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| RESEARCH ARTICLE

Examining the Effect of Word-Formation Instruction on Moroccan EFL Learners' Vocabulary Development

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| ABSTRACT
This study examines the impact of word parts instruction (WPS) on vocabulary development among Moroccan EFL university students at the Higher National School of Mines in Rabat (ENSMR). Specifically, this study aims to (i) measure the students' vocabulary breadth, (ii) to investigate the effect of Word Parts Strategy instruction on L2 vocabulary development. The study involved 58 first-year engineering students at ENSMR, divided equally between an experimental group and a control group (29 students each). Data were collected pre- and post-treatment using the Vocabulary Size Test (VST) and Word Parts Strategy Tests A and B. The pre-tests assessed participants' pre-existing vocabulary knowledge. The posttests were administered to identify the effect of word parts instruction on the students' vocabulary knowledge. The quantitative and qualitative data were statistically analyzed via the Statistical Package for Social Sciences (SPSS. The study found significant differences between the experimental and the control groups'vocabulary learning after the treatment, and the differences were positive in favor of the experimental group. The experimental group demonstrated a statistically significant gain in total vocabulary size following WPS instruction, suggesting that the strategy positively impacted vocabulary learning. The findings reveal that the experimental group not only outperformed the control group but also demonstrated substantial gains in both vocabulary breadth and depth, confirming the pedagogical efficacy of the Word Parts Strategy instruction in university EFL settings.

| KEYWORDS
EFL Learners, Experimental and Control Groups Experimental Design, Vocabulary Size, Word Parts Strategy.

| ARTICLE INFORMATION

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1. Introduction

Since the 1970s, Wilkins (1972) has emphasized the central role of vocabulary in language learning, stating that "without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p. 111). Accordingly, vocabulary can be considered a fundamental component of learning a new language, as learners who lack enough vocabulary breadth often encounter serious difficulties in mastering the target language. Conversely, learners with a larger vocabulary repertoire are more likely to expand their linguistic knowledge and achieve greater proficiency. Consequently, developing an extensive vocabulary remains one of the major challenges in second language acquisition.

Acquiring vocabulary of a foreign language seems to be necessary since words are viewed as "the building blocks of language" (as cited in Vela, 2014, p. 48). Read (2000) states that "Words are the basic building blocks of language, the units of meaning from which larger structures such as sentences, paragraphs and whole texts are formed" (p. 1). It was also argued that "vocabulary is an essential building block of language" (Schmitt, Schmitt & Clapham 2001, p. 55).

Although vocabulary is often viewed merely as an alphabetical list of words in a dictionary, the methods used for selecting and teaching vocabulary play a crucial role in shaping learners' vocabulary size. In this respect, Allen & Valette (1994) state that "vocabulary is one of the important factors in all language teaching; students must continually learn words as they learn structure and as they practice sound system" (p. 149). The statement above sets out clearly the importance of vocabulary while teaching languages. Similarly, Harmer (1991) argues that "If language structures make up the skeleton of language, then it is

vocabulary that provides the vital organs and the flesh" (p .153). Thus, vocabulary takes a central position within language. However, vocabulary is not an end in itself; its role and contribution to language learning should not be neglected. Importantly, vocabulary research emphasizes not only knowledge of individual words but also the overall size and functional use of a learner's lexicon, which is central to effective communication in a foreign language. Accordingly, this study aims to investigate vocabulary size in particular and vocabulary development in general, while examining the effect, if any, of WPS instruction on both.

2. Literature Review

Word parts knowledge is a kind of metalinguistic ability that allows language learners to identify and implement the internal structure of words. Studies investigating the role of word parts instruction among native and L2 speakers have revealed that such knowledge of word formation and their governing rules help learners to develop and improve their vocabulary knowledge (Nagy & Anderson, 1984; McBride-Chang et al., 2003; Shu et al., 2006; Nurhemida et al., 2007; Tabatabaei, 2011; Yahya et al., 2012; Aliasin et al., 2013; Alsalamah et al., 2014; Kraut & Yücel-Koç, 2015; Shoeib & Akbulut, 2016; Alsaeedi, 2017; Rabadi, 2019).

A review of literature on word parts instruction highlights the multifaceted nature of the knowledge acquired through this approach. Even without considering the distinction between vocabulary knowledge and word-parts knowledge, further evidence is required to demonstrate the simultaneous development of morphological awareness and vocabulary growth.Although considerable progress has been made towards understanding morphological development of L2 learners, much remains unknown. A review of empirical literature does in fact suggest that word parts knowledge plays a prominent role in vocabulary development as well. Specifically, there is limited experimental evidence examining how explicit word-parts instruction impacts measurable vocabulary growth among university-level EFL learners. Accordingly, word parts teaching can include explicit instruction in morphological relationships, instruction through word parts that might influence knowledge of morphology, as well as exposure to morphologically complex forms through reading.

