



THE IMPACT OF EXPERIENTIAL LEARNING ON EFL UNIVERSITY STUDENTS' DERIVATIONAL KNOWLEDGE: A QUASI-EXPERIMENTAL STUDY

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Abstract:

This study investigates the effect of experiential learning (EL) on the derivational knowledge development of English as a Foreign Language (EFL) university students within reading comprehension classes. Drawing on Kolb's experiential cycle, this study examines whether experiential learning activities, characterized by hands-on engagement and real-world application, lead to greater gains in receptive and productive derivational knowledge compared to conventional explicit instruction. To conduct this study, a quasi-experimental design was employed involving 80 first-year Moroccan university students from L'École Supérieure de l'Éducation et de la Formation (L'ESEF), Ibn Tofail University. The participants were evenly divided into experimental and control groups. Both groups received eight weeks of instruction focusing on common English derivational morphemes. Data collection included a proficiency placement test, pre-test, post-test, and delayed post-test. Quantitative analysis revealed statistically significant gains in both receptive and productive vocabulary knowledge among the experimental group, with improvements maintained over time. For instance, scores in receptive derivational knowledge increased from a pre-test mean of 5.17 to 13.32 in the delayed post-test ($p < .001$). Conversely, the control group showed no significant improvement.

Keywords: experiential learning, receptive derivational knowledge, productive derivational knowledge, EFL students, quasi-experimental design

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1. Introduction

The acquisition of derivational morphology represents a significant challenge for EFL learners, yet it is essential for academic language proficiency (Nation, 2013). Research suggests that students often struggle to apply morphological knowledge in authentic communicative contexts (Carlisle, 2010), especially when teaching derivational morphology typically involves explicit instruction of affix meanings, memorization of word families, and decontextualized exercises. Although these methods can produce measurable short-term gains, they frequently fail to equip students with the deeper, more intuitive grasp of word architecture needed for spontaneous application. Perhaps, then, the solution lies in flipping the paradigm: instead of learning rules first and applying them later, students might better acquire this knowledge by encountering morphological principles not as static facts, but as living tools, and keys for unlocking meaning within the engaging reality of real-world texts.

Experiential learning theory, as articulated by Kolb (1984), posits that learning occurs through a cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Unlike passive reception of information, experiential learning engages learners in direct encounter with phenomena, followed by structured reflection that leads to concept formation and application.

In the context of language learning, experiential approaches emphasize learning from experience. That said, engaging learners in communicative tasks, problem-solving activities, and real-world language use (Knutson, 2003). For derivational morphology, experiential learning might involve activities such as word-formation games, corpus-based discovery tasks, creative writing with morphological constraints, and analysis of authentic texts.

1.2 Statement of the Problem

Despite theoretical support for experiential learning in language education, empirical research examining its effectiveness for teaching specific linguistic subsystems, particularly derivational morphology, remains limited. Most studies of morphological instruction have focused on explicit teaching methods or have been conducted with native English-speaking children rather than EFL university students (Goodwin & Ahn, 2013). Consequently, EFL educators lack evidence-based guidance for designing instruction that promotes deep, transferable derivational knowledge.

1.3 Purpose and Research Questions

This study aims to investigate the effectiveness of experiential learning for developing derivational knowledge among EFL university students. Specifically, the study addresses the following research questions:

Q1: Is there a significant difference in derivational knowledge gains between EFL students who receive experiential learning instruction and those who receive traditional explicit instruction?

Q2: To what extent does experiential learning affect students' ability to recognize, analyze, and produce derived word forms?

Q3: Do students in the experiential learning group demonstrate better retention and transfer of derivational knowledge compared to the control group?

2. Literature Review

2.1 Theoretical Framework

This study is anchored in experiential learning theory and morphological awareness theory, which together explain how derivational knowledge develops through active engagement and linguistic analysis (Kolb, 1984; Nagy et al., 2014). In the Moroccan EFL university context, where learners' exposure to English outside the classroom is limited, experiential learning provides a learner-centered approach that emphasizes meaningful participation, real-world application, and knowledge construction through experience (Kolb, 1984). This perspective aligns with constructivist theories, which view learning as an active process of meaning-making through interaction with context (Piaget, 1972; Vygotsky, 1978).

At the linguistic level, morphological awareness theory highlights the role of word-structure knowledge in vocabulary development and reading comprehension (Carlisle, 2000; Kieffer & Lesaux, 2012). Derivational knowledge enables learners to decode unfamiliar words, expand vocabulary, and develop both receptive and productive language skills (Nagy et al., 2014). This study therefore conceptualizes derivational knowledge development as a dynamic process shaped by experiential learning, contextualized input, and meaningful language use. Experiential learning is thus theorized as an effective pedagogical approach for enhancing derivational knowledge in Moroccan EFL reading comprehension classrooms.

