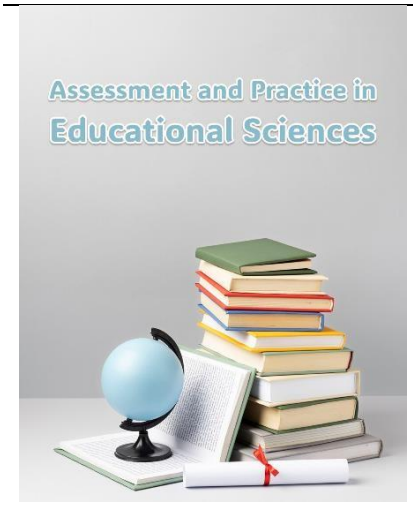
Assessment and Practice in Educational Sciences



The Impact of Convergent and Divergent Tasks on Iranian EFL Learners' Vocabulary Breadth and Depth

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ABSTRACT

Vocabulary knowledge is recognized as a central component of proficiency, influencing learners' performance in reading, writing, listening, and speaking. To this end, the present study aimd at analyzing the significant impact of convergent and divergent tasks have a on the breadth and depth of vocabulary knowledge among 80 Iranian EFL learners, and whether one task type proves more effective than the other in promoting balanced lexical development.Employing a quasi-experimental, pretest–posttest design, two groups received task-based instruction over a ten-session treatment period, after which performance on the post-tests was compared to the pre-test results. The independent variable was the task type (convergent vs. divergent), while the dependent variables were vocabulary breadth – operationalized through the Vocabulary Levels Test (VLT) – and vocabulary depth – assessed through the Word Association Test (WAT). The results of paired-samples t-tests indicated that both the Convergent ($p = .000 < .05$) and Divergent ($p = .000 < .05$) groups showed statistically significant improvments from pre-test to post-test on the Vocabulary Levels Test. The results also revealed statistically significant difference between groups, $t(78) = 3.87$, $p = .000 < .05$, with a large effect size ($d = 0.86$). Learners engaged in Convergent tasks outperformed those in Divergent tasks on the VLT, indicating that the Convergent task structure significantly enhanced vocabulary breadth. Both analyses showed significant ($p = .000 < .05$) differences, indicating that task type had a statistically significant effect on learners' performance in both vocabulary dimensions. The effect size was moderate for breadth ($\eta^2 = .16$) and large for depth ($\eta^2 = .23$), implying that Divergent tasks exerted a stronger influence on the depth of lexical learning, while Convergent tasks had a more modest yet substantial effect on breadth. Running ANOVA analysis, the between-group comparisons showed that convergent tasks were more effective in promoting vocabulary breadth, whereas divergent tasks were more effective in promoting vocabulary depth.Therefore, vocabulary development is optimized when convergent and divergent creativity are balanced, enabling learners to develop both the breadth and depth of lexical knowledge required for flexible and effective language use.

Keywords: ConvergentTask, Divergent Task, Vocabulary Breadth, Vocabulary Depth

Introduction

Vocabulary knowledge has long been recognized as one of the most fundamental dimensions of second language (L2) proficiency because it underpins learners' ability to comprehend, interpret, and produce language across a wide range of communicative contexts. Whether learners engage in reading academic texts, participate in spoken interactions, compose written discourse, or process auditory input, the extent and quality of their lexical knowledge significantly influence their success. Contemporary vocabulary research has increasingly emphasized that vocabulary knowledge is not a unitary construct but rather a multidimensional phenomenon encompassing both vocabulary breadth and vocabulary depth. Vocabulary breadth

refers to the number of words a learner knows, whereas vocabulary depth concerns the quality of lexical knowledge, including semantic associations, collocations, grammatical behavior, and contextual appropriateness (1-4). This distinction has generated considerable scholarly attention because learners may possess knowledge of many lexical items without necessarily understanding their nuanced meanings or appropriate usage. Consequently, successful language instruction must address both dimensions simultaneously to ensure comprehensive lexical development. Research has consistently demonstrated that vocabulary breadth and depth jointly contribute to language proficiency, although each dimension may exert distinct influences on specific linguistic skills. Learners with larger vocabularies generally perform better in reading comprehension and overall language achievement, while those with deeper lexical knowledge often demonstrate superior performance in productive skills and higher-order language processing (1, 5-7).

The significance of vocabulary breadth and depth has been confirmed across numerous empirical investigations conducted in diverse educational settings. Studies have shown that vocabulary breadth serves as a strong predictor of reading comprehension because learners require sufficient lexical coverage to understand texts efficiently. At the same time, vocabulary depth contributes to learners' ability to infer meaning, interpret nuanced language, and establish semantic connections among lexical items. Research examining second language learners has revealed that breadth and depth are complementary rather than competing constructs and that both are essential for effective communication and academic success (8-11). Furthermore, investigations into speaking and writing performance have demonstrated that learners possessing extensive and sophisticated lexical repertoires are better able to express ideas accurately and fluently. Vocabulary size and depth have been identified as significant predictors of oral proficiency and written performance among language learners at various proficiency levels (12, 13). Recent longitudinal analyses have further demonstrated reciprocal relationships among vocabulary breadth, vocabulary depth, and reading comprehension, suggesting that improvement in one dimension can facilitate growth in the others over time (14). Similarly, studies investigating lexical development among beginning and advanced language learners have emphasized that breadth and depth contribute differently to linguistic growth, with breadth often supporting initial comprehension and depth facilitating advanced language use (15, 16). These findings collectively indicate that vocabulary instruction should be designed to promote both dimensions simultaneously rather than focusing exclusively on lexical quantity or quality.