Numerous studies have highlighted that learners can acquire a substantial vocabulary, yet still encounter difficulties in deploying these words accurately and appropriately within specific linguistic or communicative contexts. Nation (2001) asserts that the vocabulary breadth entails knowledge of word form either spoken or written, whereas vocabulary depth implies knowledge of word parts, the inflection and derivations that allow new words to be created, etc. It is noticed in this regard that the more words a learner knows, the easier it is to recognize and use them. Empirical research has demonstrated that vocabulary breadth and depth are closely interconnected. Learners with extensive vocabularies often show stronger knowledge of word meanings, forms, and usage patterns, suggesting that strategies aimed at enhancing morphological awareness can simultaneously foster both vocabulary breadth and depth (Harraqi, 2017).

Research on depth of vocabulary knowledge and reading comprehension suggests that in order for learners to fully understand and use less frequent words effectively, they need more than a basic or superficial awareness of their meanings.Nation (2006) considers that EFL learners require knowledge of around 8000-9000 word families for mastering reading and 6000 to 7000 for listening. Without this knowledge, learners might encounter some problems while dealing with a foreign or any other language they are exposed to. While typical language learners would not be able to learn all words that exist in the dictionary, the vocabulary breadth of a native speaker is "around 20,000 word families" (Nation, 2006, p. 12). However there are obvious differences among individuals, this estimate could be generally accepted. Other present-day studies have also confirmed similar results.

One of the most effective strategies for vocabulary development is word decoding, also known as the word-formation or word-building strategy, which helps learners understand new words by analyzing their structure.Bauer et al. (1983) define word formation strategy "as a set of processes for the creation of new words on the basis of existing ones." Thus, by disregarding the process of borrowing from other languages, the vocabulary stock of a language is formed by means of what is usually known as word-formation rules and, particularly, of word-formation mechanisms, such as derivation, compounding, clipping, blending, conversion, abbreviation, etc. (see Adams, 1973; Bauer, 1983 cited in Balteiro, 2011).

One of the Word Parts Strategy's main functions is to derive one part of speech from another. For instance, *organize* is a verb, just like most words that end in *-ize*, whereas words ending in *-ion* or *-tion* tend to function as nouns (e.g. *organization*). Another function of word formation strategy is to change the lexical meaning of the same part of speech. This process is naturally acquired by native speakers. However, this knowledge is not acquired naturally by non–natives for two reasons: firstly because of the 'artificial' nature of the teaching and learning environment, and secondly because of 'the (natural or expected) quantitative difference in exposure to the language" (Bauer, 1983). This strategy can be very beneficial for students as it ensures effective learning autonomy and vocabulary development. As such, "knowing some common prefixes and suffixes (affixes), base words, and root words can help students learn the meanings of many new words" Armbruster et al. (2001). This strategy is also known in literature as morphological or affixation awareness.

As far as the role of word parts in vocabulary building is concerned, the study of suffixes and prefixes is tremendously useful in increasing one's vocabulary in English. Thus, very often, when EFL learners know the base of a new word and have some familiarity with the suffixes and prefixes, they can understand its meaning without having to look it up in the dictionary. Anderson-Inman, 1980; Bauer and Nation, 1993 confirm the value of affixes' knowledge for a learner of English. It can "help the learning of unfamiliar words by relating these words to known words or known prefixes and suffixes, and it can be used as a way of checking whether an unfamiliar word has been successfully guessed from context." (Nation, 2001:264). The use of word parts as a means of acquiring and retaining new vocabulary constitutes a crucial learning strategy and therefore warrants substantial emphasis in both second-language instruction and learner development.

L2 morphological research in education seems to neglect "word-part" instruction. In the last decade, however, morphology has gained an increasing attention in the context of understanding vocabulary growth which occurs during the school years ; For example, "after learning the meaning of *to predict*, a person may be able to formulate the meanings of *prediction*, *predictable*, and perhaps *unpredictable*, not to mention *predicted*, *predicting*, *predicts*, and *predictions*" (Jenkins & Dixon, 1983,p.239). If students are able to utilize morphological information in this way they would have a "powerful generative tool for expanding vocabulary" (Winsock & Jenkins, 1987, p.69). On that basis, the purpose of the present study is further on the effect of word part instruction on L2 vocabulary development.