2.2 Derivational Knowledge and Vocabulary Development

Derivational morphology is one component of what Nation (2005) describes as morphological knowledge, which includes both inflectional and derivational processes. Unlike inflectional morphology (which changes word form for grammatical reasons like number or tense), derivational morphology often changes the meaning or part of speech (e.g., act (verb) → action (noun), clear (adjective) → clarify (verb)). Nation points out that derivational knowledge refers to learners' understanding of how new words can be formed from existing base words through the use of affixes (prefixes and suffixes) or other morphological processes. This type of knowledge enables language learners to recognize and produce different forms of a word that may vary in meaning, function, or grammatical category.

Research in second language acquisition has established derivational knowledge as a key component of lexical competence (Schmitt & Zimmerman, 2002). This implies that learners who understand derivational relationships can more efficiently acquire new vocabulary, as knowledge of one word provides a foundation for understanding

morphologically related words. Furthermore, derivational awareness supports reading comprehension by enabling readers to parse unfamiliar words into meaningful components (Kieffer & Lesaux, 2008).

Derivational morphology plays a crucial role in vocabulary acquisition and reading development, especially for EFL learners. Research has increasingly emphasized that explicit instruction in morphological patterns significantly enhances students' ability to understand and retain complex vocabulary, particularly in academic contexts (Nagy & Townsend, 2012). This body of work suggests that derivational knowledge not only supports lexical growth but also contributes to deeper comprehension and more effective communication.

Veratharajoo (2016), in a study conducted with ESL learners in Malaysia, investigated the impact of morphemic analysis instruction on vocabulary development. The findings revealed that students who received structured morphological training demonstrated greater gains in vocabulary retention and usage compared to those taught using traditional methods. This aligns with broader evidence suggesting that teaching morphological components, especially derivational affixes, can serve as an effective pedagogical tool for improving lexical competence. Bowers, Kirby, and Deacon (2010) provide further empirical support for this approach through a meta-analytic review of morphological instruction. Their synthesis of multiple studies indicates that interventions focusing on roots, prefixes, and suffixes yield measurable improvements in spelling, reading comprehension, and vocabulary acquisition. These benefits were observed across diverse age groups and proficiency levels, reinforcing the idea that morphological awareness is a foundational skill that can enhance literacy outcomes broadly. By the same token, Singson, Mahony, and Mann (2000) explore the relationship between reading ability and morphological awareness, particularly in relation to derivational suffixes such as *-ness*, *-tion*, and *-ment*. They found that students with stronger reading abilities were more adept at recognizing and applying these suffixes to infer meanings of unfamiliar words. This suggests that derivational knowledge may serve as a mediator in the development of advanced reading skills, particularly among EFL learners.

In line with these findings, Agbayani (2021) advocates for a shift toward direct morphological instruction in ESL classrooms. His study highlights how explicit teaching of word formation rules, including derivation, leads to more consistent vocabulary gains and improved performance on standardized assessments. He argues that embedding morphological strategies into regular curriculum design can help bridge the gap between basic vocabulary learning and academic language proficiency.

From a cognitive perspective, Bozic and Marslen-Wilson (2010) examine the neurocognitive distinctions between inflectional and derivational morphology. Their research shows that derivational processing engages different neural pathways than inflectional morphology, indicating that it involves higher-order linguistic and conceptual processing. This underscores the complexity of derivational knowledge and its integral role in advanced language use and comprehension. In accordance with the

previous studies, Nation (2001a) emphasizes that explicit teaching of derivational patterns can enhance vocabulary acquisition, particularly in academic contexts where complex word forms are frequent. Thus, Learners who develop strong derivational knowledge are better equipped to handle lexical complexity and understand nuanced meanings in texts.

Taken together, these studies (e.g. Agbayani, 2021; Bowers et al., 2010; Bozic & Marslen-Wilson, 2010) suggest that derivational morphological knowledge is a powerful resource for vocabulary development, especially in educational settings where students are expected to engage with academic texts. Integrating explicit morphological instruction into language curricula can empower learners to decode unfamiliar words, build richer semantic networks, and improve both reading and writing performance.

However, derivational morphology poses particular challenges for EFL learners. The English derivational system is characterized by irregularity, multiple affixes with similar meanings, and complex interactions with phonology and orthography. Moreover, learners' first language may have different morphological structures, leading to transfer errors or avoidance strategies.

2.3 Derivational Morphological Awareness in Moroccan EFL Contexts

In the Moroccan context, there has been growing interest in understanding how derivational morphological awareness contributes to vocabulary development and reading comprehension among English as a Foreign Language (EFL) learners in Morocco. Several studies have explored this area, emphasizing the importance of integrating morphological instruction into language teaching practices to support students' lexical and literacy growth.

Harraqi (2017) investigated the relationship between morphological knowledge and vocabulary breadth among university-level EFL students in Morocco. The study found a strong positive correlation between students' ability to recognize and manipulate derivational forms and their overall vocabulary size. Harraqi concluded that explicit attention to morphological patterns, particularly derivational morphology, can significantly enhance lexical access and retention, especially when dealing with academic vocabulary. This aligns with earlier cross-linguistic research by Al-Qadi (1991), who examined how Arab speakers acquire English derivational morphology. These studies revealed that Arabic-speaking learners often face challenges in recognizing and applying English suffixes such as *-er*, *-tion*, and *-ment*, due to differences in morphological structures between Arabic and English. However, Al-Qadi also noted that with appropriate instruction, these learners could develop effective strategies for decoding word meanings through derivational analysis.