Given the centrality of vocabulary development in language learning, considerable attention has been directed toward identifying instructional approaches capable of fostering meaningful lexical growth. Traditional vocabulary teaching methods have often relied on memorization, word lists, and isolated practice activities. While such approaches may facilitate short-term retention, they frequently fail to promote deep lexical processing or meaningful language use. In response to these limitations, Task-Based Language Teaching (TBLT) has emerged as a prominent pedagogical framework emphasizing authentic communication and purposeful language use. TBLT views language primarily as a tool for communication rather than as an object of study and encourages learners to engage in tasks that resemble real-world communicative activities (17, 18). Within this framework, vocabulary learning occurs naturally as learners interact with language while attempting to achieve meaningful goals. The emphasis on communication, problem-solving, and interaction creates opportunities for repeated exposure to lexical items, negotiation of meaning, and contextualized language use. Contemporary scholarship has increasingly highlighted the value of TBLT for vocabulary instruction because it provides learners with opportunities to encounter, retrieve, and apply lexical items in meaningful contexts rather than through decontextualized exercises (19, 20). Recent evaluations of task-based approaches have also identified numerous strengths related to learner engagement, motivation, and communicative competence development, although researchers have acknowledged the need for careful task design to maximize lexical learning outcomes (21, 22).

The theoretical foundations supporting task-based vocabulary instruction are closely associated with cognitive perspectives on language acquisition. Vocabulary learning is enhanced when learners actively process lexical information, retrieve words from memory, and use them in meaningful communicative situations. Task-based environments provide conditions that promote such processing by requiring learners to focus on both form and meaning simultaneously. Research has shown that vocabulary gains are particularly likely when tasks encourage repeated encounters with lexical items, meaningful interaction, and learner engagement with language forms. Studies examining incidental vocabulary acquisition through input-based and output-based tasks have demonstrated significant lexical gains when learners are cognitively involved in task completion (23). Similarly, investigations into vocabulary learning within task-based environments have reported substantial improvements in learners' lexical knowledge, highlighting the role of task-induced cognitive engagement in vocabulary acquisition (19, 24). Foundational work on vocabulary acquisition has also emphasized the importance of meaningful exposure, repeated retrieval, and contextualized use in facilitating long-term retention of lexical knowledge (25, 26). Consequently, task-based instruction appears particularly well suited to vocabulary development because it creates opportunities for learners to engage with lexical items in ways that support both breadth and depth growth.

Within the broader TBLT framework, researchers have increasingly focused on the characteristics of different task types and their potential effects on language learning outcomes. Two task categories that have attracted considerable attention are convergent tasks and divergent tasks. Convergent tasks require learners to collaborate toward a single correct solution or shared outcome. These tasks typically involve problem-solving, information-gap activities, and consensus-building discussions that encourage learners to negotiate meaning and focus on linguistic accuracy. Because successful task completion depends on arriving at a common answer, learners often engage in repeated lexical retrieval and careful monitoring of language use. Divergent tasks, by contrast, allow multiple acceptable responses and encourage creativity, personal expression, and exploration of alternative perspectives. Such tasks frequently involve brainstorming, open-ended discussions, storytelling, and creative writing activities that require learners to use language flexibly and generate original content (17, 27). The cognitive demands imposed by these task types differ substantially, suggesting that they may influence vocabulary learning in distinct ways. Convergent tasks may be particularly effective for expanding vocabulary breadth because they encourage repeated use and reinforcement of target lexical items, whereas divergent tasks may foster vocabulary depth by promoting elaborative processing, semantic exploration, and contextualized application of vocabulary knowledge (6, 26).

Empirical evidence supporting the pedagogical value of convergent and divergent tasks has accumulated steadily over the past decade. Studies conducted in EFL contexts have shown that both task types can contribute positively to language learning outcomes, although their effects often vary according to the linguistic domain examined. Research investigating reading comprehension has demonstrated that convergent and divergent tasks significantly enhance learners' understanding of texts and overall academic performance (28, 29). Similarly, studies examining writing performance have reported that both task types improve learners' writing quality, although divergent tasks may provide additional benefits by stimulating creativity and idea generation (30, 31). Investigations focusing on oral production have likewise revealed that divergent tasks can enhance complexity and fluency, while convergent tasks promote accuracy and focused language use (32, 33). More recently, research examining idiom acquisition has shown that convergent and divergent tasks can effectively facilitate lexical learning when combined with input-based and output-based instructional approaches (34). Studies comparing the effects of convergent and divergent tasks on reading and writing skills have also suggested that learner characteristics, including gender and individual differences, may influence the relative effectiveness of different task types (35). Despite these promising findings, much of the existing literature has focused on general language performance rather than specifically examining vocabulary breadth and vocabulary depth as separate outcomes.