Recent studies on vocabulary have shown that vocabulary development goes beyond just accumulating more words. It also involves an understanding of more sophisticated relationships between words, as well as how they are used in different contexts. Studies that come after Nation (2006) continue to demonstrate that vocabulary size is important, but also beg the question of how important vocabulary depth is, including but not limited to, the importance of knowledge of vocabulary in morphology and semantics. Schmitt (2014) identifies the various areas involved in knowledge of vocabulary that are important. These include vocabulary described as multidimensional, going beyond recognition of individual words to include the form, meaning, and use of the word as well as the relationships between the different parts of the word and its use. Webb and Nation (2017) state that advanced proficiency in a subject requires both the breadth and depth of vocabulary. This is especially true in academic settings that use a lot of words that are morphologically complex.

Increasing evidence is showing that word formation knowledge is important for vocabulary development for EFL students. Goodwin and Ahn (2013) report that students vocabulary knowledge and reading comprehension increases after being taught explicit morphologies. Zhang and Koda (2018) show that a students vocabulary and ability to make inferences from a text increases if they have the ability to analyze the various roots and affixes in a word. Word-part strategies increase learner autonomy in that they help students read and comprehend unfamiliar academic vocabulary (Teng, 2020; Sukying, 2020). Moreover, these strategies empower learners to independently decode and internalize complex vocabulary, fostering long-term retention and self-directed learning. In the Moroccan EFL context, Harraqi (2019) reported that Word Part Strategy Instruction significantly improved university students' word knowledge and their ability to infer meanings of morphologically complex vocabulary. More recently, Harraqi (2026) further confirmed that explicit morphological awareness instruction contributes substantially to learners' vocabulary development, reinforcing the pedagogical value of integrating morphology-based approaches into EFL vocabulary teaching. These findings support the argument that vocabulary instruction should move beyond memorization and incorporate morphological analysis as a powerful tool for long-term lexical growth.

3. Methodology

This research does not aim to go deeply into the theoretical debates that surround morphological features in the literature. Rather, it takes a more straightforward and practical approach by presenting the main ideas related to word formation in a clear and accessible way. This study bridges the gap between theoretical understanding of morphology and practical EFL teaching, providing evidence for effective instructional design.

Although previous studies have established a relationship between word parts instructions and vocabulary development, limited experimental research in EFL university contexts has examined the direct impact of explicit word-formation instruction on vocabulary breadth using standardized frequency-band measures. The study is mainly concerned with understanding how teaching word parts—such as prefixes, suffixes, and roots—can contribute to vocabulary learning in an English as a Foreign Language (EFL) setting. In particular, it seeks to clarify whether explicit instruction in these elements can help learners expand their vocabulary knowledge and become more capable of working out the meanings of unfamiliar words. In fact, this study extends previous research by providing experimental evidence that explicit morphological instruction not only enhances learners' ability to decode complex lexical forms but also significantly increases overall vocabulary breadth, as measured through standardized frequency-band testing.

3.1 Research Questions

This study seeks to answer the following research questions:

1. What is the English vocabulary breadth of the participants before and after the treatment?
2. What is the effect of WPS instruction on vocabulary development?

3.2. Participants

The study involved 58 first-year university students, aged 19–22, enrolled at the Higher National School of Mines in Rabat (ENSMR), an engineering institution. All participants were engineering students and were drawn from two existing English classes. The sampling strategy was non-random convenience sampling, and the study used a quasi-experimental design with two intact, non-randomized groups: an experimental group and a control group, each comprising 29 students. The participants had received at least six years of formal English instruction before data collection. Both groups followed the same English course and materials; however, the experimental group received explicit Word Parts Strategy instruction during the 12-week intervention, while the control group continued with traditional vocabulary instruction.

3.3. Research Instrument

Vocabulary Size Test (VST)

The Vocabulary Size Test (VST), established by Paul Nation and David Beglar (2007), is a standardized multiple-choice tool designed to measure the written receptive vocabulary of both native and non-native English speakers. It includes 140 items, each presenting a target word alongside a sample sentence that demonstrates its use in a neutral context. The test is organized into 14 sets of 10 items, with each set corresponding to a 1,000-word frequency band, based on Nation's fourteen 1,000-word British National Corpus (BNC) word lists.The assessment focuses on word families, taking into account learners' knowledge of word components and their ability to recognize derivational and inflectional forms. According to Nation and Webb (2011), learners at levels beyond the beginner stage are expected to possess some capacity to infer the meanings of unknown words based on their understanding of word structures.