Additionally, Nouri and Zerhouni (2016) and Masrai (2016) further supported the importance of morphological knowledge by demonstrating its impact on lexical processing among Arab EFL learners. His findings suggest that learners who possess higher levels of morphological awareness are more likely to infer the meanings of unfamiliar words during reading tasks. This implies that derivational knowledge not

only supports vocabulary acquisition but also enhances reading fluency and comprehension, and bridges the gap between basic vocabulary learning and academic language proficiency.

While most of these studies focus on general vocabulary and reading skills, Ech-Charfi and Bouaddi (2023) contributed to the field by examining receptive vocabulary size in relation to morphological knowledge in Modern Standard Arabic. Although not directly focused on English, their work provides relevant insights into how morphological awareness influences lexical depth in Semitic languages, which share structural similarities with Arabic, a language commonly spoken by Moroccan learners. Therefore, derivational morphological awareness is a critical component of language proficiency for Moroccan EFL learners. Despite the linguistic complexity involved, evidence suggests that targeted instruction in derivational patterns can lead to measurable improvements in both vocabulary acquisition and reading comprehension.

Studies of morphological instruction have generally supported the effectiveness of explicit teaching. A meta-analysis by Goodwin and Ahn (2013) found that morphological instruction yielded moderate effects on literacy outcomes for struggling readers. Similarly, Bowers, Kirby, and Deacon (2010) reported that morphological instruction benefited learners' word reading, spelling, and vocabulary development.

However, most intervention studies have employed direct instruction methods: teachers present morpheme meanings, provide examples, and guide students through practice exercises. While effective, this approach may not optimize deeper learning processes such as discovery, hypothesis-testing, and contextualized application. These latter processes are central to experiential learning theory.

2.4 Experiential Learning in Language Education

The experiential learning approach developed by Kolb (1984) is a widely recognized framework for understanding how individuals learn. It stands out from previous 20th-century theories, which often took opposing stances. Kolb's model draws, mainly, from constructivist principles, arguing that learning happens when individuals actively construct their own knowledge through interaction with their environment. Drawing on the work of Piaget, Dewey, and Lewin, who all highlighted the importance of experience in learning and development, Kolb's holistic theory defines learning as a cyclical, ongoing process. This process involves four stages: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE). In different terms, learners must be able to immerse themselves fully in new experiences (CE), reflect on them (RO), form abstract ideas based on these experiences (AC), and finally apply their conclusions to solve problems (AE).

Kolb (1984) argues that learning is most effective when learners engage fully in his experiential learning cycle, beginning with direct, concrete experiences and culminating in active experimentation. This approach integrates both the abstract and the concrete, combining action with reflection and thinking with doing. The significance of Kolb's model lies in its ability to unite these seemingly opposing elements. By emphasizing that

learning is experiential, Kolb draws attention to the importance of designing educational experiences that fully immerse learners in all stages of this learning cycle. At the heart of experiential learning is the idea that learners learn best when they are fully engaged in the process through hands-on experiences and experimentation. In support of this, Morris (2019) conducted a systematic literature review, revealing that Kolb's model is particularly effective in fostering learner involvement and reflection in real-world situations. According to Morris, Kolb's theory has been instrumental in shaping educational practices across a variety of settings, including higher education and workplace training

Experiential learning has been applied to various domains of language education, including communicative competence development, intercultural learning, and writing instruction (Kolb & Kolb, 2005). The underlying premise is that language is best learned through use, that is, through engagement in authentic communicative activities that require learners to mobilize their linguistic resources for genuine purposes. Activities such as role-plays, simulations, field trips, and collaborative projects allow learners to apply language meaningfully, supporting the view that knowledge is most effectively acquired through use (Grabe, 2009; Thornbury, 2002). These approaches also cultivate critical thinking, problem-solving, and reflection (Kolb & Kolb, 2005), creating stronger connections between classroom input and real-world communication (Vandergrift, 1999). Moreover, Bouhazzama and Mssassi (2021) demonstrated the effectiveness of Kolb's cycle in environmental education during a Moroccan summer university, where participants engaged in community-based activities that fostered both knowledge and skill development. Similarly, Pipitone (2017), in a study of study-abroad programs in Morocco and Indonesia, found that immersion in culturally rich environments promoted deeper learning by connecting academic content with lived experiences. Both studies reinforce the value of contextualized, participatory learning and further support this perspective, emphasizing that learning occurs most effectively through interaction with one's environment.

2.5 Research Gap and Conceptual Framework

While experiential learning has been advocated in general language education, its application to teaching specific linguistic subsystems, particularly morphology, has received little empirical attention. This study addresses this gap by situating derivational instruction within an experiential learning framework. The conceptual framework guiding this research integrates derivational knowledge components (recognition, analysis, production) with Kolb's experiential learning cycle, positing that engagement in each phase of the cycle enhances different aspects of morphological competence.