Another important consideration concerns the relationship between vocabulary knowledge and vocabulary learning strategies. Research has demonstrated that learners employ a variety of strategies to acquire, retain, and use lexical items, and these strategies may influence both vocabulary breadth and depth. Studies examining vocabulary learning strategies have found significant associations between strategic behavior and lexical development, suggesting that instructional approaches should facilitate meaningful engagement with vocabulary rather than mere memorization (36). Moreover, advances in vocabulary assessment have enabled researchers to distinguish more accurately between breadth and depth dimensions of lexical knowledge. Instruments such as the Vocabulary Levels Test and other standardized measures have provided valuable insights into the nature of vocabulary acquisition and have allowed researchers to evaluate the effectiveness of different instructional interventions (2, 3, 5). These methodological developments have highlighted the need for studies that investigate how specific instructional practices contribute to different aspects of vocabulary knowledge. Although previous research has demonstrated the effectiveness of task-based instruction for vocabulary learning, relatively few studies have directly compared convergent and divergent tasks with respect to their influence on vocabulary breadth and vocabulary depth within a single experimental framework. Consequently, an important gap remains in understanding whether different task structures facilitate distinct dimensions of lexical development and whether one task type may be more effective than the other in promoting comprehensive vocabulary growth.

The existing literature therefore suggests several unresolved issues. First, while vocabulary breadth and depth have been established as critical components of language proficiency, the instructional conditions most conducive to developing each dimension remain insufficiently understood. Second, although task-based instruction has demonstrated considerable promise for vocabulary learning, the differential contributions of convergent and divergent tasks to lexical development have not been adequately explored. Third, existing studies have often focused on general vocabulary gains without distinguishing between quantitative and qualitative aspects of lexical knowledge. Addressing these limitations is particularly important in EFL contexts where vocabulary acquisition remains a major challenge for learners seeking communicative competence and academic success. A clearer understanding of how task types influence vocabulary breadth and depth could provide valuable guidance for curriculum design, classroom instruction, and materials development. Therefore, the aim of the present study was to investigate the impact of convergent and divergent tasks on Iranian EFL learners' vocabulary breadth and vocabulary depth and to determine whether one task type is more effective than the other in promoting lexical development.

Methods and Materials

The present study employed a quasi-experimental, pretest–posttest design to investigate the effects of *convergent* and *divergent* task types on Iranian EFL learners' vocabulary breadth and depth. The research design was grounded in the theoretical assumptions of the Involvement Load Hypothesis (37) and Technique Feature Analysis (1), both of which emphasize the role of task-induced cognitive processing in lexical acquisition. The independent variable was the *task type* (convergent vs. divergent), while the dependent variables were *vocabulary breadth* – operationalized through the Vocabulary Levels Test (VLT) – and *vocabulary depth* – assessed through the Word Association Test (WAT).

Both groups received task-based instruction over a ten-session treatment period, after which performance on the post-tests was compared to the pre-test results. The quasi-experimental nature of the study reflected the practical constraints of intact classes, but random assignment of learners to groups helped to reduce selection bias and strengthen internal validity.

A total of 80 Iranian EFL learners participated in the study. They were between 17 and 27 years of age (M = 21.5, SD = 2.4) and were enrolled in intermediate-level courses at a private English language institute in Isfahan, Iran. All participants were native speakers of Persian who had studied English for at least three years.

To ensure comparability, the Oxford Quick Placement Test (OQPT) was administered prior to the treatment. Then, the final participants were randomly assigned to one of two experimental groups of Convergent Task Group (n = 40) and Divergent Task Group (n = 40). Both groups participated in ten sessions of instruction designed to target new lexical items through different task orientations.

The instructional treatments were based on two distinct task types: Convergent tasks and Divergent tasks, each designed to elicit specific types of cognitive and communicative engagement as outlined by Ellis (2011) and Skehan (2001).

Convergent tasks required participants to collaborate and reach a single correct or shared linguistic solution. Such tasks included opinion-gap discussions, reasoning-gap activities, and structured problem-solving exercises. Learners were encouraged to focus on linguistic accuracy, lexical precision, and negotiated meaning, which increased their cognitive involvement and retrieval of target words.

Divergent tasks, in contrast, allowed multiple appropriate responses and encouraged creative and inferential thinking. These tasks included brainstorming, creative writing, decision-making, and word-association activities, where learners used vocabulary in context to generate ideas and express personal viewpoints. The open-ended nature of these tasks emphasized fluency, elaboration, and the integration of lexical knowledge into meaningful discourse.

All tasks were developed in alignment with the five dimensions of Technique Feature Analysis—processing, product, source, learner control, and generativity—and were rated for their Involvement Load (need, search, evaluation). This ensured that both task types represented equivalent cognitive challenge but differed in orientation (accuracy vs. creativity).

Two validated instruments were employed to measure the learners' vocabulary knowledge:

Vocabulary Levels Test (VLT) – Developed by Schmitt et al. (2001), the VLT was used to assess learners' *breadth* of vocabulary knowledge. It measured receptive lexical knowledge across the 2,000- to 5,000-word frequency levels, as well as the academic vocabulary level. The test consisted of matching tasks requiring participants to link words with corresponding meanings.

Word Association Test (WAT) – Originally designed by Read (1993), the WAT was used to assess *depth* of vocabulary knowledge. Each item presented a stimulus word followed by two sets of eight associates—paradigmatic and collocational—requiring learners to identify words that were semantically or collocationally related to the stimulus. This instrument assessed the richness and organization of learners' lexical networks rather than mere recognition.

