and learners need to understand words before progressing into syntactic level. As [22] claims when learners understand how words are formed by combining prefixes, suffixes, and roots they will have a larger vocabulary repertoire that leads to better text comprehension. On the other hand, when students make morphological errors their incompetence in the language will be reflected through their vocabulary [21]. Thus, if this issue is not solved promptly it would be an ongoing concern in the area of ESL vocabulary research [20].

In the present study, two types of the morphemic process words including inflection and derivative were taken into consideration in order to examine students' morphemic awareness and vocabulary knowledge. To do this, two types of measures: Morphemic Analysis Test (adapted from [23]) (Fig. 1) and Morphemic-Vocabulary Test (adapted from [24], [25]) (Fig. 2) were administered for both control and experimental groups in the pretests and posttests. There were two sub-tasks in the Morphemic Analysis Test: Inflectional Morphemic Analysis Test and Derivational Morphemic Analysis Test. It is imperative to take two different aspects of morphological knowledge into account because both aspects would be significant in fostering vocabulary knowledge [26].

Hence, the following research questions were raised: 1. Is there a significant effect of learning inflectional morphemes on students' inflectional morphemic analysis knowledge? 2. Is there a significant effect of learning derivational morphemes on students' derivational morphemic analysis knowledge? 3. Is there a significant difference between learning inflectional morphemes and learning derivational morphemes on students' vocabulary development? The hypotheses were: 1. There is no significant effect of learning inflectional morphemes on students' inflectional morphemic analysis knowledge. 2. There is no significant effect of learning derivational morphemes on students' derivational morphemic analysis knowledge. 3. There is no significant difference of learning inflectional morphemes and learning derivational morphemes on students' vocabulary development.

Complete the sentences by adding "ed" or "ing"

1. Laugh: Everyone is _____ at the clown.
2. Cross: We quickly _____ the street because there were too many cars.

Complete the sentences by adding "dis" or "un"

1. Familiar: New and _____ people make the children restless.
2. Avoidable: The accident was _____

Fig. 1 Morphemic Analysis Test

Identify the smallest units in words.

1. Ensure = _____ + _____ + _____
2. Within = _____ + _____ + _____

Write the correct base word of the word given.

1. Growth .She wanted her plant to _____ well.
2. Description. The picture is difficult to _____.

Circle the form of the word that best completes the sentence.

1. His _____ changed as he got older.
a) personify b) personal c) personality d) personalize
2. It can be _____ to sell lemonade in the summer.
a) profit b) profitably c) profitable d) profitability

Fig. 2 Morphemic-Vocabulary Test

This paper is organized as follows: Section II provides an overview of the morphemic analysis and vocabulary proposed in literature. Section III describes the data collection process. Section IV reports the study analysis and discusses its results. Finally, Section V concludes the paper and discusses future work.

II. RELATED WORK

The theoretical framework of this study is based on morphemic analysis strategy. Words are made of morphemes and morphemes are the minimal meaningful linguistic units so students can meanings by disassembling complex words into meaningful parts [27]. According to [28], affixes and base words carry meaning, which in turn supports the understanding of a morphologically complex word. Likewise it is noted that morphemes can be used to derive the meaning of a word [26]. The practice of this reflecting and manipulating is called morphemic analysis.

Words are the primary carriers of meaning, and it is recognized that there is a strong relationship between the individual's vocabulary size and their language proficiency [29], [30]. Understanding the relation between vocabulary and language proficiency helps in explaining some practical issues pertaining to strategies for teaching and learning vocabulary. According to [31], vocabulary learning strategy is the process where vocabulary is obtained, stored, retrieved and used. In addition, the understanding of this relation helps teachers and learners to adopt various strategies for teaching and learning vocabulary. One of the strategies of word instruction is using morphology. Morpheme helps learners to identify and determine the meaning of an unfamiliar and complex word [32].

