

## Research Article

# Enhancing Iranian EFL Learners' Vocabulary Depth and Breadth by Integrating of Extensive Reading and Writing: A Mixed Methods Study

Roya Ranjbar Mohammadi <sup>1</sup>, Ali Abdollahi <sup>2</sup> 

<sup>1</sup> Department of English, Bon.C., Islamic Azad University, Bonab, Iran

<sup>2</sup> Department of Mathematics, Mar.C., Islamic Azad University, Maragheh, Iran


### Abstract

Although vocabulary instruction has received considerable attention in EFL contexts, limited research has examined how combining receptive and productive modes of language learning may affect different dimensions of vocabulary development. Understanding how instructional modes influence these dimensions is crucial for effective teaching. The aim of this explanatory mixed-methods study was to examine the effect of integrating extensive reading and writing on the development of vocabulary depth and breadth. To this end, three groups of Iranian elementary EFL learners, selected through convenience sampling, practiced three different modes of instruction: extensive reading only (RO), writing only (WO), and extensive reading plus writing (RW). The data were collected through the word associates test (WAT), vocabulary levels test (VLT), and semi-structured interviews to capture both quantitative performance and qualitative experiences. Results indicated that both the RO and RW groups outperformed the WO group in vocabulary depth and breadth, with the RW instruction proving most effective. Furthermore, linear regression analyses revealed substantial shared variance between WAT and VLT scores across all groups. This highlights a strong relationship between vocabulary depth and breadth. Additionally, thematic analysis of the semi-structured interviews identified three key themes: enhanced vocabulary knowledge, increased engagement in language use, and the development of self-regulated learning. These results suggest that vocabulary depth and breadth are two interconnected aspects of vocabulary knowledge that mutually support one another. This study has important implications for syllabus designers, teachers, and learners in EFL settings.

**Keywords:** extensive reading, vocabulary breadth, vocabulary depth, writing

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© The Author(s), 2025  [royaranjbar@iau.ac.ir](mailto:royaranjbar@iau.ac.ir) Publisher: Qom Islamic Azad University



## 1. Introduction

There are two aspects of vocabulary knowledge: breadth and depth (Nation, 2001). Vocabulary breadth indicates the number of words a person knows at a particular proficiency level, whereas vocabulary depth concerns the quality of vocabulary knowledge, including how effectively a learner understands and uses a specific vocabulary (Dabbagh & Janebi Enayat, 2019; Nation, 2001). Both aspects of vocabulary knowledge are important for reading comprehension. According to Monster et al. (2020), vocabulary learning is an incremental and gradual process. Hence, the early acquired words tend to have greater depth than those learned later. These two dimensions act interactively and interdependently in the process of language learning (Zano, 2022).

Extensive reading is increasingly acknowledged as an effective method of language learning that involves reading large amounts of material for enjoyment (Robb & Ewert, 2024; Suryani & Siminto, 2023). This method aims to enhance positive reading habits, develop vocabulary and structural knowledge, and foster a passion for reading (Salameh, 2017). According to Nation (2001), there are two kinds of extensive reading: one that focuses on developing reading fluency and another that focuses on enhancing vocabulary knowledge. Extensive reading is based on Krashen's Input Hypothesis (Krashen, 1982), which posits that individuals acquire language through comprehensible input. In the same vein, extensive writing aligns with the concept of the comprehensible output hypothesis suggested by Swain (2000). According to this hypothesis, learning happens when a learner notices a gap in their linguistic knowledge, trying to improve their output by learning something new about language through language production. Producing output through speaking or writing persuades learners to process the language more deeply (Swain, 2000).

Although previous studies have found that extensive reading significantly contributes to improving the overall language proficiency of English as a foreign language (EFL) learner (Cabanilla García et al., 2024; Liu & Zhang, 2018; Sintia et al., 2025), limited research has been conducted on the combined effect of extensive reading and writing on various dimensions of vocabulary knowledge in EFL learners. Therefore, this study employed the linked skills approach, which strategically connects reading and writing (Nation & Newton, 2009) to compare the effect of the integrated use of extensive reading and writing on the enhancement of vocabulary depth and breadth of Iranian EFL learners. Hence, this research combined extensive reading as an input-oriented activity with extensive summary writing as an output-oriented activity to investigate their combined effect on the vocabulary

breadth and depth of EFL learners' vocabulary growth in Iran. Furthermore, few studies have used qualitative research to explore EFL learners' perceptions of such an integrated approach. Thus, the aim of this explanatory mixed-methods study was to investigate the effect of combined extensive reading and writing on the vocabulary depth and breadth of Iranian EFL learners and to explore their perceptions of how these practices supported their language learning. To that end, the following research questions were developed:

**RQ1.** To what extent are the three methods of extensive reading only (RO), extensive reading plus writing (RW), and writing only (WO) effective in improving the vocabulary depth and breadth?

**RQ2.** Are there significant differences among the three instructional methods (RO, RW, and WO) in their effects on Iranian EFL learners' vocabulary depth and breadth?

**RQ3.** Are there any relationships between the vocabulary depth and breadth among Iranian EFL learners?

**RQ4.** What are Iranian EFL learners' attitudes toward the use of extensive reading and writing in reading comprehension classes?