Both instruments demonstrated high reliability in prior research (VLT α = .92–.96; WAT α = .88–.93) and were adapted slightly for the present study to suit the participants' proficiency level.

The experiment was conducted over a five-week period consisting of ten instructional sessions. Each session lasted approximately 60 minutes and was led by the same instructor to ensure procedural consistency. The procedure followed the sequence outlined below.

During the first session, all participants completed the Vocabulary Levels Test (VLT) and the Word Association Test (WAT). The pre-tests were administered under standardized conditions and were used to establish baseline measures of vocabulary breadth and depth for both groups. At the beginning of the treatment phase, learners in both groups were introduced to the list of target lexical items selected for the course. The instructor briefly presented the items in context, clarified meanings, and provided illustrative examples. This initial presentation was kept identical for the two groups so that any subsequent differences in learning outcomes could be attributed to task type rather than to differences in input.

Over the subsequent eight sessions, the two groups engaged in their respective task-based instructional programs: Learners in this group completed accuracy-oriented tasks designed to elicit repeated use of target vocabulary while working toward a single, shared outcome. Typical activities included opinion-gap discussions with a required consensus, reasoning-gap tasks,

information-gap exercises, and structured problem-solving tasks. In each session, learners first reviewed a subset of target items and then carried out tasks that required them to use these items to reach a solution agreed upon by all group members. The instructor monitored interactions, provided corrective feedback, and encouraged negotiation of meaning to ensure accurate lexical use.

Learners in Divergent Task Group participated in fluency- and creativity-oriented tasks that permitted multiple acceptable responses. Activities included brainstorming, creative writing, open-ended discussions, decision-making tasks, and word-association activities. In each session, learners were encouraged to incorporate the target items into their own ideas, stories, and arguments, thereby using the vocabulary in varied and personally meaningful ways. The instructor emphasized elaboration, extension of ideas, and flexible use of the lexical items rather than strict accuracy.

Across both groups, the same sets of target words were recycled several times during the treatment period; only the task orientation (convergent vs. divergent) differed. This design ensured comparable exposure to the lexical items while manipulating the cognitive and communicative demands of the tasks.

At the end of the tenth session, all participants completed parallel forms of the VLT and WAT. The post-tests were administered under conditions similar to the pre-tests and were used to measure changes in vocabulary breadth and depth following the treatment. All tests were scored by the researcher and independently re-scored by a second rater. Inter-rater reliability exceeded .90 for both instruments, indicating a high level of consistency in scoring.

The collected data were analyzed using SPSS (Version 25). Descriptive statistics (means, standard deviations, and standard errors) were first computed to summarize group performance on both the VLT and WAT. To address the research questions, paired-samples t-tests were conducted to assess within-group differences from pre-test to post-test, while independent-samples t-tests compared post-test means between the Convergent and Divergent groups. A one-way ANOVA was also run to verify between-group effects and to estimate effect sizes (η^2). The level of statistical significance was set at $\alpha = .05$ for all tests.

In addition, the relationships between task characteristics (involvement load and task orientation) and learning outcomes were examined using multiple regression analysis, enabling further exploration of how task-induced cognitive engagement predicted vocabulary breadth and depth.

Although an ANCOVA procedure could also have been employed to control for potential pre-test differences statistically, the combination of t-tests and one-way ANOVA was deemed appropriate given the near-equivalence of the groups at baseline and the primary focus on gain patterns. This methodological choice is acknowledged as a limitation that future research may address by incorporating covariate-adjusted models.

The analytical procedures thus ensured a comprehensive evaluation of the quantitative dimensions of lexical learning resulting from Convergent and Divergent task instruction..

Results and Discussions

Here, it was aimed to analyze the impact of convergent and divergent tasks on Iranian EFL learners' vocabulary breadth and vocabulary depth. The results are organized around the two key dependent variables measured by the Vocabulary Levels Test (VLT) and the Word Association Test (WAT). Each analysis was performed in SPSS (version 25) at a significance level of $\alpha = .05$. Descriptive statistics were first computed to summarize the general performance of the participants in both task conditions. Subsequently, inferential analyses were conducted to determine whether observed differences between pre-test and post-test scores were statistically significant and to evaluate the relative impact of task type on learners' vocabulary development.

Findings and Results

Eighty Iranian EFL learners participated in the study, evenly distributed across two experimental conditions: Convergent tasks (n = 40) and Divergent tasks (n = 40). Both male and female learners were included to ensure a balanced representation of genders and to enhance the generalizability of the findings. The participants' age ranged from 18 to 25 years (M = 21.5, SD = 2.4), and all were enrolled in low-intermediate-level English courses at a private language institute in Isfahan, Iran. Prior to treatment, the Oxford Placement Test (OPT) was administered to verify homogeneity of proficiency levels. The independent-samples *t*-test conducted on OPT scores revealed no statistically significant difference between the two groups (M = 61.75, SD = 4.12 for Convergent; M = 62.33, SD = 4.08 for Divergent; $t(78) = 0.73$, $p = .467 > .05$), confirming that both groups were equivalent in general English proficiency before the experiment.