Word Parts Pre-Posttests (A and B)

Two vocabulary tests were given before and after the instruction (**see the examples 1and 2 below**). Test A consisted of twenty unfamiliar words, with the meanings of their roots provided. Participants were asked to rely on their knowledge of word formation and affixation rules to infer the meanings of these words in English. The purpose was to examine whether they could use the meanings of individual word parts to construct accurate definitions. After completing and submitting Test A, the participants were given Test B during the following session. The same twenty target words were included in both tests. In Test B, students were required to match each word with its correct meaning by selecting from forty possible options, which were organized into four groups of ten choices each. Similarly, the total score of test B is 20 points which represents the possible correct answers. The use of a pre-test/post-test control group design strengthens the internal validity of the study by allowing for direct comparison between instructed and non-instructed groups.

Use your knowledge of word formation and affixes to complete the meaning of the following words. The meaning of the root word is given.

1. **Conceive** – to form an idea, plan, or notion.
   Pre-conceive: _____
2. **Regulate** – to control or maintain the rate or function of something.
   Over-regulate: _____
3. **Energize** – to give energy or vitality.
   De-energize: _____

Test A: Target Affixes

In addition to the general introduction of word building and combination by giving examples, the instruction focused on ten specific affixes selected from Levels 4 to 7 of Bauer and Nation's (1993) affix classification. These included five prefixes and five suffixes, chosen mainly on the basis of their frequency of occurrence and the degree to which affixation affects the written or spoken form of the root. Bauer and Nation (1993) organized derivational affixes into seven graded levels according to their relative ease of acquisition, in order to support systematic teaching and learning. Following this framework, the affixes examined in the present study were drawn from stages 4 through 7.

"Five prefixes and five suffixes were selected based on their regularity—how much affixation changes the root—and frequency of occurrence, including: -ation, -ize, -ous, -ance, -ant, -in, anti-, sub-, re-, and de (Xinjie, 2011, p.2)." In some cases, learners were required to apply their morphological knowledge and make appropriate adjustments when attaching affixes, particularly when affixation resulted in changes in word class or meaning. All of the affixes selected for this study were derivational in nature. Except for the high-frequency prefixes *re-* and *de-*, classified within Levels 6 and 7 of Bauer and Nation's (1993) affix hierarchy, the remaining eight affixes consisted of standard forms selected from Levels 4 and 5. Overall, the affixes were selected in accordance with the established difficulty order of L2 English affixes proposed by Bauer and Nation (1993) and further discussed by Nation (2001).

Test B: Target Words (TWs)

As noted earlier, students were asked to match the meanings of 20 target words with the correct definitions selected from a total of 40 options. These choices were organized into four groups, with ten items in each group. Care was taken to maintain a balanced distribution of nouns, verbs, and adjectives across the groups. In addition, words that were likely to be confusing or closely related in meaning were placed within the same group to increase the level of challenge. The main purpose of these two tests was to examine whether learners could successfully apply the word part strategy and their knowledge of affixes to infer the meanings of unfamiliar words, as well as to assess the extent to which this strategy supports vocabulary development. The items of the test were taken from Xinjie (2011), who adopted Bauer and Nation's (1990) list of affixes following its difficulty level orders : (**See Ex.2 below**).

As mentioned earlier, the researcher selected low-frequency, advanced English words, as these are likely to be unfamiliar to the students. The target set included twenty words, with each pair sharing the same affix, allowing the researcher to see whether the word-part strategy helps students work out new words and supports vocabulary learning. To ensure the words were truly unknown, a pre-test was given one week before the treatment sessions, following Hulstijn (2003). The selection of target words was also guided by the difficulty order of L2 English affixes (Bauer & Nation, 1993; Nation, 2001).

Test B. Ex 2

Group III

1 sub-discipline
2 duplicitous
3 exuberance _____the action of keeping careful watch for possible danger or difficulties
4 regulate _____being deceitful, dishonest
5 subaudition _____assign or distribute (something) again or in a different way
6 regatta ____a field of specialized study within a broader branch of knowledge
7 reapportion _____rejection of a proposal or idea
8 capricious
9 vigilance
10 repudiation

3.4. Statistical Analysis

Quantitative data from the VST and Word Parts Tests A and B were analyzed using SPSS (version 22). SPSS was selected because it has the ability to analyze large data sets and perform both descriptive and inferential statistical analyses, as well as the ability to accurately determine the presence and size of differences between groups. Means, standard deviations, and minimum, maximum pre and post test scores for the experimental and control groups were calculated to provide detail about participant's scores. These statistics showed how learner's vocabulary knowledge and word-part strategy were distributed, and indicated how much they centered and how much they varied. To determine whether statistically significant differences existed between the experimental and control groups, independent-samples *t*-tests were performed on both the pre-test and post-test results. This procedure enabled the comparison of group mean scores in order to assess the impact of Word Parts Strategy instruction on

vocabulary development. In addition, paired-samples *t*-tests were conducted within each group to examine changes from pre- to post-testing, thereby providing insight into the extent of vocabulary gains achieved over the duration of the intervention.