## **2. Literature Review**

Vocabulary knowledge comprises two interrelated dimensions of depth and breadth, each reflecting different aspects of word understanding and usage necessary for effective communication in a foreign language. The breadth of vocabulary involves understanding both the oral and written forms of the vocabulary, their basic uses, and their surface meanings, while vocabulary depth includes knowledge of word structure, meanings, and collocations. Vocabulary depth is as crucial as vocabulary breadth because it reflects how vocabulary is used receptively or productively, and its appropriateness in different contexts (Schmitt et al., 2011).

The conventional measures of lexical knowledge primarily assess vocabulary breadth, which focuses on the number of words a learner knows, but they do not reflect the depth of understanding of these words (Li & Kirby, 2014). The breadth of vocabulary knowledge can be measured by some common instruments like the Peabody Picture Vocabulary Test for L1 children and the Vocabulary Level Tests (VLT) for L2 and foreign language learners (Dunn & Dunn, 2009; Enayat et al., 2018; Schmitt et al., 2001).

In the same vein, Read (2000) described two approaches to measuring vocabulary depth: the dimensional and developmental approaches. The most

widely acknowledged test founded on the dimensional method is the Word Association Test (WAT), devised by Read (1995; 2000). The WAT is a potentially economical test, and it measures learners' familiarity with three aspects of vocabulary knowledge: synonym, polysemy, and collocation (Schmitt et al., 2011). The developmental measures, like the Vocabulary Knowledge Scale (VKS), employ scales to identify the learners' developing proficiency in lexical items (Paribakht & Wesche, 1997). The two dimensions of vocabulary knowledge are interrelated, and teachers do not need to teach them separately. They ought to be taught in conjunction with the foreign language context (Butler, 2019).

Vocabulary knowledge is regarded as a key element of reading comprehension (Brooks et al., 2021). Based on Perfetti's (2007) Lexical Quality Hypothesis, the best way to improve reading comprehension ability is through developing in-depth vocabulary knowledge. This hypothesis describes word knowledge development as a process in which a word's meaning is initially unfamiliar and becomes precisely clarified through extensive reading experiences.

Some studies have found a high correlation between vocabulary depth and breadth (e.g., Akbarian, 2010; Li & Kirby, 2014). In a study to investigate the relationship between the depth and the size of vocabulary knowledge for Iranian EFL learners, Akbarian (2010) administered WAT as a vocabulary depth test and VLT as a vocabulary size test to 112 ESP students in Iran. The results indicated a high correlation coefficient between WAT and VLT. Also, findings of the linear regression showed that VLT and WAT highly overlapped one another, and they had a significant level of shared variance among the participants. Li and Kirby (2014) examined the relationships between vocabulary depth and breadth and their impact on various elements of English reading in 246 EFL learners in China. They identified a moderate relationship between vocabulary depth and breadth. The findings demonstrated that the vocabulary breadth had a stronger effect on reading comprehension than the depth, and it contributed to an overall understanding of the reading materials. In contrast, the vocabulary depth played a main role in summary writing, which reflects a deeper processing of the text.

Wang (2013) also examined the impact of extensive reading on vocabulary knowledge of 45 elementary Taiwanese EFL learners. The participants read 30 English texts over fifteen weeks. Results indicated significant vocabulary growth after an extensive reading program, showing that this treatment had a strong impact on the implicit vocabulary learning of the participants with a lower proficiency level. This supports the idea that quantity of input plays a main role in vocabulary development.

Furthermore, Liu and Zhang (2018) administered a meta-analysis of data from 21 experimental studies to explore the impact of extensive reading on enhancing the vocabulary knowledge of EFL learners. The findings revealed that extensive reading had a significant positive impact on the vocabulary acquisition of EFL learners. In another study, Dabbagh and Janebi Enayat (2019) examined the relationships between EFL learners' vocabulary depth and breadth and their impact on descriptive writing assessments. The participants were 67 Iranian EFL learners who completed writing and vocabulary tests. The results of regression and correlation analyses indicated that (a) vocabulary breadth predicted overall writing assessment, whereas vocabulary depth was only associated with it; (b) vocabulary breadth also predicted vocabulary scores in writing, while vocabulary depth was merely correlated; and (c) mid-frequency vocabulary affected general writing performance, while low-frequency words significantly influenced vocabulary scores.

Cabanilla García et al. (2025) conducted an action research study with Ecuadorian primary EFL learners. They found that online extensive reading combined with visual strategies significantly enhanced vocabulary acquisition. Digital multimodal input, delivered through a virtual library, produced a strong effect size, confirming the effectiveness of technology-mediated extensive reading. Sintia et al. (2025) demonstrated that extensive reading substantially improved vocabulary acquisition among Indonesian EFL students. They highlighted the benefits of sustained, pleasure-based reading for language development, with participants' greater motivation, confidence, and vocabulary retention.