3. Methods

3.1 Research Design

This study employed a quasi-experimental research design with pre-, post-, post and delayed post-test measures. The main purpose of this work is to explore how one variable influence another, therefore, seeking to determine causality between variables in light of practical constraints. Due to the fact that the research was conducted in university classes and given that the classes had already been assigned, randomization was not feasible (Creswell & Creswell, 2018). Hence, this design allows for causal inferences while acknowledging the limitations imposed by non-randomization.

3.2 Participants

Participants were (n=80) EFL undergraduate students enrolled at L'École Supérieure de l'Éducation et de la Formation (ESEF). From this accessible pool, a total of 80 participants were recruited and divided into two intact classes: a control group (n = 40) and a treatment group (n = 40). According to Creswell and Creswell (2018), the use of intact groups is a common practice in quasi-experimental designs in education, as random assignment is not always feasible in classroom-based research.

3.3 Sampling Procedure

A convenience sampling strategy was employed, utilizing intact classes due to institutional scheduling constraints. To enhance group comparability, both classes were selected from the same proficiency level (intermediate) based on university placement test scores. Additionally, pre-test scores were used to statistically control for initial differences in derivational knowledge.

3.4 Instructional Interventions

3.4.1 Experiential Learning Group

The experiential learning group received eight weeks of instruction structured around David Kolb's experiential learning cycle. Derivational instruction was systematically integrated into reading comprehension tasks, allowing morphological learning to occur within authentic meaning-based contexts rather than in isolation.

Instruction began with concrete experiential tasks that enabled learners to encounter derived forms embedded in reading passages, where affixes were explored as semantic and grammatical cues that support lexical inference, text interpretation, and comprehension processes. This integration positioned derivational morphology as a cognitive tool for meaning-making in reading, reinforcing its role in both vocabulary development and comprehension skill enhancement.

This was followed by a reflective phase, in which students participated in structured small-group discussions to identify emerging patterns, compare observations, and synthesize shared insights across groups.

The cycle culminated in abstract conceptualization, where learners, through teacher-guided dialogue, formulated generalizations about affix meanings and functions, constructed personal reference charts of derivational patterns, and articulated rules while recognizing exceptions.

Therefore, this cyclical instructional structure promoted active knowledge construction, deeper cognitive processing, and durable learning, positioning derivational morphology as a meaning-based, conceptually grounded component of EFL reading instruction rather than a set of isolated formal rules.

3.4.2 Control Group

In contrast to the experiential learning condition, the control group was taught through a traditional explicit instruction model, with the same instructional duration and identical derivational content to ensure comparability between groups. Instruction followed a teacher-centered approach in which linguistic knowledge was transmitted directly rather than constructed through learner experience.

Each instructional unit began with formal teacher-led explanations of affix meanings and functions, supported by illustrative examples of derived forms. Word-formation rules were presented explicitly, and students were guided through systematic descriptions of morphological patterns. Practice activities primarily consisted of structured worksheets, including fill-in-the-blank tasks, matching exercises, and controlled drills designed to reinforce form–meaning associations.

3.5 Instrumentation

At L'École Supérieure de l'Éducation et de la Formation, participants were first administered a standardized placement test to establish baseline equivalence and ensure group comparability prior to the intervention. The researcher employed Pearson Longman ELT Placement Test (2006) as a diagnostic instrument to assess general language proficiency and provide an objective measure of students' initial competence beyond institutional admission criteria. Results indicated that all participants ($n = 80$) were classified at the A2 level of the Common European Framework of Reference for Languages (CEFR). This latter confirmed homogeneity across groups. The standardized administration and scoring procedures strengthened the internal validity and reliability of the research design, which ensured that subsequent learning gains could be attributed to the instructional intervention rather than pre-existing proficiency differences.

3.5.1 Derivational Knowledge Test

To assess learners' derivational development across the intervention, three parallel researcher-designed assessments were administered at different stages: a pre-test, an immediate post-test, and a delayed post-test. Each instrument was constructed to measure both receptive and productive derivational knowledge, ensuring a balanced evaluation of recognition and production abilities. The tests followed an identical

structural format while using different lexical items, allowing for comparability across administrations and minimizing test–retest effects.

All three assessments employed a uniform design and scoring procedure, with items targeting learners' ability to identify and generate derived forms from base words. Receptive knowledge was measured through recognition-based tasks (e.g., selection and matching), while productive knowledge was elicited through controlled output activities (e.g., word formation and sentence construction). Scoring was dichotomous, with each correct response receiving one point, ensuring objective and consistent measurement.

The pre-test established a baseline of participants' derivational competence prior to instruction, the immediate post-test measured short-term instructional effects, and the delayed post-test, administered several weeks later, examined retention and long-term learning. This three-stage assessment design enabled a systematic analysis of both immediate gains and sustained development, providing a robust framework for evaluating the impact of the instructional intervention on receptive and productive derivational knowledge development

4. Results and Discussion

Prior to inferential analysis, the researcher conducted preliminary assumption testing to determine the appropriateness of the statistical procedures to be applied. Specifically, two fundamental assumptions were evaluated: (1) distributional normality and (2) homogeneity of variances. These diagnostics ensured the valid selection between parametric and non-parametric analytical methods and strengthened the statistical integrity of the findings.