4. Data Analysis

A. Vocabulary Size Test Before WPS treatment

The Vocabulary Size Test was administered to two groups of seventy five students. The test consisted of 14 levels; each level comprised 10 items. The test was meant to test the most occurring 14000 words in English. Each row of 10 items represents 1000 most frequent words making Nation's 14000 word families. The frequency levels are arranged in order from the most common band to the least common. Each correct answer was given 1 (one point) score making the total possible score 140 points. A student's overall score is determined by calculating the learner's overall test result and then scaling it by 100 to estimate vocabulary size in word families.

To address the first research question concerning participants' overall vocabulary size before and after the treatment, the total mean scores across the 14 levels were calculated for both groups. As reported in Table 1, the experimental group's mean vocabulary size before treatment was 4,220.68 word families, while the control group's mean was 4,489.68 word families. These table-based figures indicate that the control group began with a somewhat higher estimated vocabulary size. The interpretation of the pre-treatment comparison should nevertheless be considered alongside the numerical inconsistencies identified in the descriptive and inferential statistics, which are disclosed in the accompanying correction letter.

Table 1 provides the descriptive statistics for the mean scores of students on the Vocabulary Size Test (VST) at each level prior and after to the treatment.

Table 1. VST Scores by Level Before and After Treatment (N = 58)

Levels	Exp Mean (Before)	Exp Mean (After)	Exp Gain	Ctrl Mean (Before)	Ctrl Mean (After)	Ctrl Gain
1000 WL	606.90	868.97	+262.07	627.59	682.76	+55.17
2000 WL	462.07	813.79	+351.72	444.83	486.21	+41.38
3000 WL	437.93	648.28	+210.35	444.83	493.10	+48.27
4000 WL	400.00	689.66	+289.66	403.45	486.21	+82.76
5000 WL	406.90	634.48	+227.58	417.24	458.62	+41.38
6000 WL	334.48	582.76	+248.28	372.41	365.52	-6.89
7000 WL	310.34	482.76	+172.42	289.66	324.14	+34.48
8000 WL	327.59	479.31	+151.72	324.14	331.03	+6.89
9000 WL	234.48	344.83	+110.35	286.21	265.52	-20.69
10000 WL	131.03	279.31	+148.28	189.66	179.31	-10.35
11000 WL	186.21	286.21	+100.00	244.83	172.41	-72.42
12000 WL	141.83	258.62	+116.79	186.21	162.07	-24.14
13000 WL	134.48	217.24	+82.76	144.83	137.93	-6.90
14000 WL	106.90	203.45	+96.55	113.79	103.45	-10.34
Total Mean	4220.68	**6789.67**	+2568.99	4489.68	4648.28	+158.60

Table1 demonstrates that the intervention group attained significantly higher scores in comparison to the control group. Specifically, the overall vocabulary size for the post-test experimental group is estimated at 6,789.67 word families, whereas the control group scored 4,648.28 word families. As for the scores of each level, the experimental group achieved higher scores across Levels 1–6, while the control group performed well in Level 1 but moderately in Levels 2–5. In this regard, the experimental group`s highest mean scores for the first six levels were 868, 813, 648, 689,634, and 582. However, the control group gained high scores in the first level 882, but the scores of the other subsequent levels (level 2 – level 5: 486,493,486,458) were relatively below 500 word families.

In this context, it was found that the treatment group achieved moderate scores in the sixth, seventh, and eighth levels (M= 582, 482, 479), while the scores of the control group were lower (M= 365, 324, 331). As for the remaining levels (level 9 – level

14), the treatment and control groups' correct answers were under 50% items included in these bands, but the results of the intervention group were slightly greater than the control scores. The students` mean scores ranged from (M= 344 to 203) for the experimental group and (M= 265 to 113) for the control group. This difference was also proved by testing the statistical significance of the t-test result: Sig. = 0.325, which is larger than the cut- off of .05. Regarding the significance value of the variance (Sig = 0.325 > 0.05), the null hypothesis of homogeneity of means was retained, whereas the alternative hypothesis, which posits a difference between the two means, was rejected. These results suggest that, prior to the intervention, there was no statistically meaningful difference between the average scores of the experimental and control groups.

Regarding the post-test, the independent samples t-test reveals a considerable difference between the average scores of the experimental and non-treatment groups. An independent-samples t-test indicated a significant difference between groups, $t(56) = 12.74$, $p < .001$. These results suggest that the mean vocabulary size scores of the experimental group, who received WPS instruction, are significantly higher compared to those of the control group. The detailed results of the independent samples t-test, comparing vocabulary sizes before and after the word parts treatment, are presented below.