### **3. Method**

#### **3.1. Design**

This study adopted an explanatory sequential mixed-methods design to investigate the effects of extensive reading and writing on Iranian EFL learners' knowledge of vocabulary depth and breadth. A pretest-posttest quasi-experimental design was used in the quantitative stage of the study to determine the causal relationships between independent and dependent variables. Furthermore, a phenomenological qualitative design was used in the qualitative stage to explore Iranian EFL learners' perceptions and experiences regarding these practices.

### **3.2. Participants**

The initial sample for this study consisted of 65 undergraduate students that were selected from three intact EFL classes based on the convenience sampling technique. They were non-English majors, studying law, accountancy, and primary education at Islamic Azad University, Bonab, Iran. They had taken a reading comprehension course that aimed to enhance their vocabulary, grammar, and overall language proficiency at university.

To ensure the homogeneity of the participants, the Key English Test (KET) was administered at the outset of the study. Of the 65 students, 60 participants from three intact classes were chosen based on one standard deviation above and below the mean. They included 25 males and 35 females. These classes were randomly assigned to one of the three experimental groups: reading only (RO), reading and writing (RW), and writing only (WO).

In the qualitative phase of the study, five students from each of the three intact classes were purposefully selected to participate in the semi-structured interviews. The sample size in the qualitative phase of the study was determined based on the data saturation criterion in the way that after 15 interviews, no new information emerged from the data. All participants had been taken English from the seventh to the twelfth grade at school, only experiencing a grammar-translation method and an intensive reading approach. The native language of the participants was Turkish, and their age range was between 18-25.

### **3.3. Instruments**

#### ***3.3.1. The Key English Test (KET)***

The KET is a standardized language proficiency test designed by Cambridge University to measure basic language skills. It includes four sections: reading (36 questions), listening (20 questions), speaking, and writing (1 writing task). Because of the purpose of this study, only the writing and reading sections of this test were used to evaluate the participants' homogeneity regarding their language proficiency. The validity and reliability of KET has been widely approved in the Iranian EFL context (e.g., Mohammadi et al., 2020; Mohammadi et al., 2023).

#### ***3.3.2. Vocabulary Levels Test (VLT)***

The version 2 of the VLT of 2000 and 3000 word-frequency levels devised by Schmitt et al. (2001) was employed to evaluate vocabulary breadth. The VLT examines the partial lexical knowledge of the learners and estimates their vocabulary size across four frequency levels of 2000, 3000, 5000, and

10000. This test is accepted as an appropriate test of vocabulary breadth, and its different levels have been used by many researchers (Akbarian, 2010; Dabbagh & Janebi Enayat, 2019). The internal consistency of this test examined using Cronbach's alpha method is above .9 (Schmitt et al. 2001).

Each level of VLT includes 10 blocks with 30 items per level. Each block includes 3 target words, 3 distractors on the left column, along 3 definitions on the right column. Each correct response would take one point, with a maximum of thirty per level. The levels test is economical, practical, quick, and easy to score (Schmitt, et al. 2001). The time assigned to this test was 30 minutes.

### **3.3.3. Word Associate Test (WAT)**

The WAT (Read, 1995) was used to evaluate the vocabulary depth. As reported by Read (1995), the test's internal reliability measured through Cronbach's alpha method is .93. Each of the 40 items on this exam, which comes from a higher frequency corpus of the University Word List, consists of two boxes with four words each and a stimulus word, which is an adjective. The test taker is required to identify two related words from each box, selecting a total of four responses. For example, *sudden* is meant to be associated with *surprising* and *quick* in an item. The time allotted for this test was 30 minutes.

### **3.3.4. Semi-Structured Interview Guide**

A semi-structured interview guide was used to collect qualitative data. This interview consisted of seven open-ended questions and some follow-up questions on EFL students' perceptions and attitudes about the use of extensive reading on EFL classes. The open-ended questions were as follows:

1. How do you think reading should be taught in the classroom?
2. How did you feel about participating in the extensive reading program during this course?
3. What do you think about the approaches practiced in your class?
4. Do you think the approaches used in the class improved your language skills?
5. Did writing help you notice or remember new words more effectively? Can you give an example?
6. What are the weaknesses and strengths of the approaches practiced in your class?
7. What did you like most and least about the extensive reading and writing activities?

### 3.4. Procedure

A quasi-experimental pretest-posttest was used for the quantitative stage of this mixed-methods study. The VLT Version 2, measuring 2000- and 3000-word frequency levels, and WAT were used as both pretests and posttests to measure participants' vocabulary breadth and depth more accurately. The extensive reading treatment consisted of a 14-week course. The class met twice a week for 90-min sessions. The pretest was administered at the outset, and the posttest at the end of the course. Both tests were given during class time. Before the pretest, the learners were given information about the study's general objectives and were assured that their performance would not affect their final course grades. However, they were not informed in advance about the posttest. Furthermore, the participants provided informed consent before data collection.

Extensive reading was integrated into the course as follows: Approximately 28 short English texts were selected from the books *Cover to Cover 2* (Day & Harsch, 2008) and *Cover to Cover 3* (Day & Ono, 2008) for in-class reading. According to the publisher, these books emphasize fluency development and pleasure reading. The texts were designed to be accessible, encouraging the participants to read extensively within their linguistic competence. The reading passages included extracts from the *Oxford Bookworms Library* graded readers and short texts from magazines and newspapers. These readings were brief enough for participants to read two during class. The selection of short texts aimed to maintain the participants' interest in what they read.