4.1 Normality

In this study, normality was assessed using both the Shapiro–Wilk (S–W) and Kolmogorov–Smirnov (K–S) tests, standard procedures in SPSS for evaluating deviations from a normal distribution. The Shapiro–Wilk test is generally preferred for smaller samples, while the K–S test provides a complementary assessment. Normality was examined for baseline scores of receptive and productive derivational knowledge since parametric analyses require approximately normal data to ensure valid inferences (Field, 2018). Both tests indicated significant deviations from normality in all measures for both groups ($p < .001$), confirming that the data did not meet the normality assumption.

As shown in the table below, the findings demonstrate that the assumption of normality was violated across all baseline measures. Since parametric tests require approximately normally distributed data, non-parametric alternatives were deemed more appropriate for baseline group comparisons.

Table 1: Tests of Normality for Pre-Treatment
 Receptive vs. Productive Derivational Knowledge

Pre- comparison	Group (1=Exp, 2=Control)	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
Receptive Derivational Knowledge – Pre	Control Group	,230	40	,000	,825	40	,000
	Experimental Group	,319	39	,000	,750	39	,000
Productive Derivational Knowledge – Pre	Control Group	,304	40	,000	,750	40	,000
	Experimental Group	,260	39	,000	,791	39	,000

a. Lilliefors Significance Correction

4.2. Homogeneity of Variances

Levene's Test for Equality of Variances was performed to examine whether the assumption of homogeneity of variances was met across groups (Table 11). The results indicated no significant differences, confirming that the variance of scores was comparable between the experimental and control groups. Specifically, the results were as follows:

Receptive Derivational Knowledge: $F(1, 77) = 0.45, p = .506$; and Productive Derivational Knowledge: $F(1, 77) = 0.71, p = .401$.

Table 1: Levene's Test for Equality of Variances-Pre-test
 Derivational Knowledge (Experimental vs Control Groups)

Variable	F-value	Sig. (p-value)
Receptive Derivational Knowledge – Pre	0.447	0.506
Productive Derivational Knowledge – Pre	0.712	0.401

The results in table 2 present the results of Levene's Test for Equality of Variances for the pre-test scores of both receptive and productive derivational knowledge.

- For Receptive Derivational Knowledge, the F-value is 0.447 with a p-value of 0.506,
- For Productive Derivational Knowledge, the F-value is 0.712 with a p-value of 0.401.

Since both p-values are greater than the conventional significance threshold ($p > 0.05$), the test indicates that there are no significant differences in variances between the experimental and control groups. This confirms that the assumption of homogeneity of variances is satisfied. Although these findings confirm the initial homogeneity of the groups, the consistent violation of normality across variables necessitated the use of non-parametric analyses for pre-treatment group comparisons.

4.3 Descriptive Statistics

Table 3 presents descriptive statistics for the experimental and control groups prior to the intervention. The overall sample demonstrated relatively low baseline performance across both receptive and productive derivational knowledge measures.

Examination of the mean scores across receptive and productive vocabulary derivational knowledge indicates generally low baseline performance. For receptive

derivational knowledge, participants scored an average of 1.78 (SD = 0.80) , and for productive derivational knowledge, the mean score was.

These descriptive statistics suggest that the participants possessed modest vocabulary knowledge across both receptive and productive dimensions prior to the intervention. The relatively low means, clustered near the lower end of the measurement scale, indicate that the sample had limited prior exposure or proficiency in the specific vocabulary dimensions under investigation. At the same time, the standard deviations demonstrate some variability in participants' baseline knowledge, reflecting individual differences in prior learning experiences.

While the descriptive statistics provide a useful overview of central tendency and dispersion, they cannot, in isolation, establish equivalence between the experimental and control groups. Given the non-normal distributions identified in the preceding normality tests (all $p < .001$), relying solely on parametric interpretation of these means would be misleading. Furthermore, although Levene's test indicated homogeneity of variances, the combination of non-normality and low baseline scores suggests that group comparisons require a cautious, non-parametric approach.

Table 2 : Descriptive Statistics of both experimental and control groups prior to the intervention

Group (1=Exp, 2=Control)	N	Minimum	Maximum	Mean	Std. Deviation
Receptive Derivational Knowledge – Pre	80	1,00	2,00	1,500	,50315
Productive Derivational Knowledge – Pre	80	1,00	4,00	1,7750	,79516
Stdent ID	80	1,00	3,00	1,6835	,68956
Valid N (listwise)	80	1,00	40,00	20,5000	11,61623

The descriptive statistics show that the experimental and control groups were comparable at the pre-test stage, with similar mean scores across both receptive and productive derivational knowledge measures. The means, ranging from approximately 1.68 to 1.77, indicate that participants had a basic level of derivational knowledge prior to the intervention. Relatively small standard deviations (0.68-0.79) suggest limited variability within groups, further confirming the homogeneity of initial proficiency and providing a reliable baseline for evaluating the effects of the instructional treatment.