As indicated, the experimental group demonstrated an average increase of 2,568 words in their vocabulary scores following instruction.Conversely, the average scores of the control group have increased only by **158.60** word families. This confirms again how the treatment group outperformed the control group. These findings reveal the positive impact of the word part instruction on the treatment group students, while the difference in the control group scores likely reflects the natural progression from standard vocabulary instruction over 12 weeks

To sum up, the significant statistical differences between the experimental and the control groups' mean scores show clearly the effect of the treatment on the group which received the WPS instruction, wherein the control group scores remain nearly the same with a slight difference from the pre and posttest mean scores. Conversely, the mean scores of both groups declined from the first seven levels to the subsequent seven levels, likely reflecting the participants' greater familiarity with high-frequency words compared to less frequent ones. This remarkable increase in word families in the experimental group highlights the substantial practical impact of Word Parts Strategy instruction. It demonstrates the strategy's potential to accelerate vocabulary acquisition far beyond typical classroom instruction.

Question two investigates the effect of word part strategy instruction on students' vocabulary development. In this context, two vocabulary tests based on word parts instruction were given before and after the instruction (**see table 2** and **3**). In short, Test A included twenty unfamiliar words, with the meanings of their roots provided to the students. They were asked to use their understanding of affixes and word-formation rules to figure out each word's meaning, essentially seeing if they could piece together the whole from its parts. The same twenty words were then used in Test B, where students had to match each word with its correct meaning from a set of forty options, divided into four groups of ten. This setup allowed the researcher to explore how effectively students could apply word-part knowledge to understand new vocabulary.

Table 2. Descriptive statistics for the pre-test results (N = 58)

	Group	N	Tests	Mean	SD	Min	Max
Pre-Test	**Experimental**	29	A	7.89	2.04	3.00	12.00
			B	8.69	1.7	5.00	13.00
	Control	29	A	7.496	1.99	4.00	20.00
			B	8.13	2.11	4.00	20.00

The descriptive statistics presented in Table 2 indicate only a slight difference between the total scores of the treatment and control groups in the pre-test. To validate this observation statistically, independent-samples t-tests were subsequently conducted, as shown in the tables below.

Table 3. Independent Samples t-Test Results for Pre-Test A and Pre-Test B

Test	Variance Assumption	Levene's F	Sig. (F)	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
Pre-Test A	Equal variances assumed	0.002	0.969	−0.130	56	0.897	−0.06897	0.52949	−1.12967	0.99174
	Equal variances not assumed	—	—	−0.130	55.965	0.897	−0.06897	0.52949	−1.12968	0.99175
Pre-Test B	Equal variances assumed	1.080	0.303	1.641	56	0.106	0.82759	0.50419	−0.18242	1.83759
	Equal variances not assumed	—	—	1.641	53.515	0.106	0.82759			

Regarding Test A, Table 3 indicates that the significance level for Levene's test is 0.897, exceeding the conventional alpha level of 0.05. Likewise, for Test B, the significance level is 0.106, also greater than 0.05, confirming that the assumption of homogeneity of variances is satisfied. Accordingly, the statistics reported in the first row of Table 3 were used for interpretation. The independent-samples t-test results for both Test A and Test B reveal that there were no statistically significant differences between the experimental and control groups prior to the implementation of the intervention.

Posttest results A and B

It is worth indicating that after 12 weeks of word parts treatment, the same vocabulary test used as a pre-test was administered again to the groups as a post-test. Seeking to measure the difference between the groups in terms of their vocabulary development, the students' scores on the posttest A and B were analyzed and compared applying descriptive statistics, the normality test, and the independent samples t-test. The results are displayed in tables **4** and 5.

Table 4 . Descriptive statistics for the posttest A results.

	Group	N	Tests	Mean	SD	Min	Max
Post-Test	**Experimental**	29	A	16.37	2.396	9.00	20.00
			B	16.41	2.784	5.00	6.00
	Control	29	A	8.82	2.139	5.00	13.00
			B	9.13	2.531	11.00	20.00

A closer look at the table below shows that the treatment group achieved noticeably higher scores in Test A after receiving instruction in the Word Parts Strategy (M = 16.37, SD = 2.396) compared with the control group (M = 8.82, SD = 2.139). This result suggests that the experimental group clearly performed better than the control group on this measure. Table 4 further illustrates that the difference between the two groups' post-test mean scores is substantial, pointing to a meaningful effect of the instructional intervention. A similar comparison of mean scores was also carried out for Post-test B.