Vocabulary strategies are methods utilized by learners to deduce the meaning of an unknown complex word when

encountering it in text [33]. Morphemic analysis is a vocabulary learning strategy that breaks down morphologically complex words into their constituent morphemes (prefixes, suffixes and roots) [8]. In particular, morphemic analysis is a strategy students use to assess word meanings. For example, the word *seller* is comprised of two meaning units, the base *sell*, and the inclusion of *-er*, which conveys the meaning of a person that does whatever is implied in the base, thus, the seller is one who sells. As students proceed into higher grades, their texts will gradually grow sophisticated; thus the ability to recognize roots and affixes can assist students as they infer and retain the meanings of this surge of unfamiliar complex words, not only in language but also across disciplines. As noted by [33], "It is in the academic arena that students will come across an influx of content specific vocabulary throughout the curriculum".

Morphologically complex words are formed through three processes: compounding, inflectional and derivational [34]. This study focuses on inflectional and derivational as these two processes occupy most complex words in English language. There are only eight inflectional affixes in English, and all are suffixes, and they are stable in function and meaning [35]. Inflection indicates grammatical relationship between words in a sentence, e.g., *the girl sells flowers / girls sell flowers*. Inflectional morphology is an early acquired competence even though individual differences exist, especially with *-s*, *-ed*, *-ing*, *-er*, and *-est* [36]. Derivatives are formed by adding affixes to base words (e.g., *nation - national*, *nationalist* and *nationalization*). As there are a large number of derivational affixes (e.g., *-ness*, *-ly*, *-al*, *-able*, *-er*, etc) and the process involves phonological or/and orthographic changes (e.g., *decide- decision*, *strong- strength*), the understanding of derivatives appears later and persists to expand until early adulthood [37].

Morphemic analysis is highly recommended as a strategy to unlock word meanings in the ESL context [38]. This is because the need to develop morphemic awareness among ESL learners would be recognized. As morphemes carry the majority of a word's meaning, morphemic analysis strategy can assist learners to identify the meanings morphemes before unlocking the meaning of the complex words. According to [26], morphemic awareness provides learners with two types of abilities: analytic aspect (the ability to break down complex words into smaller meanings) and synthetic aspect (the ability to create complex words) which are important to decode word meanings.

Despite the importance of morphemic awareness, only selected studies have focused largely on its role in vocabulary development recently [5], [26], [38]-[41]. The result of analysis of [5] indicated a significant relationship between the students' vocabulary knowledge and morphological awareness. It is a strong belief that morphological knowledge could be utilized as an effective strategy in building vocabulary knowledge [38]. Morphological awareness is uniquely associated with vocabulary knowledge and their results emphasize the potential importance of different aspects of morphological awareness for vocabulary acquisition [26].

Learners could develop their lexical knowledge better by applying morphological analyses rather than through traditional class instruction methods in the ESL context [39]. However, [42] revealed no relationship between morphological awareness and vocabulary knowledge of the subjects. The results also indicated that the students' overall morphological awareness and vocabulary size were limited. These findings were further confirmed by [41] that their results indicated that the students have limited awareness in both analytic and synthetic aspects of morphemic analysis. In fact, the students performed poorly on the synthetic task compared to the analytical task.

Based on the both positive and negative feedback from the above mentioned studies, this current study is set to further confirm whether morphemic awareness would or not significantly relate to vocabulary development. The researcher was also motivated to explore if morphemic awareness can be regarded as an effective strategy in vocabulary learning in Malaysian ESL context.

III. DATA COLLECTION PROCESS

The research design was a quasi-experimental pretest-treatment-posttest design with one control group and two experimental groups. Quasi-experimental evaluations are intervention studies that attempt to determine the impact of an intervention by comparing a treatment group to a comparison group without random assignment. It included non-equivalent groups and pretests and posttests.

The research was carried out at a secondary school in Kuala Lumpur. 106 low proficiency male and female students aged 16, from three intact groups of one school participated in this study. Intact Group 1 (n=36) was selected as the inflectional group; intact Group 2 (n= 35) as derivational and intact Group 3 (n= 35) as control.