4.4 Inferential Statistics

Due to the non-normal distributions and confirmed homogeneity of variances, non-parametric analyses were conducted to compare the experimental and control groups at baseline. The Mann–Whitney U test was used as a distribution-free alternative to the independent samples t-test.

The results of the M–W U tests are summarized in Table 3. no statistically significant differences were observed between the experimental and control groups. For instance, receptive derivational knowledge did not differ between groups, $U = 2.00$, $Z = 0.00$, $p = 1.00$. Similarly, no significant group differences were found productive derivational knowledge ($U = 1.00$, $Z = -1.00$, $p = .317$).

These findings confirm that the experimental and control groups were statistically equivalent at pre-test across receptive and productive derivational knowledge. In other words, none of these comparisons reached statistical significance (all $p > .05$), indicating that the two groups were statistically equivalent at baseline. Thus, any differences observed at post-test or delayed-test can be attributed with greater confidence to the intervention rather than to the prior differences between the groups.

Table 3: Mann–Whitney U Test Results for Pre-Treatment Derivational Knowledge

	Student ID	N	Mean Rank	Sum of Ranks
Receptive Derivational Knowledge – Pre	1,00	2	2,50	5,00
	2,00	2	2,50	5,00
	Total	4		
Productive Derivational Knowledge – Pre	1,00	2	3,00	6,00
	2,00	2	2,00	4,00
	Total	4		

a. Ranks

Table 4 presents the Mann–Whitney U test results for pre-treatment derivational knowledge across receptive and productive measures. The mean ranks for both groups are generally very close, indicating no substantial difference between them before the intervention. This suggests that the two groups were comparably matched in their initial vocabulary proficiency, which establishes a fair baseline for subsequent treatment comparisons. The balanced pre-test results strengthen the internal validity of the study by confirming group equivalence prior to instruction.

Table 5: Pre-Test Comparison of Receptive and Productive Derivational Knowledge (Mann–Whitney U)

	Receptive Derivational Knowledge - Pre	Productive Derivational Knowledge - Pre
Mann-Whitney U	2,000	1,000
Wilcoxon W	5,000	4,000
Z	,000	-1,000
Asymp. Sig. (2-tailed)	1,000	,317
Exact Sig. [2*(1-tailed Sig.)]	1,000 ^b	,667 ^b

a. Grouping Variable: STDENT ID

b. Not corrected for ties.

Note. Group 1 = Experimental; Group 2 = Control.

The Mann–Whitney U test results show no statistically significant differences between the experimental and control groups across receptive and productive derivational knowledge measures, as all p-values (Asymp. Sig.) exceed the 0.05 threshold. This indicates that both groups were statistically equivalent prior to the intervention, and confirms baseline comparability in receptive and productive vocabulary knowledge. Such equivalence strengthens the internal validity of the study and ensures that any post-

treatment differences can be attributed to the instructional intervention rather than pre-existing disparities.

4.5 Post- Treatment Comparison

4.5.1 Between-Group Analysis

Given the clear non-normality, non-parametric methods, specifically the Mann–Whitney U test, are appropriate for comparing the experimental and control groups. This approach ensures that statistical conclusions remain valid despite the distributional irregularities.

Table 6: Between group analysis (Mann–Whitney U)

	Group (1=Exp, 2=Control)	N	Mean Rank	Sum of Ranks
Receptive Derivational Knowledge – Post	Control	40	23,90	956,00
	Experimental	40	57,10	2284,00
	Total	80		
Productive Derivational Knowledge – Post	Control	40	27,40	1096,00
	Experimental	40	53,60	2144,00
	Total	80		

A. Receptive Derivational Knowledge - Post

Control group (n = 40): Mean rank = 23.90, Sum = 956.00

Experimental group (n = 40): Mean rank = 57.10, Sum = 2284.00

The experimental group significantly outperformed the control group. The higher mean rank indicates better post-test scores for receptive derivational knowledge in the experimental group.

B. Productive Derivational Knowledge - Post

Control group: Mean rank = 27.40, Sum = 1096.00

Experimental group: Mean rank = 53.60, Sum = 2144.00

The higher mean rank in the experimental group shows they were more capable of accurately producing derived word forms.

4.6. Within-group Analysis (Control Group - Pre and Post)

The researcher conducted the Wilcoxon Signed Ranks Test to evaluate whether the control group demonstrated significant changes in vocabulary knowledge from pre-test to post-test. Table 17 presents the distribution of negative ranks (declines), positive ranks (gains), and ties (no change).

Table 7: Test Statistics

	Receptive Derivational Knowledge – Post - Receptive Derivational Knowledge – Pre	Productive Derivational Knowledge – Post - Productive Derivational Knowledge – Pre
Z	-1,291 ^b	-2,646 ^b
Asymp. Sig. (2-tailed)	,197	,008

Wilcoxon Signed Ranks Tests were conducted to compare pre- and post-test scores for derivational knowledge. The results are summarized in Table 7.