Table 1. Participants' Demographic Features (N = 80)

Variable	Convergent (n = 40)	Divergent (n = 40)	Total (N = 80)
Gender (M/F)	22 / 18	23 / 17	45 / 35
Age (years) *M* (SD)	21.4 (2.3)	21.6 (2.5)	21.5 (2.4)
OPT score *M* (SD)	61.75 (4.12)	62.33 (4.08)	62.04 (4.10)

Before performing parametric analyses, the assumptions of normality and homogeneity of variance were examined. The Shapiro–Wilk test was used to assess normality, and Levene's test was applied to confirm the equality of variances.

Table 2. Results of Shapiro–Wilk and Levene's Tests for Normality and Homogeneity

Measure	Group	Shapiro–Wilk p	Levene's p	Interpretation
VLT Pre-Test	Convergent	.231	.442	Normal & Homogeneous
VLT Post-Test	Divergent	.194	.378	Normal & Homogeneous
WAT Pre-Test	Convergent	.152	.413	Normal & Homogeneous
WAT Post-Test	Divergent	.169	.329	Normal & Homogeneous

As shown in Table 2, all distributions were approximately normal, and homogeneity of variances was confirmed, with all p-values exceeding .05. Therefore, the data satisfied the assumptions for using parametric tests (t-tests and between-group comparisons).

Also, to ensure that the two groups were equivalent before the treatment, results from the OPT proficiency test were analyzed in Table 3 using an independent-samples t-test.

Table 3. Results of Independent-Samples t-Test for OPT Scores

Group	M	SD	t(78)	p	95% CI (Lower–Upper)	Significance
Convergent	61.75	4.12	0.73	.467	—	Not Significant
Divergent	62.33	4.08				

The results in Table 3 indicated no statistically significant difference between the Convergent (M = 61.75, SD = 4.12) and Divergent (M = 62.33, SD = 4.08) groups, t(78) = 0.73, p = .467 > .05. The two groups were therefore considered homogeneous in initial proficiency.

Indeed, the Mean and standard deviation values for both groups' VLT and WAT pre- and post-tests were calculated and presented in Table 4.

Table 4. Descriptive Statistics for VLT and WAT Pre- and Post-Test Scores by Task Type

Measure	Group	Pre-Test M (SD)	Post-Test M (SD)

VLT	Convergent	78.40 (9.80)	100.90 (11.30)
VLT	Divergent	79.10 (10.10)	93.40 (10.90)
WAT	Convergent	72.10 (10.40)	87.00 (11.60)
WAT	Divergent	71.80 (10.70)	97.70 (12.00)

As presented in Table 4, both groups improved from pre- to post-test on both measures. The Convergent group achieved a mean VLT gain of 22.50 points, whereas the Divergent group achieved a larger WAT gain of 25.90 points. These descriptive results indicate that both task types contributed to vocabulary development, but their effects differed depending on the aspect of lexical knowledge measured.

This section examined whether the observed improvements in vocabulary breadth and depth were statistically significant and whether task type (Convergent vs. Divergent) exerted a measurable influence. Specifically, the analyses explored how convergent and divergent tasks influenced the breadth of vocabulary knowledge among Iranian EFL learners, in what ways these task types affected the depth of vocabulary knowledge, and which task condition proved more effective in enhancing both dimensions of vocabulary learning.

Before performing the inferential analyses, the normality of distribution and homogeneity of variances were examined using the Shapiro–Wilk and Levene's tests, respectively. All p-values exceeded .05, confirming that assumptions for parametric testing were met. Consequently, paired-samples t-tests were used to determine within-group changes from pre-test to post-test, and independent-samples t-tests were employed to compare group means at post-test. Additionally, one-way ANOVA was used as a confirmatory analysis to verify between-group differences. The significance level was set at $\alpha = .05$.

Research Question 1: Vocabulary Breadth (VLT)

To determine the effect of each task type on learners' vocabulary breadth, paired-samples *t*-tests were conducted on the VLT scores.

Table 5. Results of Paired-Samples t-Tests for VLT Scores within Groups

Group	Pre-Test M (SD)	Post-Test M (SD)	Mean Diff.	t(39)	p	Cohen's d	Sig. Decision
Convergent	78.40 (9.80)	100.90 (11.30)	22.50	7.91	.000	1.25	Significant
Divergent	79.10 (10.10)	93.40 (10.90)	14.30	5.65	.000	0.89	Significant

As shown in Table 5, both the Convergent and Divergent groups demonstrated statistically significant from pre-test to post-test on the Vocabulary Levels Test. The Convergent group increased its mean score by 22.50 points, $t(39) = 7.91$, $p = .000 < .05$, Cohen's $d = 1.25$, indicating a large effect size. The Divergent group's mean gain of 14.30 points was also statistically significant, $t(39) = 5.65$, $p = .000 < .05$, Cohen's $d = 0.89$, representing a medium-to-large effect. Although both groups showed improvement, the magnitude of gain was more substantial for the Convergent group, suggesting that convergent task engagement yielded more efficient vocabulary expansion within the same timeframe.

An independent-samples *t*-test was performed to determine whether post-test differences in VLT scores between the two groups were statistically significant.