Furthermore, a pilot study was conducted to ensure the appropriateness of text difficulty. For vocabulary growth through extensive reading, the texts should have a maximum of 5% unknown words (Laufer, 2017; Nation, 2001). This test checked whether the minimum word knowledge criterion for extensive reading was met. In this study, five of the chosen texts were read by 20 elementary EFL learners who did not take part in the study, and they were instructed to mark any unfamiliar words. The results indicated that most of the participants encountered one unknown word for every fifteen or twenty words on one randomly selected page of each reading text (Wang, 2013). Therefore, the texts were found to be the most appropriate for the extensive reading treatment. Also, eight graded readers from the Oxford Bookworm Series of Stages 2, 3, 4, and 5, each with 700, 1000, 1400, and 1700 headwords respectively, were chosen for them to study at home, one per two weeks. These books were *Alice's Adventures in Wonderland: Stage 2*, *The Jungle Book: Stage 2*, *Tales of Mastery and Imagination: Stage 3*, *The Railway Children: Stage 3*, *The Secret Garden: Stage 3*, *The Scarlet Letter: Stage 4*, *A Tale of*



*Two Cities: Stage 4*, and *Little Dorrit: Stage 5*. These readers were selected because vocabulary was controlled by stage level. This ensured that elementary learners read books in which they were already familiar with 95% of the vocabulary. It also enabled them to deduce the meaning of unknown words by using a dictionary or context clues (Nation, 2001). Stage 1 was excluded because the pilot participants already knew all the words.

The 60 students who agreed to participate in this study were randomly assigned to the three groups: RO, RW, and WO groups. In the RO class, the participants read each short text silently, and they could seek assistance from the teacher after finishing their reading. Before the treatment began, the teacher taught the strategies of lexical inferencing and encouraged the participants to guess the meanings of unfamiliar words while reading. During the treatment, the teacher monitored the participants' reading. After finishing each text, the participants stopped reading, and the teacher answered their questions and then pointed out some cultural issues. The class was conducted in Persian, as is common in Iran when oral communication is not the primary focus. In the RW class, participants read the texts and were instructed to take notes while doing so. Then, they were required to write a summary of the text they had just read. The writing assignment was administered to measure the participants' depth of understanding. Before writing, they were instructed that an effective summary should include the main ideas of the text and be written in one's own words. The extensive RO group and the extensive RW group also studied the eight graded readers as homework (one per week). The extensive RW group was also encouraged to write a short review of the books they had read as their homework. The WO group did not read any text; however, they wrote about the topics that the teacher had chosen for them, and they were also required to write about their topics of interest as homework.

The posttest was conducted one week following the treatment without prior notice. It should be mentioned that to measure vocabulary depth and breadth through extensive reading, participants were not notified that they would be tested on their vocabulary growth. The scores from these two tests (pretest and posttest) were entered into IBM SPSS version 21 for further analysis to address research questions 1, 2, and 3 (i.e., RQ1, RQ2, and RQ3).

The qualitative phase of the study began after the treatment and the administration of the posttest. It aimed to have a deeper understanding of the participants' attitudes towards the integration of extensive reading and writing activities in EFL classes and to explore how these activities may have affected their vocabulary development. To this end, semi-structured interviews were conducted with a group of 15 participants selected purposefully from the three

groups involved in the quantitative phase of the study (Five from RW, five from RO, and five from WO). Participation was voluntary, and pseudonyms were used in reporting the qualitative data. Before conducting the interviews, participants were informed about the purpose of the study and were assured that their responses would be kept confidential. The interview guide (Appendix) included seven open-ended questions with follow-ups. The interviews were conducted in Persian to help participants express their ideas clearly and comfortably. Each interview lasted approximately 10 to 15 minutes, and the responses were audio recorded.

### 3.5. Data Analysis

One-way ANOVA, paired samples t-test, and linear regression were used to address the quantitative research questions using IBM SPSS version 21. The qualitative data were analyzed manually according to Braun and Clark's (2006) six phases of thematic analysis. After the data collection, the interviews were transcribed verbatim, and then they were read several times by the researcher to get a general overview of the data. Data were initially coded and then organized into themes. To enhance credibility, the researchers independently coded the data, compared the resulting codes and themes, and refined them through discussion until consensus was reached.

## 4. Results

### 4.1. Raw and Scaled Scores

Table 1 shows the descriptive statistics of the two tests of VLT and WAT in three groups (RO, RW, and WO) for both pretest and posttest. The raw scores on VLT and WAT were not directly comparable because the maximum possible scores for VLT and WAT were 60 and 160, respectively. Thus, the comparison of the raw scores of these two tests was illogical. Thus, to make a better comparison of VLT and WAT, the raw scores were converted to a scale ranging from 0 to 100.

**Table 1**

*Means and Standard Deviations for Pretest and Posttest Scores on WAT and VLT by Group*

Group	Test	Pretest M	Pretest SD	Posttest M	Posttest SD
RO	WAT	50.55	9.49	78.80	13.13
	VLT	23.05	6.13	33.15	7.44
RW	WAT	51.65	10.83	87.15	13.39
	VLT	22.55	6.36	35.75	9.14
WO	WAT	52.55	13.52	58.85	12.10
	VLT	23.90	6.67	25.85	6.15

The descriptive statistics in Table 2 provide the participants' performance.