There were three phases involved in this study. In the first phase, morphemic analysis test and vocabulary test were administered as a pretest to both control and experimental groups. The second phase was the intervention phase where experimental Group 1 received inflectional analysis instruction meanwhile Group 2 received derivational analysis instruction morphemes for seven weeks. The control group did not receive any treatment. The third phase is the posttest phase where morphemic analysis test and vocabulary test were administered again to both groups to determine the success of the morphemic analysis instruction on vocabulary development. Time limit was not set for the tests. It is important as it minimizes students' fatigue and anxiety and the results of the study would not be jeopardized. Fig. 3 represents the three phases in detail.

The target structures for the treatment program were selected based on the three criteria. First, a list of universal problematic morphological structures was identified from both foreign and local studies in the ESL context. Second, the researcher, a 15 year experienced language teacher, found that Malaysian secondary school students also make universal types of morphological errors and that the patterns of mistakes are rather common. Third, the target structures were judged

and chosen by four language experts from two local universities and secondary schools from the highest frequency affixes by means of a Likert Scale. Therefore, based on the finding above, inflections (-s, -ing) and derivatives (un-, dis-) were chosen. It is recommended that a limited and focused structure should be introduced so that an effective outcome can be achieved [43].

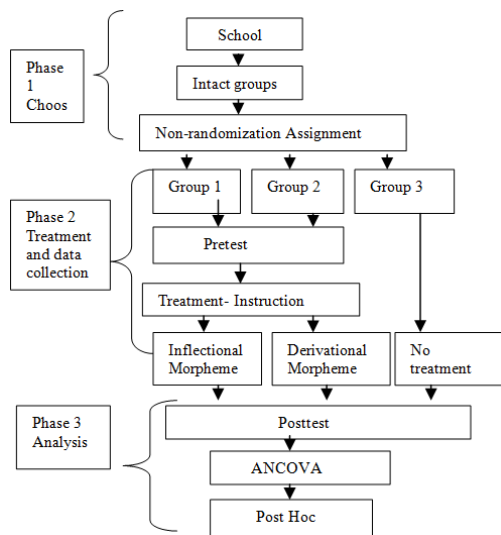


Fig. 3 The research procedure of the study

TABLE I
CONTENT FOR MORPHEMIC ANALYSIS INSTRUCTION

Week	Group	Lesson	Targeted Morpheme	Activities
1	1	Inflectional morphemes	Suffix <i>ing</i> (continuous tense)	Preparation
			<i>ed</i> (past tense)	Presentation
1-7	2	Derivational morphemes	Prefix <i>un</i> (not)	Practice
			<i>dis</i> (opposite of)	Evaluation Expansion

The lesson plan was prepared for each target structure based on the related topic and tasks of the Upper Secondary Textbook used in the institution. The textbook covers all the target structures of the study, so it was deemed suitable as an authentic text and source book for the intervention. However, some adaptations were made in line with the objective of the current study.

The instructional procedure (Table I) used in the treatment phase is called analytic instruction as explained in the CALLA model [44]. Analytic instruction refers to explicit, focused attention to specific language features [45]. CALLA recommends instructions in five phases: preparation, presentation, practice, and evaluation and expansion activities [46]. First is preparation: teacher identifies students' prior knowledge about the content and their current use of specific strategies. Second is presentation: teacher models, names, and explains new strategies. Third is practice: students practise new strategies in subsequent practices and teacher encourages independent strategy use. Next is self-evaluation: students evaluate their own strategy use immediately after practice. Final is expansion: students transfer the strategy to new tasks.

A pilot study was conducted to test the reliability of the instruments. The Cronbach's alpha reliability indices were calculated each measure used in this study (Table II).

A test that has an alpha index more than 0.70 is regarded to have high reliability standard and is appropriate for classroom tests [47].