Table 6. Results of Independent-Samples t-Test for VLT Post-Test Scores between Groups

Group	M	SD	t(78)	p	95% CI (Lower–Upper)	Cohen's d	Sig. Decision
Convergent	100.90	11.30	3.87	.000	3.63 – 11.37	0.86	Significant
Divergent	93.40	10.90					

The results in Table 6 revealed a statistically significant difference between groups, $t(78) = 3.87$, $p = .000 < .05$, with a large effect size ($d = 0.86$). Learners engaged in Convergent tasks outperformed those in Divergent tasks on the VLT, indicating that

the Convergent task structure significantly enhanced vocabulary breadth. This finding supports the assumption of the Involvement Load Hypothesis (ILH) that tasks requiring repeated lexical decision-making and focused attention on linguistic form foster greater vocabulary retention.

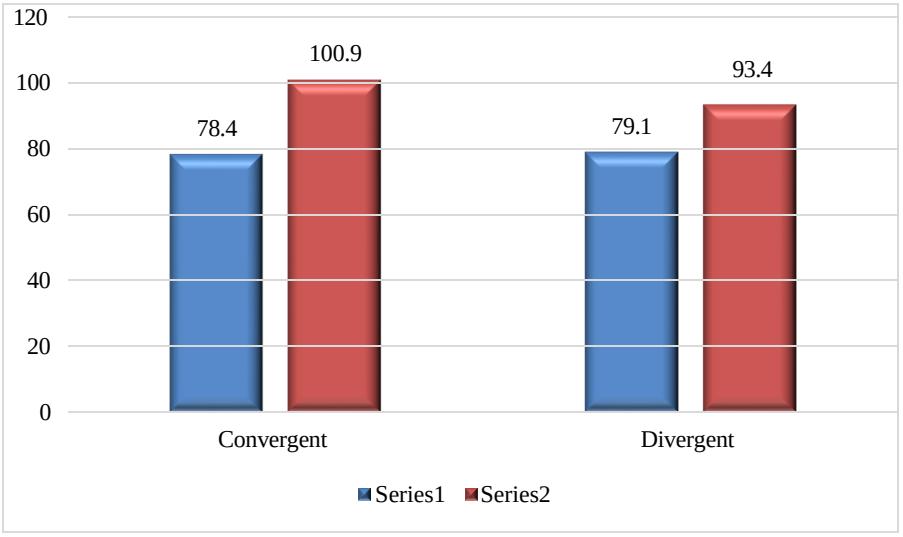


Figure 1. Mean pre- and post-test Vocabulary Levels Test (VLT) scores for Convergent and Divergent task groups

The pattern illustrated in Figure 1 demonstrates a marked rise in post-test means for both groups, with the Convergent group showing a steeper slope of improvement. The broader gains observed in this group highlight that convergence-oriented tasks, emphasizing negotiation of meaning and lexical precision, likely prompted more frequent retrieval and rehearsal cycles—critical components in establishing lexical breadth (Nation et al., 2001).

Research Question 2: Vocabulary Depth (WAT)

To evaluate whether each task type significantly improved participants' depth of vocabulary knowledge, paired-samples *t*-tests were performed on the WAT scores.

Table 7. Results of Paired-Samples t-Tests for WAT Scores within Groups

Group	Pre-Test M (SD)	Post-Test M (SD)	Mean Diff.	t(39)	p	Cohen's d	Sig. Decision
Convergent	72.10 (10.40)	87.00 (11.60)	14.90	5.54	.000	0.88	$p = .000 < .05$
Divergent	71.80 (10.70)	97.70 (12.00)	25.90	9.10	.000	1.44	$p = .000 < .05$

As shown in Table 7, both groups achieved statistically significant gains in WAT performance ($p = .000 < .05$). However, the Divergent group's improvement was almost twice that of the Convergent group. With a mean increase of 25.90 points, $t(39) = 9.10$, $p = .000 < .05$, $d = 1.44$, the effect size for Divergent tasks was notably large, indicating strong within-group advancement in lexical depth. This finding implies that divergent task structures characterized by open-ended language use and creativity – elicitted richer semantic processing and stronger associative links among words (Swan, 2006).

To confirm whether the post-test differences between groups were significant, an independent-samples *t*-test was performed on WAT scores.

Table 8. Results of Independent-Samples t-Test for WAT Post-Test Scores between Groups

Group	M	SD	t(78)	p	95% CI (Lower–Upper)	Cohen's d	Sig. Value
Convergent	87.00	11.60	−4.84	.000	−14.82 – −6.58	1.07	$p = .000 < .05$
Divergent	97.70	12.00					

As displayed in Table 8, the difference between the two task types was statistically significant, $t(78) = -4.84$, $p = .000 < .05$, with a large effect size ($d = 1.07$). Learners engaged in Divergent tasks achieved higher post-test WAT scores (M = 97.70,

SD = 12.00) than those in Convergent tasks (M = 87.00, SD = 11.60), demonstrating that Divergent tasks substantially fostered vocabulary depth.

