

Morphemic Analysis Awareness: Impact on ESL Students' Vocabulary Learning Strategy

Chandrakala Varatharajoo, Adelina Binti Asmawi, Nabeel Abdallah Mohammad Abedalaziz

Abstract—The research explored the effect of morphemic analysis awareness on ESL secondary school students' vocabulary acquisition. The quasi-experimental study was conducted with 100 ESL secondary school students in two experimental groups (inflectional and derivational) and one control group. The students' vocabulary acquisition was assessed through two measures: Morph-Analysis Test and Morph-Vocabulary 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 Morph-Analysis Test and Vocabulary-Morphemic Test. However, the inflectional group obtained a fairly higher score than the derivational group. Thus, the findings of the research are discussed in two main areas. First, individual instructions of two types of morphemic awareness have contributed significant results on inflectional and derivational awareness among the ESL secondary school students. Nevertheless, derivational morphology achieved a significant but relatively smaller amount of effect on secondary school students' morphological awareness compared to inflectional morphology in this research. Second finding showed that the awareness of inflectional and derivational morphology was found significantly related to vocabulary achievement of ESL secondary school students. Nevertheless, inflectional morphemic awareness had higher significant effect on ESL secondary school students' vocabulary acquisition. Despite these findings, the study implies that morphemic analysis awareness can serve as an alternative strategy for ESL secondary school students in acquiring English vocabulary.

Keywords—Morphemic analysis, vocabulary, ESL students.

I. INTRODUCTION

IT is a fact that vocabulary is profoundly important to acquire a language, especially English which is considered to have a large vocabulary repertoire. Vocabulary is essential to acquire not only language skills but also comprehension and communication.

According to [1], language attainment and communication skills are largely affected if students have inadequate vocabulary. Hence, students ought to be exposed with strategies that will develop vocabulary according to their age and proficiency level. This is because to know, to understand, and to use words support language development [2].

As [3] asserts, recently, research in language learning have focused on the importance of vocabulary acquisition because studies point out that the delay in its acquisition hampers

students' language and communication development[4]. According to [5], components of language include sound, grammar, and vocabulary but among these, vocabulary is found to be more influential in language learning. This is because vocabulary is the building blocks of language which is important for both comprehension and fluency [6]. This shows that vocabulary is essentially crucial in learning English language as [7] claims, "without grammar, very little can be conveyed, without vocabulary nothing can be conveyed".

Among numerous studies which have explored the use of vocabulary learning strategies, morphemic analysis or morphology cues is recommended as a strategy to foster the vocabulary acquisition [5]. According to [8], morphemic analysis, a strategy to analyze word parts, is found to be a wise choice to decode words meaning of many morphologically complex words. High school books contain a huge number of complex words and many of them are derivatives [8]. Similarly, [9] claims that secondary school texts contain many complex words and if students have morphemic analysis awareness they are able to understand words efficiently because they have the strategy to decode complex words and arrive at meaning efficiently.

The purpose of this study is to find a practical method that can help ESL students to acquire vocabulary effectively. This study is important because research shows that the existing vocabulary teaching and learning methods are yet to be proven to be the most effective ways to teach vocabulary. It is also worth to mention that students especially low proficiency ones require explicit instruction for effective vocabulary acquisition. As claimed by [10], there is yet a best way to teach vocabulary even though some methods seemed to be proven effective in some situation, so there is still a room for finding the best approach for vocabulary development. Thus, the current study is aimed to examine the effects of morphemic analysis strategy on ESL secondary school students in Malaysia. The study was focused on the impact of inflectional and derivational morphemic awareness on the students' vocabulary development.

Studies which were conducted among secondary and university students in Malaysia showed that vocabulary is a pertinent problem for them [11]-[18]. Researchers such as [19] - [21] found that one main reason for the lack of vocabulary among these students was due to a poor understanding of the linguistic aspect of the language. Linguistically, morphological level (morpheme), the lexical level (word order) and the syntactic level (sentence structure) are main principles in a language [20]. This study looks at the morphological level because morphemes are the basis for

Chandrakala Varatharajoo is with the Faculty of Education, University Malaya, Kuala Lumpur, Malaysia (phone: 603-7967 5000; fax: 03-7967 5506; e-mail: vc5010@yahoo.com).

Adelina Binti Asmawi is with the Faculty of Education, University Malaya, Kuala Lumpur, Malaysia (e-mail: adelina@um.edu.my).