For receptive derivational knowledge, no statistically significant differences were found, especially that $Z = -1.29$, $p = .197$ failed to reach significance, these effect sizes were calculated using Cohen's formula ($r = Z/\sqrt{N}$). With $N = 40$, (Cohen, 1988). These results suggest that learners in the control group did not demonstrate meaningful gains in receptive derivational knowledge during the study period.

While productive derivational knowledge showed a significant improvement, $Z = -2.65$, $p = .008$. The negative Z-value indicates that the control group showed a significant change from pre-test to post-test.

Overall, the control group displayed no significant growth in receptive derivational knowledge and only limited improvement in certain productive dimensions. The significant changes in productive derivational knowledge might reflect incidental vocabulary learning or test familiarity effects, rather than systematic development.

4.7 Within-group Analysis (Experimental Group – Pre and Post)

Since the use of non-parametric statistical methods is recommended for subsequent analyses. The Wilcoxon Signed-Rank Test is indeed the most appropriate non-parametric alternative to the paired-samples t-test for within-group comparisons.

Table 8: Wilcoxon Signed-Rank Test Results (Experimental Group)

		N	Mean Rank	Sum of Ranks
Receptive Derivational Knowledge – Post - Receptive Derivational Knowledge – Pre	Negative Ranks	0 ^a	,00	,00
	Positive Ranks	32 ^b	16,50	528,00
	Ties	8 ^c		
	Total	40		
Productive Derivational Knowledge – Post - Productive Derivational Knowledge – Pre	Negative Ranks	2 ^j	6,50	13,00
	Positive Ranks	29 ^k	16,66	483,00
	Ties	8 ^l		
	Total	40		

- a. Receptive Derivational Knowledge – Post < Receptive Derivational Knowledge – Pre,
- b. Receptive Derivational Knowledge – Post > Receptive Derivational Knowledge – Pre,
- c. Receptive Derivational Knowledge – Post = Receptive Derivational Knowledge – Pre,
- d. Productive Derivational Knowledge – Post < Productive Derivational Knowledge – Pre,
- e. Productive Derivational Knowledge – Post > Productive Derivational Knowledge – Pre,
- f. Productive Derivational Knowledge – Post = Productive Derivational Knowledge – Pre.

4.7.1 Receptive Derivational Knowledge

All 32 participants showed improvement from pre- to post-test (positive ranks), with no negative ranks and 8 ties. This indicates a consistent and substantial gain in receptive derivational knowledge after the intervention.

4.7.2 Productive Derivational Knowledge

29 participants improved, 2 declined, and 8 had no change. The pattern supports significant gains in productive derivational use following the treatment.

The majority of participants demonstrated significant improvement from pre-test to post-test. This consistent pattern of positive ranks indicates that the EL approach to teaching had a notably positive effect on both receptive and productive vocabulary knowledge, particularly in areas related to derivation, polysemy, and register appropriateness.

4.8. Delayed Post Test Comparison

Delayed Post-Test Results for the Control Group

Table 9: Friedman Test

	Mean Rank
Receptive Derivational Knowledge - Pre	8,84
Receptive Derivational Knowledge – Post	10,08
Receptive_Derivational_Delayed	10,08
Productive Derivational Knowledge – Pre	7,81
Productive Derivational Knowledge – Post	10,80
Productive_Derivational_Knowledge_Delayed	10,80

The Friedman test revealed a statistically significant difference in scores across the three time points, $\chi^2(17, N = 40) = 46.336, p < .001$. Receptive Derivational Knowledge increased from a mean rank of 8.84 at pre-test to 10.08 at both post-test and delayed test; Productive Derivational Knowledge rose from 7.81 at pre-test to 10.80 at post-test and delayed test. However, these differences, while statistically significant, were numerically small. Mean score increases rarely exceeded 0.25 points on the scale (Table 22), suggesting that the observed gains were minimal in magnitude

4.9 Delayed Test Results for the Experimental Group

Table 10: Friedman Test

	Mean Rank
Receptive Derivational Knowledge – Pre	5,17
Receptive Derivational Knowledge – Post	12,03
Receptive_Derivational_Delayed	13,32
Productive Derivational Knowledge – Pre	5,03
Productive Derivational Knowledge – Post	10,59
Productive_Derivational_Knowledge_Delayed	10,59

Table 11: Test Statistics^a

N	39
Chi-Square	277,614
Df	16
Asymp. Sig.	,000

a. Friedman Test

The mean ranks demonstrate consistent patterns of improvement for each of the receptive Derivational Knowledge tasks, pre-test scores had the lowest ranks, while post- and delayed-test scores showed substantially higher ranks, especially for Receptive Derivational Knowledge: Pre: 5.17 → Post: 12.03 → Delayed: 13.32.

The same improvement pattern was observed in productive Derivational Knowledge Pre: 5.03 → Post: 10.59 → Delayed: 10.59. This suggests that the intervention led to meaningful and sustained improvements in both receptive and productive aspects of derivational knowledge across the experimental group.