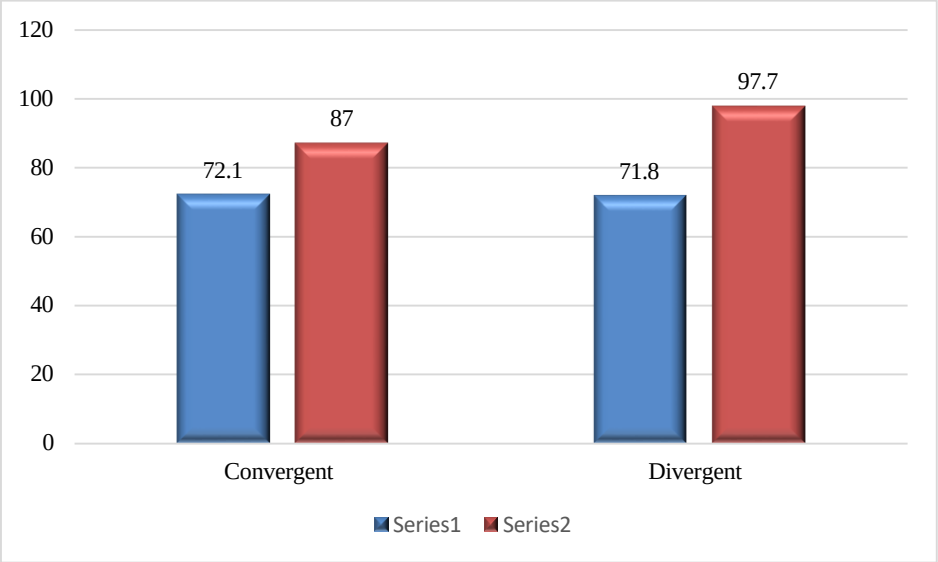


Figure 2. Mean pre- and post-test Word Association Test (WAT) scores for Convergent and Divergent task groups

As illustrated in Figure 2, both groups' mean WAT scores increased after the treatment period, but the Divergent group exhibited a lower gain. The figure visually supports the statistical evidence that creative, problem-solving, and decision-making activities enabled participants to internalize deeper lexical connections, consistent with Schmitt's (2008) view that lexical depth develops through active elaboration and contextual application.

Research Question 3: Comparative Impact of Task Type

To determine which task type proved more effective in enhancing both vocabulary breadth and depth, a one-way ANOVA was conducted using post-test means as the dependent variables and task type as the between-subjects factor.

Table 9. One-Way ANOVA Results for Vocabulary Breadth and Depth Post-Test Scores

Measure	Source	SS	df	MS	F	p	η^2	Sig. Value
VLT	Between Groups	1763.21	1	1763.21	14.98	.000	.16	p = .000 < .05
WAT	Between Groups	2604.44	1	2604.44	23.43	.000	.23	p = .000 < .05

Both analyses showed significant (p = .000 < .05) differences, indicating that task type had a statistically significant effect on learners' performance in both vocabulary dimensions. The effect size was moderate for breadth (η^2 = .16) and large for depth (η^2 = .23), implying that Divergent tasks exerted a stronger influence on the depth of lexical learning, while Convergent tasks had a more modest yet substantial effect on breadth.

Discussion and Conclusion

The findings of the present study demonstrated that both convergent and divergent task types significantly enhanced Iranian EFL learners' vocabulary knowledge, although the nature and magnitude of their effects differed across the two dimensions of lexical competence. The statistical analyses revealed that learners in both groups achieved significant gains from pre-test to post-test in vocabulary breadth and vocabulary depth. However, convergent tasks produced greater improvement in vocabulary breadth, whereas divergent tasks yielded superior gains in vocabulary depth. These findings provide empirical support for the proposition that different task structures activate distinct cognitive and linguistic processes and, consequently, contribute differently to lexical development. More importantly, the results indicate that vocabulary acquisition should not be viewed

solely as the accumulation of lexical items but rather as a multidimensional process involving both quantitative expansion and qualitative enrichment of lexical knowledge. The findings therefore contribute to the growing body of research emphasizing the importance of addressing both breadth and depth dimensions when designing vocabulary instruction (1, 4, 6, 7).

The first major finding of the study was that convergent tasks significantly improved learners' vocabulary breadth. Participants who engaged in convergent activities demonstrated larger gains in vocabulary size than those who participated in divergent tasks. This result can be explained by the characteristics of convergent tasks, which require learners to collaborate toward a single correct solution and repeatedly utilize target lexical items during negotiation and problem-solving processes. Such tasks create multiple opportunities for retrieval, repetition, and reinforcement of vocabulary items, all of which are essential mechanisms for expanding lexical knowledge. According to vocabulary acquisition theory, repeated encounters with lexical items strengthen form–meaning connections and facilitate long-term retention of vocabulary knowledge. Consequently, learners exposed to convergent tasks are likely to acquire a larger number of lexical items because the task structure encourages focused attention on vocabulary use and repeated lexical processing (1, 25). This interpretation is consistent with findings reported by Azimi and colleagues, who demonstrated that convergent tasks significantly enhanced Iranian EFL learners' reading comprehension and lexical development through structured interaction and focused language use (28, 29). Similarly, research investigating speaking performance found that convergent tasks facilitated greater linguistic accuracy because learners concentrated on achieving a common outcome through precise language use (33). The present findings therefore support the notion that convergent tasks create favorable conditions for vocabulary expansion by promoting intensive lexical engagement and repeated retrieval.