Nabeel Abdallah Mohammad Abedalaziz is with the Faculty of Education, University Malaya, Kuala Lumpur, Malaysia (e-mail: nabilaziz@um.edu.my).

complex words; and students without understanding words they cannot progress into syntactic level or larger texts. When students have morphemic awareness, they will understand how words are formed through a combination of prefixes, suffixes, and roots and their vocabulary range will expand and that will lead to a better text comprehension [22]. In contrast, when students make morphological errors their incompetence in the language will be reflected through their vocabulary [21]. Thus, there is a need of an alternative strategy to rectify this issue so that it would not be a constant concern in vocabulary research in the ESL context [20].

<p>Complete the sentences by adding “dis”, “un”, “ed” or “ing”</p> <ol style="list-style-type: none"> Advantages: Smoking has many _____. Well: My mother was _____ with a bad cold last week. Sleep: The men are _____ because they are exhausted. Paint: My little sister _____ a picture of our parents. Known: There are many _____ hills in the country. Satisfied: The farmers are _____ with the decision.
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Fig. 1 Morph-Analysis Test

<p>Classify the smallest units in words.</p> <ol style="list-style-type: none"> Approving= _____ + _____ + _____ Personally= _____ + _____ + _____ <p>Identify the base word of the word given.</p> <ol style="list-style-type: none"> Skipped After recess, the girls wanted to _____ History class. Musician That lady teaches _____ for young children. <p>Complete the sentence.</p> <ol style="list-style-type: none"> Many people make money in the oil _____. <p>a) industry b) industrialization c) industrialize d) industrious</p> <ol style="list-style-type: none"> The _____ of the lake is at least feet. <p>a) deep b) deepen c) depth d) deeply</p>
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Fig. 2 Morph-Vocabulary Test

In this study, two aspects of morphological knowledge being studied namely, inflection and derivative to examine students' morphemic awareness and vocabulary acquisition. Morph-Analysis Test (adapted from [23]) (Fig. 1) and Morph-Vocabulary Test (adapted from [24], [25]) (Fig. 2) were administered as pretests and posttests in order to get the feedback. Inflectional and derivational awareness of the students were tested in the Morph-Analysis Test because both aspects are important for vocabulary development [26]. Thus, three research questions were raised: 1. What is the effect of inflectional morphemic strategy on students' inflectional morphemic analysis awareness? 2. What is the effect of derivational morphemes strategy on students' derivational morphemic analysis awareness? 3. Is there a significant difference between inflectional morphemic and derivational morphemic strategies on students' vocabulary acquisition? Null hypotheses were: 1. There is no significant effect of inflectional morphemic strategy on students' inflectional morphemic analysis awareness. 2. There is no significant effect of derivational morphemic strategy on students' derivational morphemic analysis awareness. 3. There is no significant difference between inflectional morphemic and

derivational morphemic strategies on students' vocabulary acquisition.

The organization of this paper is as follows: Section II overviews theoretical framework, morphology, morphemic analysis, and vocabulary in literature review. Section III describes the data collection procedure. Section IV reports the analysis and results. Finally, Section V includes conclusion and future recommendations.

II. RELATED WORK

The framework of this research is based on morphemic analysis strategy. Complex words are made of morphemes and morphemes are the smallest linguistic units; thus students can acquire vocabulary from two main ways. First, they can decode word meanings by disassembling complex words into meaningful morphemes [27]. Second, morphemes can also be used to derive the meaning of complex words [26]. This practice is called reflecting and manipulating and they are referred to morphemic analysis. When students are able to identify morphemes such as affixes and base words which carry meanings, they can support students' understanding of morphologically complex words [28].

There is a strong relationship between a person's vocabulary size and their language proficiency because words are the primary carriers of meaning [29], [30]. The relationship between vocabulary and students' proficiency level determines whether certain strategies for teaching and learning vocabulary are worthwhile to be introduced and implemented. Vocabulary learning strategy helps vocabulary to be obtained, stored, retrieved, and used [31]. Therefore, with this understanding, teachers can adopt various strategies for teaching vocabulary. One of the strategies of vocabulary teaching is the use of morphemic cues. Morphemic cues able to aid students to reflect and manipulate the meaning of complex words [32].