The results of Test B indicate that the treatment group achieved a notably higher mean score in vocabulary development following instruction in the Word Parts Strategy (M = 16.41, SD = 2.784) compared to the control group (M = 9.13, SD = 2.531). This finding points to a considerable difference in post-test performance between the experimental and control groups. To formally assess the statistical significance of this difference, independent-samples *t*-tests were conducted. Prior to these analyses, the normality of the score distributions for both Test A and Test B was evaluated to ensure the appropriateness of the parametric tests.

Table 5. Independent Samples t-Test Results for Post-Test A and Post-Test B

Test	Variance Assumption	Levene's F	Sig. (F)	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
Posttest A	Equal variances assumed	0.349	0.557	12.659	56	< .001	7.551	0.596	6.356	8.746
	Equal variances not assumed	—	—	12.659	55.292	< .001	7.551	0.596	6.356	8.746
Posttest B	Equal variances assumed	0.282	0.598	12.743	56	< .001	8.275	0.649	6.974	9.576
	Equal variances not assumed	—	—	12.743	55.263	< .001	8.275			

Comparison of Pre-Posttest results in A and B

To have a better view of the results, pre- and posttest mean scores, standard deviations and significance level of the experimental and control groups are grouped in table **6**.

Table 6 presents the descriptive statistics for pre-and post-test results of the experimental and control groups Tests A and B.

Table 6. Pre- and post-test results of the experimental and control groups Tests A and B

Groups	Tests		Pretest			Posttest	
	A	**Mean**	**SD**	**Sig.**	**Mean**	**SD**	**Sig.**
Experimental		7.89	2.041	**.897**	16.37	2.396	< .001
Control	A	7.96	1.99	**.897**	8.82	2.139	< .001
Experimental	B	8.96	1.7	.106	16.41	2.784	< .001
Control	B	8.13	2.116	.106	9.13	2.531	< .001

Overall, descriptive statistics, alongside independent-samples t-tests, were employed to compare vocabulary performance between the treatment group (receiving Word Parts Strategy instruction) and the control group (receiving traditional vocabulary instruction).There was a significant difference in the mean scores for the treatment group in pre-posttest A who increased from 7.89 to 16.37, and from 8,96 to 16, 41 pre-posttests B. On the other hand, the results indicate no significant difference in the control group who shifted from 7, 96 to 8.82 in pre-posttests A, and from 8, 13 to 9,13 pre-posttests test B. This slight difference

in the control group was proved to be non-significant by means of the t-test stated above. Interestingly, these results suggest that word parts instruction does really have an effect on vocabulary development.

5. Discussion and Implications

The current study seeks to examine the impact of word parts instruction on vocabulary development among Moroccan EFL learners. To investigate this effect, three research questions were formulated. The discussion of the findings related to these questions can be found in the subsequent parts.

Vocabulary size before and after the treatment

Research question one explores the vocabulary size of the students before and after receiving the word parts instruction. The question reads as follows:

The primary research question of this study investigated the English vocabulary size of Moroccan EFL learners at the Higher National School of Mines in Rabat (ENSMR). To measure the students' total English vocabulary breadth before and after the intervention, the Vocabulary Size Test (VST) was utilized. This test encompassed 14 frequency levels, with each level designed to evaluate the 1,000 most commonly used words in English.

The Vocabulary Size Test results reported in Table 1 show a pre-treatment mean vocabulary size of 4,220.68 word families for the experimental group and 4,489.68 word families for the control group. These values are reproduced from the table in the doctoral dissertation. The difference between the groups at baseline should be interpreted cautiously because other descriptive figures reported in the dissertation are not fully consistent.

Regarding the post-test, the total mean vocabulary size of the experimental group was estimated at (M = 6,789.67) word families. In contrast, the total mean score for the control group was (M = 4,648.28) word families. In this study, students in the experimental group fell within the range of upper-intermediate EFL university students concerning vocabulary size, while the control group was classified as intermediate EFL university students (Nation, 2009).

The findings also indicated that the scores of the experimental group increased by an average score of 2300 words after instruction. One probable explanation is that the instruction sessions show that WPS instruction has positively influenced vocabulary size of the experimental group; this finding lends support to various studies. By contrast, the average scores of the control group have increased only by 427.58 word families. These findings clearly indicate the impact of the word parts instruction on the treatment group, while the small change in the control group scores is probably natural since they received 12 weeks of a traditional vocabulary instruction

Consistent with existing literature, Zhang (2002) found that L2 Chinese learners who underwent focused morphological instruction through word parts analysis (N = 32) achieved significantly better results on a vocabulary test measuring adjectival lexical knowledge compared to the members of the control group (N = 33).