TABLE II
RELIABILITY CRONBACH'S ALPHA OF INSTRUMENTS

Test	No of Items	Alpha
Morphemic Analysis Test	30	0.75
Vocabulary-Morphemic Test	30	0.78

IV. STUDY ANALYSIS AND RESULTS

SPSS version 22 was employed to analyze the data collected. Analysis of covariance (ANCOVA) and Multiple Comparison (Post Hoc) were used to analyze the data in order to find the effectiveness of the morphemic analysis awareness on vocabulary acquisition. No assumptions were violated in this study.

Results indicated that after controlling for the effect of the pretest, there was a significant difference between experimental and control group in inflectional morphemic analysis knowledge, $F(1, 68) = 43.24, p = .00, \eta^2 = .389$. The partial Eta squared value of .389 showed that 38.9% of the variance in the dependent variable (inflectional morphemic analysis) was explained by the independent variable (group) as shown in Table III.

TABLE III
ANCOVA FOR INFLECTIONAL MORPHEMIC ANALYSIS AS A FUNCTION OF GROUP, USING PRETEST SCORES AS COVARIATE

Source	Df	Mean Square	F	Sig.	Partial Eta Squared
Pretest	1	.45	.20	.65	.00
Group	1	94.72	43.24	.00	.38
Error	68	2.19			
Total	71				

TABLE IV
UNADJUSTED AND ADJUSTED GROUP MEANS AND VARIABILITY FOR INFLECTIONAL MORPHEMIC ANALYSIS, USING PRETEST SCORES AS COVARIATE

Group	Unadjusted			Adjusted		
	N	M	SD	M	SE	
Experimental	36	5.36	.26	7.86	.25	
Control	35	5.40	1.43	5.36	.26	

Table IV shows that students in the experimental group ($M = 5.36, SD = .261$) scored significantly higher than students in the control group ($M = 5.40, SD = 1.43$). Thus, the null hypothesis was rejected. There is a significant effect of learning inflectional morphemes on students' inflectional morphemic analysis knowledge.

Results indicated that after controlling for the effect of the pretest, there was a significant difference between experimental and control group in derivational morphemic analysis knowledge, $F(1, 67) = 10.92, p = .002, \eta^2 = .140$. The partial Eta squared value of .140 showed that 14% of the variance in the dependent variable

(derivational morphemic analysis) was explained by the independent variable (group) as shown in Table V.

TABLE V
ANCOVA FOR DERIVATIONAL MORPHEMIC ANALYSIS AS A FUNCTION OF GROUP, USING PRETEST SCORES AS COVARIATE

Source	df	Mean Square	F	Sig.	Partial Eta Squared
Pretest	1	9.57	3.68	.059	.052
Group	1	28.39	10.92	.002	.140
Error	67	2.60			
Total	70				

TABLE VI
UNADJUSTED AND ADJUSTED GROUP MEANS AND VARIABILITY FOR DERIVATIONAL KNOWLEDGE, USING PRETEST SCORES AS COVARIATE

Group	Unadjusted			Adjusted	
	N	M	SD	M	SE
Experimental	35	7.17	2.00	7.13	.274
Control	35	6.20	1.18	6.14	.274

Table VI shows that students in the experimental group ($M=7.17$, $SD=2.00$) scored significantly higher than students in the control group ($M=6.20$, $SD=1.18$). Thus, the null hypothesis was rejected. There is a significant effect of learning derivational morphemes on students' derivational morphemic analysis knowledge.

TABLE VII
UNADJUSTED AND ADJUSTED GROUP MEANS AND VARIABILITY VOCABULARY POSTTEST TOTAL SCORES OF EXPERIMENTAL GROUPS AND CONTROL GROUP AS DEPENDENT VARIABLE PRETEST SCORES AS COVARIATE

Group	Unadjusted			Adjusted	
	N	M	SD	M	SE
Inflectional	36	23.11	2.05	23.11	.317
Derivational	35	19.57	1.29	19.57	.321
Control	35	13.65	2.41	13.65	.321

Table VII shows that students in the inflectional group ($M=23.11$, $SD=2.05$) and derivational group ($M=19.57$, $SD=2.29$) scored significantly higher than students in the control group ($M=13.65$, $SD=2.41$). However, there are significant differences existed among the experimental groups in vocabulary achievement as shown in Table VIII.