**Table 2**

*Means and Standard Deviations for Pretest and Posttest Scores on WAT and VLT by Group*

Group	Test	Pretest M	Pretest SD	Posttest M	Posttest SD
RO	WAT	31.59	5.93	49.25	8.20
	VLT	38.42	10.22	55.25	12.40
RW	WAT	32.28	6.77	54.47	8.37
	VLT	37.58	10.60	59.58	15.24
WO	WAT	32.84	8.45	36.78	7.56
	VLT	39.83	11.12	43.08	10.25

As shown in Table 2, the means and standard deviations of pretest and posttest scores on the WAT and VLT for each group (RO, RW, WO). Across all groups, participants generally scored higher on the VLT than on the WAT at both pretest and posttest. In the RO group, the mean VLT score increased from 38.42 ( $SD = 10.22$ ) at pretest to 55.25 ( $SD = 12.40$ ) at posttest, while the WAT scores increased from 31.59 ( $SD = 5.93$ ) to 49.25 ( $SD = 8.20$ ). A similar pattern was observed in the RW group, with VLT scores rising from 37.58 ( $SD = 10.60$ ) to 59.58 ( $SD = 15.24$ ) and WAT scores increasing from 32.28 ( $SD = 6.77$ ) to 54.47 ( $SD = 8.37$ ). In the WO group, VLT scores increased from 39.83 ( $SD = 11.12$ ) to 43.08 ( $SD = 10.25$ ), whereas WAT scores rose from 32.84 ( $SD = 8.45$ ) to 36.78 ( $SD = 7.56$ ). Overall, the participants had a better performance on the VLT. Considering the nature of WAT and VLT, these results are logical because WAT is more difficult than VLT and it needs a deeper processing of words.

#### 4.2. Results for the First Research Question

It should be mentioned that all the statistical analyses in this study were done on scaled scores. To address the first research question regarding the effectiveness of the three methods in improving vocabulary depth and breadth, a paired samples t-test was conducted. This test was used to statistically determine whether vocabulary knowledge, in terms of depth and breadth, was improved by the treatment. To evaluate the effectiveness of each method in enhancing vocabulary knowledge, the mean difference between the pretest and the posttest was compared. For instance, the mean of the VLT on the pretest for the RW group was compared with the corresponding mean of the VLT on the posttest. Consequently, six paired-samples t-tests were conducted at a 95% significance level ( $\alpha = 0.05$ ). Table 3 presents the results of the six t-test paired-samples t-test.

**Table 3***Paired-Samples t-Test Results for Pretest and Posttest Scores on WAT and VLT by Group*

Group	Test	df	Observed $t$	Critical $t$ ( $\alpha = .05$ , two-tailed)
RO	WAT	35	-7.80	$\pm 2.03$
	VLT	37	-4.68	$\pm 2.02$
RW	WAT	36	-9.22	$\pm 2.03$
	VLT	34	-5.30	$\pm 2.03$
WO	WAT	38	-1.55	$\pm 2.02$
	VLT	38	-0.96	$\pm 2.02$

According to the results of t-tests, the means of the scores in RO and RW were significantly different, while the means of the scores related to WO were not significant. For the RO group, significant improvements were found for both the WAT,  $t(35) = -7.80$ ,  $p < .001$ , and the VLT,  $t(37) = -4.68$ , exceeding the critical values of  $\pm 2.03$  and  $\pm 2.03$ , respectively. Similarly, the RW group demonstrated significant gains on the WAT,  $t(36) = -9.22$ ,  $p < .001$ , and the VLT,  $t(34) = -5.30$ , both greater in magnitude than the corresponding critical values of  $\pm 2.03$  and  $\pm 2.03$ . In contrast, the WO group showed no significant differences between pretest and posttest scores for either the WAT,  $t(38) = -1.55$ ,  $p > .05$ , or the VLT,  $t(38) = -0.96$ ,  $p > .05$ , as these observed values did not exceed the critical value of  $\pm 2.02$ . In other words, the teaching methods in RO and RW had caused the participants' depth and breadth of vocabulary knowledge to change significantly, while the vocabulary knowledge of WO had not been significantly improved. Therefore, it can be concluded that the methods of RO and RW were more successful than WO in enhancing participants' vocabulary depth and breadth.

### 4.3. Results for the Second Research Question

To address the second research question of the study, a one-way analysis of variance (ANOVA) was conducted. Four ANOVA tests were conducted in this study, corresponding to the pretest and posttest scores on the VLT and WAT. Because the homogeneity of variances is a necessary condition for an ANOVA test, the results have been presented in Table 4.