Addressing the study's second research question, which focused on investigating the impact of the Word Part Strategy (WPS) on vocabulary size before and after the intervention, the current study indicated notable differences in the average scores of the experimental group's vocabulary size before and after the treatment. Conversely, no significant difference was observed in the mean vocabulary size scores of the non-treatment group between the pre-test and post-test. Consequently, the treatment group demonstrated a statistically significant growth in vocabulary size relative to the non-treatment group after the treatment. Similarly, Stahl, Kuhn, and Nagy (1991) and Feldman and Kinsella (2003) suggested that English language learners should be able to analyze newly encountered words by breaking them down into meaningful components (prefixes, roots, suffixes) and then constructing words through morphological awareness to effectively enhance their vocabulary size.

Therefore, the results of Test A are sufficiently conclusive to demonstrate that knowing a word necessarily involves knowing the members of its word family (Bauer & Nation, 1993; Nation, 2001). These outcomes also corroborate the findings of previous studies. Bauer and Nation (1993), Nation and Waring (1997), and Nation (2001), for example,, for example report that, using knowledge of affixes to learn vocabulary is a useful and commonly utilized strategy to facilitate vocabulary acquisition. To illustrate, previous studies related to affix knowledge and vocabulary development conducted by (Schmitt, 1997; Nation, 2001 cited in Xinjie, 2011: 35) suggest the efficiency of word part instruction in facilitating vocabulary learning and understanding the meaning of unfamiliar words.

Altogether, the findings indicate a significant difference among the experimental group results after the word part strategy instruction. In this respect, the treatment group outperformed the control one in both tests of vocabulary development. The slight difference shown by the control group students proved to be non-significant by means of the t-test. In sum, these results suggest that word part instruction does really have an effect on students' vocabulary knowledge to understand the meaning of unfamiliar words and facilitates L2 vocabulary learning.

6. Limitations of the Study

This study has several limitations. First, it involved 58 first-year engineering students from one institution, the Higher National School of Mines in Rabat (ENSMR), and used convenience sampling with two intact, non-randomized classes. The findings should therefore not be generalized uncritically to students from other institutions, disciplines, age groups, or educational contexts. Second, the intervention lasted 12 weeks, and a longer follow-up would be needed to establish whether any vocabulary gains were maintained over time. Third, the study focused on receptive vocabulary performance and did not examine learners' productive vocabulary in speaking or writing. Further research involving larger and more diverse samples, delayed post-tests, and productive vocabulary measures would help clarify the wider and longer-term effects of Word Parts Strategy instruction.
Despite these limitations, the findings of this study provide significant evidence that explicit word parts instruction can greatly improve EFL learners' vocabulary knowledge. The findings of this study underscore the significance of integrating word formation knowledge in vocabulary instruction and point to promising avenues for future studies, such as investigating long-term outcomes, investigating productive vocabulary use, and validating the approach with more varied populations. The findings of this study support theoretical frameworks that consider morphological knowledge as a key element of lexical development, suggesting that explicit word structure attention can facilitate vocabulary development rather than simple memorization.

7. Conclusion

The major concern of this study was to explore the effectiveness of direct instruction on second language vocabulary development of EFL students via word part vocabulary learning strategy. The study investigated the effect of word parts instruction on vocabulary size and vocabulary development of Moroccan EFL undergraduate students. Therefore, this study is a tentative contribution in the field of applied and educational linguistics which may push future research to reconsider the relationship that may link word part strategy, vocabulary size and vocabulary development. Indeed, this piece of work is a foundation for further investigation about other vocabulary learning strategies.

These findings have implications for teaching and learning as well. In simplest terms, raising teachers' and researchers' consciousness about the importance of the link between word parts instruction and vocabulary development is one of the main pedagogical implications. This piece of research proposes that the students should be equipped with a balanced lexical and morphological awareness, through developing their vocabulary knowledge through word part strategy instruction. Therefore, the current study provides language teachers with effective ways to help students improve their vocabulary knowledge through adopting word part strategy to unlock the meanings of newly encountered words, hence Word Parts Strategy can be one of these strategies.

In order to make the vocabulary learning more successful, word parts instruction can be communicated to EFL syllabus and textbook designers as it has a positive effect on vocabulary teaching and learning. Explicit instruction of word parts may be an efficient way to enhance Lexical knowledge by giving students the sense of words, clear access to related words and explicit awareness of how words can be related. With this in mind, vocabulary components will be incorporated in teaching-learning materials taking into account a systematic - rather than a random - morphological and lexical interaction (McBride-Chang et al. 2005; Morin, 2003). Nation (2001) believes that textbooks designed with formal vocabulary control may be of much help for students to boost their vocabulary repertoire and therefore could be included in the curriculum. The results underscore the pedagogical value of incorporating systematic word-formation instruction into university-level EFL curricula to accelerate vocabulary development.

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