Students can use morphemic analysis strategy to decode the meaning of morphologically complex words when they come across them in reading texts [33]. This is because when students apply morphemic analysis strategy they are able to break down morphologically complex words into smallest word parts or morphemes (prefixes, suffixes, and roots) that carry individual meaning to assess meanings [8]. For example, *disappointment* - *dis* + *-appoint* + *-ment* which means *a state of not being happy*. Another instance is the word *buyer* is comprised of two meaningful units, the base morpheme *buy*, and the inclusion of *-er*, which tells what the individual does as implied in the base, thus, the *buyer* is *one who buys*. These complexities will grow deeper and larger when students go into higher grades such as tertiary education. As noted by [33], "It is in the academic arena that students will come across an influx of content specific vocabulary throughout the curriculum." (p. 135). This statement meant that the ability to recognize individual morphemes in morphologically complex words helps students to infer and retain the word meanings not only in language but also across disciplines.

Even though morphologically complex words involve compounding, inflection and derivative words [34], this study

focuses on inflection and derivative words because most complex words in English language are made of them; especially the higher grade texts the more derivatives are found. According to [35], only eight inflectional affixes exist in English language and all of them are suffixes (such as *-s*, *-ed*, *-ing*, *-er*, *-est*). They provide stability to word function and meaning. Inflection indicates grammatical relationship between words in a sentence, e.g., *the boy buys books / boys buy books*. In addition, inflectional awareness is acquired at an early age [36]. On the other hand, derivatives are formed by adding both prefixes and suffixes to base words (e.g., *special-specialty*, *specialization* and *specialist*). In fact derivatives involves with a large number of prefixes and suffixes (e.g., *-dis*, *-im*, *-ly*, *-ment*, *-able*, *-er*, etc.). This process also involves phonological or/and orthographic changes (e.g., *decide-decisive*, *strong-strengthen*) and derivational awareness is an ongoing process where the acquisition continues into adolescent age [37].

Morphemic analysis is strongly proposed [38] as a word analysis strategy in the ESL context so that morphemic awareness among ESL learners can be developed. Students need to be instructed with this particular strategy as they need exposure and training before they could utilize this method at a maximum rate. According to [26], instructional training for morphemic awareness is important because students need to be aware of two types of abilities that they must acquire before they could work on complex words. The first is the analytic aspect (the ability to break down complex words into smaller meanings) and second, the synthetic aspect (the ability to create complex words) which are equally important to decode complex word meanings. Without explicit instruction, it would not be an effective strategy for students because students would not have full grasp on its usage. However, despite knowing the importance of morphemic awareness, relatively few studies have tested it with vocabulary acquisition [5], [26], [38]-[41]. The study of [5] showed students' vocabulary was strongly related to morphological awareness. Morphological knowledge is believed to be an effective strategy in building vocabulary [38]. Similarly, morphological awareness is uniquely associated with vocabulary knowledge and results emphasize the potential importance of different aspects of morphological awareness for vocabulary acquisition [26]. Furthermore, [39] found that students could develop vocabulary better by applying morphological analysis strategy rather than through typical implicit class instruction methods such as contextual clues in the ESL context. On the other hand, [42] revealed no relationship was found between morphological awareness and vocabulary knowledge among the participants and their overall morphological awareness and vocabulary size were inadequate. Another study by [41] showed that students have limited morphemic awareness in both analytic and synthetic aspects. The study, nevertheless, confirmed that the students have better analysis ability than synthesis ability. Thus, based on different views from previous research, this research is another milestone to further confirm whether morphemic awareness can bring a significant effect on vocabulary acquisition. The study also provides an

opportunity to prove that morphemic awareness can be an alternative strategy to improve vocabulary acquisition effectively among secondary school students in Malaysia.

III. DATA COLLECTION PROCESS

This was a quasi-experimental pretest-treatment-posttest design with one control group and two experimental groups done in the Malaysian ESL context. Quasi-experimental research is crucial when the research aim is to examine the effect of a treatment by comparing a treatment group to a comparison group. This is done without a random assignment. This study included non-equivalent groups; and pretests and posttests.

The research was set at a secondary school in urban setting, Malaysia. 100 male and female students from three intact groups of one school were involved in this study. Group 1 (n=33) as the inflectional group; Group 2 (n= 33) as derivational and Group 3 (n= 34) as control group was chosen accordingly.

This study was conducted in three phases to arrive at the findings. Morph-Analysis Test and Morph-Vocabulary Test were administered as a pretest to both control and experimental groups in the first phase. During the second phase intervention was given to three groups for five weeks:

- Group 1 received inflectional analysis instruction.
- Group 2 received derivational analysis instruction.
- Group 3 did not receive any treatment.