TABLE VIII
COMPARISON OF INFLECTIONAL AND DERIVATIONAL GROUPS WITH VOCABULARY POSTTEST TOTAL AS DEPENDENT VARIABLE

	Inflectional	Derivational	Control
Inflectional	-----	3.54	9.45**
Derivational	-----	-----	5.91**

Tables IX and X indicate that students in the inflectional group obtained a significantly higher mean score ($M=23.11$, $SD=2.05$) than did the students in the derivational group ($M=19.57$, $SD=2.41$) on vocabulary achievement. Thus, the effect of learning inflectional morpheme is more significant than learning derivational morphemes on the vocabulary test of ESL secondary school learners in this current study. Thus, the proposed null hypothesis was rejected. There is a significant effect of learning inflectional morphemes than

learning derivational morphemes on students' vocabulary achievement.

TABLE IX
COMPARISON OF INFLECTIONAL AND DERIVATIONAL GROUPS WITH VOCABULARY POSTTEST TOTAL AS DEPENDENT VARIABLE

Means differences		
Group	Inflectional	Derivational
Inflectional	-----	9.45
Derivational	-----	-----

* $p < 0.05$

TABLE X
COMPARISON OF INFLECTIONAL AND DERIVATIONAL GROUPS WITH VOCABULARY POSTTEST TOTAL AS DEPENDENT VARIABLE

Means differences		
Group	Inflectional	Derivational
Inflectional	-----	-----
Derivational	-----	5.91

* $p < 0.05$

V. CONCLUSIONS AND FUTURE RESEARCH

The current study was aimed to provide empirical data to explore the effectiveness of two features of morphemic analysis awareness: inflectional and derivational on ESL low proficiency secondary school students' vocabulary development. The findings of the current study can be mentioned in two main discussions. The first and second research question results revealed that individual instructions in two types of morphemic awareness have contributed significant results on inflectional and derivational awareness among the ESL low proficiency secondary school students. Nevertheless, derivational morphology explained a significant but relatively smaller amount of effect on ESL low proficiency secondary school students' morphological awareness compared to inflectional morphology.

The second discussion is that the third research question results revealed that the awareness of inflectional and derivational morphology was found significantly related to vocabulary achievement of ESL low proficiency secondary school students. However, inflectional morphemic awareness had higher significant effect on ESL low proficiency secondary school students' vocabulary achievement.

In brief, the results indicated that ESL low proficiency secondary school students performed better on inflectional morphemic awareness as compared to derivational morphemic awareness. Also that inflectional morphemic awareness had a better contribution on morphemic awareness and vocabulary achievement among the students in this study.

The finding of this research question agrees with [48] study that the different knowledge of inflectional and derivational among their participants was responsible for the difference in performance in the inflectional and derivational tasks. The participants had relatively little trouble with the verb inflection tasks, whereas the derivational morphology task proved to be more difficult. Similarly, a study by [49] showed that derivational words were difficult for their participants. This finding likely reflects learners' lack of familiarity with the meaning of the morphemes attached to the stems in

derivational words. Therefore, they suggested that it might be beneficial to teach the meaning of morphemes and to train them to use morphology to decode word meaning.

The implication of this study is that future research should consider approaching vocabulary by scrutinizing the distinction between morphemes (derivatives and inflections) and words. Future research might focus on the effects in training only a single aspect of morphemic awareness over a longer treatment period to determine its effectiveness on vocabulary development. Also to replicate and establish the results of this study with a larger and more diverse group of ESL learners such as high proficiency secondary school students or at tertiary level to counter all the limitation found in this study such as small number of samples, low proficiency students and limited types of morphology.

In short, these results underscore the importance of morphemic analysis awareness in acquiring vocabulary effectively. The results indicate that inflectional and derivational morphemic analysis awareness is definitely a boon to improve vocabulary among learners with low proficiency in ESL context.

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