**Table 4***Levene's Test of Equality of Variances for Pretest and Posttest Scores on WAT and VLT*

Test	Levene's Statistic	df1	df2	$p$
Pretest WAT	1.00	2	57	.37
Posttest WAT	0.06	2	57	.93
Pretest VLT	0.09	2	57	.91
Posttest VLT	0.51	2	57	.59

As presented in Table 4, the results of Levene's test of homogeneity of variances were nonsignificant for pretest WAT,  $F(2, 57) = 1.00, p = .37$ ; posttest WAT,  $F(2, 57) = 0.07, p = .93$ ; pretest VLT,  $F(2, 57) = 0.09, p = .91$ ; and posttest VLT,  $F(2, 57) = 0.52, p = .59$ . These results confirmed that the homogeneity of variances assumption was met for all ANOVAs. The results of the ANOVA tests are shown in Table 5.

**Table 5**

*One-Way ANOVA Results for Pretest and Posttest Scores on WAT and VLT*

Test	Source	SS	df	MS	<i>F</i>	<i>p</i>
Pretest WAT	Between Groups	15.67	2	7.83	0.15	.85
	Within Groups	2896.27	57	50.81		
	Total	2911.94	59			
Posttest WAT	Between Groups	3303.68	2	1651.84	25.45	.000
	Within Groups	3698.55	57	64.88		
	Total	7002.24	59			
Pretest VLT	Between Groups	51.76	2	25.88	0.22	.79
	Within Groups	6471.40	57	113.53		
	Total	6523.16	59			
Posttest VLT	Between Groups	2927.03	2	1463.51	8.94	.000
	Within Groups	9330.14	57	163.68		
	Total	12257.17	59			

As shown in Table 5, no significant differences were found among the groups on the pretest before treatment for either the WAT,  $F(2, 57) = 0.15, p = .85$ , or the VLT,  $F(2, 57) = 0.22, p = .79$ . However, significant differences emerged on the posttest. For the WAT, there was a significant effect of instructional method,  $F(2, 57) = 25.45, p < .001$ , and a significant effect was also observed for the VLT,  $F(2, 57) = 8.94, p < .001$ . Hence, RW was the most effective in improving Iranian EFL learners' vocabulary depth and breadth. Post hoc comparisons using Tukey's HSD test were run (Table 6).

**Table 6**

*Tukey HSD Post Hoc Comparisons of Posttest WAT and VLT Scores by Instructional Method*

Test	Comparison	Mean Difference	<i>p</i>
WAT	RW – RO	5.22	<.001
	RW – WO	17.69	<.001
	RO – WO	12.47	<.001
VLT	RW – RO	4.33	.03
	RW – WO	16.50	<.001
	RO – WO	12.17	<.001

As indicated in Table 6, for the WAT, the RW group scored significantly higher than both the RO group ( $p < .001$ ), and the WO group ( $p < .001$ ). The RO group also scored significantly higher than the WO group ( $p < .001$ ). These results indicate that RW was the most effective method for enhancing vocabulary breadth, followed by RO, while WO was the least effective. For the VLT, the RW group scored significantly higher than both the RO group ( $p < .05$ ), and the WO group ( $p < .001$ ). The RO group also scored significantly higher than the WO group ( $p < .001$ ). These findings suggest that RW was the most effective method for improving vocabulary depth, with RO also showing moderate effectiveness, while WO showed the least improvement. Table 7 presents the percentage and number of vocabulary gains across the three instructional methods.

**Table 7**

*The percentage and the number of vocabulary gains by the three methods*

Group	WAT Percent	WAT Number	VLT Percent	VLT Number
RO	17.66%	7	16.83%	11
RW	22.19%	9	22.00%	13
WO	3.94%	2	3.25%	2

In this study, the improvement in learners' knowledge of vocabulary depth and breadth in the RO group was moderate, with an increase of 17% (about 7 more words) in WAT and 16.83% (about 11 more words) in VLT. Conversely, the word learning rate in RW was 22.19% (about 9 more words) for WAT and 22% (about 13 more words) for VLT, indicating a strong word pick-up rate in this group. However, the word pick-up rate in WO was weak, calculated at 3% (about 2 more words) for VLT and 3.25% (about 2 more words) for WAT. These findings indicate that the RW method was the most effective, the RO method moderately effective, and the WO method least effective in enhancing both vocabulary breadth and depth.

#### 4.4. Results for the Third Research Question

To answer the third research question of this study (i.e., Are there any relationships between the vocabulary depth and breadth among Iranian EFL learners?), the parameters of WAT and VLT were assumed as independent and dependent variables, respectively. In other words, the parameters in the scores of VLT were measured based on the variations in the scores of WAT. Because the pretest and the posttest were administered to the three groups, there were six categories in which both VLT and WAT were included. If the correlation coefficient is shown with  $R$ , the determination coefficient with  $R^2$ , and the

linear regression with  $y = \alpha + \beta x$ , then these parameters are shown for six categories in Table 8.