The posttest phase was the third phase where Morph-Analysis Test and Morph-Vocabulary Test were administered again to all groups to determine the success of the morphemic analysis instruction on students' vocabulary achievement. The tests were conducted in a predetermined place and no time limit was set. Students were given ample time so that students' fatigue and anxiety would not jeopardize the findings of the study. Fig. 3 shows the procedure of this study.

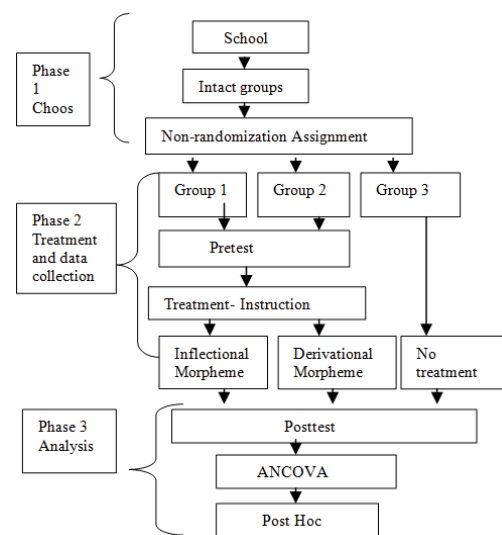


Fig. 3 The research procedure of the study

For the treatment program purposes, target structures were selected based on the three criteria:

1. A list of universal problematic morphological structures was identified from both foreign and local studies in the ESL context.
2. Malaysian secondary school students make universal types of morphological errors and that the patterns of mistakes are rather common.
3. Choice of four language experts from two local universities and secondary schools from the highest frequency affixes by means of a Likert Scale.

Based on the finding above, inflections (-s, -ing) and derivatives (un-, dis-) were chosen. According to [43], a limited and focused structure can deliver an effective outcome in any research.

Lesson plans for each target structure were constructed and delivered based on the English Language Textbook used in the institution. The textbook was deemed suitable as an authentic source for the intervention as it covers all the target structures of the study. Nonetheless, some adaptations were made to suit the aim of this research.

The instructional procedure or analytic instruction (Table I) used in the treatment phase was conducted as recommended 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] as shown below:

1. Preparation: teacher identifies students' prior knowledge about the content and their current use of specific strategies.
2. Presentation: teacher models, names, and explains new strategies.
3. Practice: Students practise new strategies in subsequent practices and teacher encourages independent strategy use.
4. Self-evaluation: students evaluate their own strategy use immediately after practice.
5. Expansion: students transfer the strategy to new tasks.

TABLE I
CONTENT FOR MORPHEMIC ANALYSIS INSTRUCTION

Week	Group	Lesson	Targeted Morpheme	Activities
1-5	1	Inflection	Suffix <i>ing</i> (continuous tense) <i>ed</i> (past tense)	Preparation Presentation Practice
	2	Derivative	Prefix <i>un</i> (not) <i>dis</i> (opposite of)	Evaluation Expansion

The Cronbach's alpha reliability indices were established after a pilot study was conducted. (Table II).

TABLE II
RELIABILITY CRONBACH'S ALPHA OF INSTRUMENTS

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

Both tests showed the alpha indices were more than .70. According to [47], 0.70 or more alpha index shows that a test has high reliability standard and is suitable for classroom tests.

IV. STUDY ANALYSIS AND RESULTS

Analysis of covariance (ANCOVA) and Multiple Comparison (Post Hoc) in SPSS version 22 were employed to analyze the data collected so that the effectiveness of the morphemic analysis awareness over vocabulary acquisition can be determined. 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, $F(1, 67) = 41.24, p = .00, \eta^2 = .389$. The partial Eta squared value of .378 showed that 37.8% 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	41.24	.00	.378
Error	67	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	33	5.25	.25	7.86	.25
Control	33	5.38	1.33	5.36	.26

Table IV shows that students in the experimental group ($M = 5.25, SD = .251$) scored significantly higher than students in the control group ($M = 5.38, SD = 1.33$). Thus, the null hypothesis was rejected. There was a significant effect of inflectional morphemic strategy on students' inflectional morphemic analysis awareness.

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, $F(1, 66) = 10.83, p = .002, \eta^2 = .137$. The partial Eta squared value of .137 showed that 13% of the variance in the dependent variable (derivational morphemic analysis) was explained by the independent variable (group) as shown in Table V.