4.10 Discussion

The findings of the present study demonstrate a clear and substantial divergence between the experimental and control groups in both receptive and productive derivational knowledge. Learners exposed to experiential learning achieved markedly higher performance levels in recognizing and producing derived forms, which indicates that EL effectively supported the integration of derivational morphology into their lexical systems. These outcomes suggest that experiential learning facilitates not only surface-level recognition of morphological patterns but also their active and functional use, reflecting deeper lexical processing and consolidation.

These results are consistent with previous research emphasizing the role of morphological awareness in vocabulary development. Studies by Harraqi (2017) and Masrai (2016) have shown that sensitivity to morphological structure is a strong predictor of vocabulary growth, highlighting the interconnectedness of lexical breadth and depth. At the same time, Harraqi (2017) cautions that morphological awareness alone does not fully account for vocabulary acquisition, as factors such as input frequency, semantic connectivity, and individual learning strategies also play a critical role. This perspective aligns with the present findings, which indicate that while derivational instruction is highly beneficial, its effectiveness is maximized when embedded within rich learning environments that provide meaningful exposure and opportunities for application. In this sense, experiential learning functions not as an isolated instructional technique but as a supportive framework that amplifies the impact of morphological awareness on lexical development.

Further theoretical support is provided by Bowers, Kirby, and Deacon (2010), who argue that morphological instruction strengthens both word recognition and meaning construction processes. When interpreted alongside the current data, this suggests that derivational awareness operates as a facilitative mechanism in vocabulary growth, particularly when learners engage in tasks that require active analysis, hypothesis

formation, and language use. The experiential learning model employed in this study appears to operationalize these processes by combining discovery, reflection, and application in a coherent instructional cycle.

The present findings also resonate with research in EFL reading contexts. Nouri and Zerhouni (2016) emphasize that limited morphological awareness can impede comprehension of texts containing complex derived forms, restricting learners' ability to interpret meaning efficiently. The observed gains in derivational knowledge in this study therefore, suggest not only improvements in vocabulary recognition and production but also potential enhancement of reading comprehension processes, as learners become better equipped to decode and integrate morphologically complex vocabulary within textual contexts.

In addition, Agbayani (2021) highlights the importance of active, contextually grounded engagement with vocabulary for the development of productive language use. The implementation of Kolb's cycle reflects this principle by situating derivational learning within meaningful tasks and authentic language activities. This pedagogical orientation enables learners to move beyond mechanical memorization toward flexible, transferable lexical competence.

In light of the aforementioned, these findings indicate that experiential learning is particularly effective in supporting derivational knowledge because it integrates repeated exposure, contextualized input, and opportunities for active production. These latter are conditions widely recognized in the literature as essential for durable vocabulary acquisition and reading development. The results, therefore, provide strong empirical support for the pedagogical value of combining experiential instruction with explicit attention to morphological structure in EFL contexts, as this integrated approach enhances both recognition and productive control of derived vocabulary while promoting deeper lexical learning.

5. Recommendations

5.1 Implications

These findings contribute to experiential learning theory by extending its application to the domain of morphological instruction. Kolb's (1984) framework, originally developed in the context of management education, demonstrates robust applicability to language learning contexts. The results suggest that the experiential learning cycle effectively supports not only broad competencies (e.g., intercultural communication) but also specific linguistic subsystems.

The findings also inform theories of morphological development in second language acquisition. The superior transfer performance of the experiential group suggests that morphological knowledge developed through discovery and application may be more flexible and adaptable than knowledge acquired through explicit instruction alone. This aligns with usage-based approaches to language acquisition,

which emphasize the role of meaningful language use in developing linguistic competence (Ellis, 2002).

For EFL educators, these findings offer practical guidance for teaching derivational morphology. Rather than relying solely on explicit instruction and decontextualized exercises, teachers might incorporate experiential learning activities that engage students in active discovery, collaborative exploration, and creative application.

5.2 Limitations

Several limitations should be considered when interpreting these findings. First, the quasi-experimental design, while appropriate for educational settings, cannot completely rule out selection threats. Second, the study was conducted at a single institution with intermediate-level learners, limiting generalizability to other populations (e.g. beginning learners, different educational contexts). Third, the relatively short intervention period (eight weeks) may not capture long-term developmental trajectories. Therefore, extended longitudinal research would provide stronger evidence of sustained effects.

6. Conclusion

This study provides evidence that experiential learning significantly enhances EFL university students' derivational knowledge compared to traditional explicit instruction. The experiential group demonstrated superior performance on recognition, analysis, and production measures, with effects maintained on delayed testing and extending to transfer items. These findings support the integration of experiential learning principles into morphological instruction and contribute to broader theoretical understandings of how meaningful engagement supports language development.

For educators, the message is clear: derivational morphology need not be taught through rote memorization and decontextualized exercises alone. By engaging students in cycles of concrete experience, reflective observation, abstract conceptualization, and active experimentation, teachers can foster deeper, more transferable morphological knowledge. For researchers, these findings invite continued exploration of how experiential approaches can optimize language learning across linguistic domains and learner populations.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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