**Table 8**

*Parameters of linear regression, correlation coefficient, and determination coefficient for scaled scores*

Group	Test	$\alpha$	B	R	R <sup>2</sup>
RO	Pretest	-4.99	1.37	0.78	0.64
	Posttest	-7.17	1.27	0.84	0.70
RW	Pretest	-3.36	1.27	0.81	0.66
	Posttest	-28.32	1.61	0.89	0.79
WO	Pretest	4.53	1.07	0.82	0.67
	Posttest	1.93	1.12	0.83	0.68

As shown in Table 8, the pretest for the group of RO, the equation of linear regression is  $y = -4.99 + 1.37x$  and its correlation coefficient equals 0.78. Because this correlation coefficient is positive and close to 1, there is a direct linear relationship between the scores of VLT and WAT in this example. Since the determination coefficient equals 0.64, there is a significant linear correlation at the level of 95% ( $\alpha = 0.05$ ) according to the Pearson Correlation Coefficient. On the other hand, VLT has about 64% variance in WAT and vice versa. This suggests that VLT and WAT overlap each other to a great extent. Hence, there is a significant and strong linear correlation between the scores of WAT and VLT for other groups at the significance level of 95%. It means that by increasing the scores of WAT, the scores of VLT will most likely increase.

#### 4.5. Results for the Fourth Research Question

The analysis of the qualitative data indicated three themes related to the EFL learners' perceptions of the use of extensive reading and writing in EFL classes. The three themes included: enhanced vocabulary knowledge, engagement with the language, and self-regulated learning.

##### Theme 1: Enhanced Vocabulary Knowledge

The interviewees' descriptions of vocabulary learning through exposure and use indicated that the classroom activities of extensive reading and writing were important in improving both the vocabulary depth and breadth. For example, one respondent in the RW group said, "Reading and then writing summaries made me think deeply about the vocabulary. It helped me learn to use the words, not just recognize them" (Ali). This expression illustrates the depth of processing through the dual modality of input- and

output-based learning. The interviewees in the RO group emphasized the role of vocabulary breadth and incidental learning through repeated exposure to the same vocabulary in different texts repeatedly. An interviewee said, “Reading helped me see the same words again and again in different contexts. I remembered them better this way (Mihan).

However, participants in the WO group mentioned the challenges in using words accurately due to limited exposure to new vocabulary and low vocabulary breadth. One participant believed that “Sometimes I wanted to express something, but I couldn’t find the right word. I wasn’t sure if the word I used was correct” (Amir). Hence, they were more aware of the vocabulary gaps and they sought a solution. For example, one interviewee said “While writing, I often realized I didn’t know some words. Then I would check the dictionary to learn them” (Sahar).

## **Theme 2: Engagement with the Language**

Participants across the three groups expressed different levels of language engagement based on the nature of the input and output they experienced. They believed that through extensive reading and writing, they were involved in active processing and use of language in different contexts. Participants in the RW group expressed the highest level of engagement. One respondent said, “When I read the stories and then had to write about them, I felt like I was really using English. Writing made me think more about the words and how to use them correctly” (Shima). This expression shows deep engagement through the input-based and output-based learning, which improves both comprehension and production.

The interviewees in the RO group were primarily engaged with comprehension. However, the absence of output-based activities meant that they had limited opportunities to reinforce vocabulary, leading to a more passive form of engagement. For example, Reza said, “I enjoyed the reading because the stories were interesting, and I tried to understand them deeply. But after reading, I didn’t do anything with the new words, so I sometimes forgot them later” (Reza). The WO interviewees showed irregular engagement. Some participants expressed their enthusiasm about using language in real contexts, but others felt limited due to a lack of sufficient input. One respondent said, “Writing helped me focus on what I already knew, but sometimes I felt stuck because I didn’t have enough new words to express myself.”



### Theme 3: Self-Regulated Learning

Participants had different kinds of self-directed behaviors across the three groups. Participants in the RW group mentioned the highest use of metacognitive strategies like self-monitoring, self-evaluation, self-planning, and cognitive strategies like lexical inferencing, rereading, and the like. For example, one respondent said, “While I’m reading and I do not understand the meanings of some expressions, I go back and reread” (Ziba). Meanwhile, they showed the highest level of motivational strategies like “I enjoyed the reading more, and writing about it made me think harder” (Araz). Meanwhile, the participants in the RO group showed some use of self-regulated learning strategies like rereading, lexical inferencing, checking dictionary, and self-evaluation. However, because they were not required to produce language through writing, their opportunities to monitor and assess their language use were more limited compared to the RW group. For example, Fatemeh said “I liked the reading part, but sometimes I wasn’t sure if I really could use the words correctly”.

On the other hand, participants in the WO group showed situational self-regulation. They were often motivated by an interest in writing specific topics and noticed gaps in their vocabulary knowledge. Meanwhile, they tried to overcome linguistic limitations by looking up words in the dictionary or asking for help. However, because they lacked regular exposure to rich and contextualized input, they had fewer opportunities to expand their vocabulary.

The summary of these themes for the three groups are presented in Table 9.