Table VI shows that students in the experimental group ($M = 7.12, SD = 1.98$) scored significantly higher than students in the control group ($M = 6.15, SD = 1.13$). Thus, the null hypothesis was rejected. There is a significant effect of derivational morphemic strategy on students' derivational morphemic analysis awareness.

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	10.83	.002	.137
Error	66	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	33	7.12	1.98	7.13	.274
Control	34	6.15	1.13	6.14	.274

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	N	Unadjusted		Adjusted	
		M	SD	M	SE
Inflectional	33	22.11	2.01	23.11	.317
Derivational	33	18.57	1.25	19.57	.321
Control	34	12.65	2.31	13.65	.321

Table VII shows that students in the inflectional group (M=22.11, SD=2.01) and derivational group (M=18.57, SD=1.25) scored significantly higher than students in the control group (M=12.65, SD=2.31). 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	-----	3.34	9.15**
Derivational	-----	-----	5.61**

Tables IX and X indicate that students in the inflectional group obtained a significantly higher mean score (M=22.11, SD=2.01) than the students in the derivational group (M=12.65, SD=2.31) on vocabulary acquisition. Thus, the effect of inflectional morphemic strategy was more significant than derivational morphemic strategy on the vocabulary acquisition of ESL secondary school learners in this research. Thus, the proposed null hypothesis was rejected. There is a significant effect of inflectional morphemic strategy was more significant than derivational morphemic strategy on the students' vocabulary acquisition.

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

Group	Means differences	
	Inflectional	Derivational
Inflectional	-----	9.15
Derivational	-----	-----

*p< 0.05

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

Group	Means differences	
	Inflectional	Derivational
Inflectional	-----	-----
Derivational	-----	5.61

*p< 0.05

V. CONCLUSIONS AND FUTURE RESEARCH

The aim of the research was to investigate the effectiveness of morphemic analysis awareness on ESL secondary school students' vocabulary acquisition. The findings of the research are discussed in two main areas. First, individual instructions of two types of morphemic awareness have contributed significant results on inflectional and derivational awareness among the ESL secondary school students. Nevertheless, derivational morphology explained a significant but relatively smaller amount of effect on secondary school students' morphological awareness compared to inflectional morphology in this research.

Second finding showed that the awareness of inflectional and derivational morphology was found significantly related to vocabulary achievement of ESL secondary school students. Nevertheless, inflectional morphemic awareness had higher significant effect on ESL secondary school students' vocabulary acquisition. These findings indicated that ESL secondary school students performed better on inflectional morphemic awareness as compared to derivational morphemic awareness. In addition, that inflectional morphemic awareness had a better contribution on vocabulary acquisition on the ESL students in this study.

The finding of this research question agrees with [48] who found that different rate of inflectional and derivational awareness among their participants contributed to the difference in the inflectional and derivational knowledge. The participants had better inflectional awareness than derivational awareness. Similarly, [49] showed that derivational words were difficult for their participants in their study. This is because the participants were not familiar with the derivational morphemes. Therefore, they suggested instruction in morphemic strategy can be a way to solve students' problem in decoding morphologically complex words.

The study recommends future researchers to consider teaching derivational and inflectional morphemes extensively so that a significant vocabulary development could be seen among ESL secondary school going children. Future research should focus on teaching individual aspects of morphemic awareness over a longer treatment period to determine its effectiveness on vocabulary acquisition. The study also proposes to reproduce this study with a larger and more diverse group of ESL learners such as high proficiency secondary school students or university students. This is important so that all limitations such as small number of samples and limited types of morphology and intervention period can be countered.

To conclude, this study implies that morphemic analysis awareness is an effective vocabulary learning strategy and it definitely can serve as an alternative vocabulary learning strategy for ESL secondary school students in learning English vocabulary.

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Chandrakala Varatharajoo. Currently a PhD student (tesl) in University Malaya, Malaysia. She is an English language teacher in SMK Datok Lokman, Kuala Lumpur. She obtained Masters (tesl) at University Malaya and Degree (tesl) at International Islamic University M'sia. She has authored English Textbook under Malaysian Ministry of Education and Dewan Bahasa & Pustaka; and English workbook under Ilmu Bakti. She won 'Best Paper Award' for her research on morphemic analysis in the International Conference on Teaching and Learning in Chulalongkorn University, Bangkok (Oct, 2015).