**Table 9**

*Summary of Learners' Perceptions Across Three Groups Based on Identified Themes*

Theme	RW Group	RO Group	WO Group
Enhanced Vocabulary Knowledge	Strong vocabulary retention and depth through reading and writing	Improved vocabulary knowledge through repeated exposure	Limited vocabulary gain; lacked input for lexical expansion
Engagement with the Language	High engagement due to dual-mode input and output (comprehension + production)	Moderate engagement, focused on comprehension and fluency	Irregular engagement; depended on interest in writing topics
Self-Regulated Learning	High autonomy; learners monitored their reading/writing, used self-evaluation and lexical inferencing strategies	Some autonomy observed, mostly monitoring comprehension and unfamiliar words	Moderate autonomy; learners explored topics of interest in writing but lacked guided input

## 5. Discussion

This explanatory mixed-methods study confirmed that the participants could benefit from a well-designed, integrated extensive reading and writing program. By combining reading and writing activities, EFL learners were given more opportunities to encounter and actively use vocabulary in context. The pretest results of the quantitative study demonstrated that the participants had limited vocabulary knowledge across both dimensions. However, the results of the posttest analysis showed that, among the three methods, the integrated use of reading and summary writing was the most effective in improving the vocabulary depth and breadth of Iranian EFL learners. Among the three groups, the scores of the WAT and VLT of the RW group were the most significant. The scores of the RO group showed less improvement than the RW group; however, these two reading groups outperformed the WO group in both dimensions of vocabulary knowledge. These results align with previous studies, which show that learners who engage in extensive reading experience significantly greater improvements in their vocabulary knowledge than those who do not (e.g., Ateek, 2021; Wang, 2013). Furthermore, the scores of the VLT were higher than those of the WAT in all three groups because the latter test required more cognitive processing of words. This indicates that most new vocabulary should be learned through exposure to comprehensible input in a second or foreign language (Waring & Nation, 2004). Thus, extensive reading can develop learners' sight vocabulary as they frequently encounter words (Pellicer-Sánchez, 2020).

The results of this study showed that the gains in vocabulary depth were positively associated with the gains in vocabulary breadth. It found a strong relationship between the vocabulary depth and breadth. In this respect, the results were consistent with those of Akbarian (2010) and Dagnaw (2023), who determined a strong correlation coefficient between EFL learners' WAT and VLT scores. According to Li and Kirby (2014), the high correlation reflects the idea that vocabulary depth and breadth are two complementary, interrelated aspects of vocabulary knowledge. They suggest that depth and breadth are not separate entities but dimensions of the same construct. Vocabulary depth and breadth enhance each other, and they are learned through extensive exposure to the language.

Thematic analysis of the qualitative data expanded the findings of the quantitative study by providing deeper insight into how extensive reading and writing contributed to learners' vocabulary development. The three themes of enhanced vocabulary knowledge, engagement with the language, and self-regulated learning showed that EFL vocabulary acquisition was enhanced when an input-focused, meaning-based, extensive reading program is coupled

with an output-based, summary writing program. Accordingly, a strategy that combines extensive reading and writing is thought to be an effective option for L2 learners (Liu & Zhang, 2018; Park, 2016; Sintia et al., 2025).

Increased reading improves fluency and word recognition automaticity (Pallathadka et al., 2022). Therefore, repeated exposure to the target language in purposeful activities such as extensive reading increases automaticity in fundamental language processing skills (Soleimani et al., 2022). Likewise, summary writing raises learners' awareness of text organization, providing a strategy for identifying main ideas. The participants in the RW group had to be strategic readers, monitoring their comprehension. They engaged in reading-to-write activities, taking an active role in their learning process (Grabe & Stoller, 2011). The combination of intentionality, growing automaticity, and language production through writing led to substantial improvement in vocabulary knowledge for the RW group. In this study, the reported rates of vocabulary learning for RO, RW, and WO were moderate, strong, and weak, respectively, which aligns with Serrano's (2023) assertion that a sufficient duration (at least one full year) is essential for extensive reading to promote L2 vocabulary development effectively.

## 6. Conclusions and Implications

The results of this study showed that integrated reading and writing activities improved both vocabulary depth and breadth among EFL learners. Students in the RO and RW groups outperformed those in the WO group, with the RW group achieving the greatest improvement. Through extensive reading, which contributes mostly to vocabulary breadth, and writing, which contributes mostly to vocabulary depth, EFL learners can develop both dimensions simultaneously within the foreign language context. The findings support the theoretical view that vocabulary depth and breadth are interrelated components of vocabulary knowledge and need not be taught in isolation (Akbarian, 2010; Gu, 2017).

This study has important implications for EFL teachers, EFL students, and syllabus designers. Teachers should design activities that integrate reading and writing to improve EFL learners' vocabulary knowledge. Hence, the instruction that integrates both input-based and output-based skills is beneficial and should be incorporated into educational programs. Moreover, EFL learners can use active reading strategies such as extensive reading, lexical inferencing, and vocabulary production to improve both the depth and breadth of their vocabulary knowledge. Furthermore, syllabus designers can use this study's findings to integrate reading and writing tasks in syllabi meaningfully and systematically.

This study has several limitations. First, it was conducted on Iranian elementary EFL learners. Hence, there is a need to examine the effectiveness of the instructional methods across EFL learners with different proficiency levels and cultural backgrounds. Additionally, this study focused on short-term vocabulary development and did not examine long-term retention. Longitudinal studies are needed to investigate the lasting impact of integrated reading and writing on vocabulary development. Finally, the study's small sample size may limit the generalizability of the results. Further studies can investigate the effect of integrating extensive reading and writing on different dimensions of vocabulary development by using a larger population.

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