The superiority of convergent tasks in fostering vocabulary breadth also aligns with research emphasizing the relationship between lexical size and language performance. Scholars have consistently argued that increasing the number of words learners know is essential for reading comprehension, listening comprehension, and overall language proficiency (8, 9, 11). Vocabulary breadth enables learners to achieve sufficient lexical coverage of texts and communicative situations, thereby facilitating comprehension and participation. Because convergent tasks focus learners' attention on specific lexical items and require accurate usage to complete task objectives, they naturally support the accumulation of lexical knowledge. Furthermore, the structured nature of convergent tasks may reduce cognitive overload, allowing learners to allocate more attentional resources to vocabulary learning. This explanation is compatible with previous task-based vocabulary research demonstrating that focused communicative activities can enhance lexical acquisition by directing learners' attention toward target vocabulary while maintaining meaningful communication (19, 23). Consequently, the current findings reinforce the view that convergent tasks represent an effective instructional tool for increasing learners' vocabulary size.

The second major finding revealed that divergent tasks produced significantly greater gains in vocabulary depth. Learners who participated in divergent activities achieved higher post-test scores on measures assessing semantic associations, collocations, and deeper lexical relationships. This result is theoretically meaningful because divergent tasks encourage creativity, elaboration, and flexible language use. Unlike convergent tasks, which require a single correct answer, divergent activities permit multiple acceptable responses and invite learners to explore language in diverse and personally meaningful ways. Such tasks stimulate deeper cognitive processing by encouraging learners to analyze word meanings, establish semantic relationships, and apply vocabulary across varied contexts. Vocabulary depth develops when learners move beyond simple recognition and begin to understand nuanced meanings, collocations, associations, and contextual constraints of lexical items (6, 26). Therefore, the open-ended nature of divergent tasks appears particularly conducive to developing rich lexical representations and sophisticated word knowledge.

This finding is strongly supported by previous empirical studies. Research examining vocabulary depth has consistently emphasized the importance of elaborative processing and contextualized language use in promoting deeper lexical learning (3, 5). Similarly, Sun and Nam demonstrated that learners with similar vocabulary breadth levels often differed substantially in vocabulary depth, suggesting that qualitative lexical development depends on opportunities for meaningful semantic engagement (16). Divergent tasks provide precisely such opportunities by encouraging learners to generate original ideas, construct narratives, and use vocabulary creatively. The findings also correspond with studies showing that divergent tasks improve writing quality and idea generation because learners must access and manipulate lexical knowledge in flexible ways (30, 31). Likewise, Shoarnaghavi and colleagues reported that divergent tasks enhanced complexity in oral production, indicating that learners engaged in more sophisticated language use when completing open-ended communicative activities (32). The present study extends these findings by demonstrating that the benefits of divergent tasks extend specifically to vocabulary depth, thereby providing further evidence for the importance of creative and meaning-focused language use in lexical development.

Another noteworthy finding was that both task types significantly improved both dimensions of vocabulary knowledge despite their differential strengths. This suggests that vocabulary breadth and depth are interconnected constructs that can develop simultaneously through meaningful language use. Previous studies have repeatedly shown that breadth and depth make complementary contributions to language proficiency and often influence each other reciprocally (10, 12, 13). The reciprocal relationship identified by Wang and Zhang further suggests that improvements in vocabulary breadth may facilitate growth in depth and vice versa (14). The significant gains observed in both groups therefore indicate that task-based instruction generally promotes lexical development regardless of specific task orientation. Nevertheless, the distinct patterns of improvement observed in the present study highlight the importance of considering task characteristics when targeting specific vocabulary learning outcomes.

The findings also provide support for contemporary perspectives on Task-Based Language Teaching. TBLT emphasizes the use of meaningful communication as the primary vehicle for language acquisition and assumes that language learning occurs most effectively when learners focus on achieving communicative goals rather than memorizing linguistic forms (17, 18). The significant vocabulary gains observed across both experimental conditions confirm that meaningful task engagement can facilitate lexical learning. This conclusion is consistent with recent reviews highlighting the effectiveness of TBLT for vocabulary development across diverse educational contexts (20, 21). Moreover, Aramaki reported that task-supported and task-based instruction positively influence learner motivation, which may further enhance vocabulary acquisition by increasing engagement and participation (22). Thus, the current findings contribute to the growing evidence base supporting TBLT as a powerful framework for vocabulary instruction.

The results additionally reinforce the argument that vocabulary instruction should move beyond traditional approaches emphasizing rote memorization and isolated word learning. Vocabulary acquisition is a complex cognitive process requiring repeated exposure, retrieval, contextualized use, and semantic elaboration. Task-based approaches provide opportunities for all of these processes by embedding vocabulary learning within meaningful communication. Previous studies investigating vocabulary learning strategies have emphasized that learners acquire vocabulary more effectively when they actively manipulate lexical items and use them for communicative purposes (36). Likewise, research examining incidental vocabulary learning has shown that lexical gains are enhanced when learners encounter words repeatedly while engaged in meaningful tasks (23). The present findings support these conclusions by demonstrating that both convergent and divergent tasks promote substantial lexical growth through meaningful language use.

From a broader pedagogical perspective, the findings suggest that convergent and divergent tasks should be viewed as complementary rather than competing instructional approaches. Convergent tasks appear particularly effective for expanding vocabulary size and strengthening lexical recognition, whereas divergent tasks excel in developing deeper semantic understanding and flexible language use. Because successful communication requires both extensive vocabulary knowledge and sophisticated understanding of lexical relationships, effective vocabulary instruction should integrate both task types. Such integration would allow learners to benefit simultaneously from the focused lexical reinforcement characteristic of convergent tasks and the elaborative semantic processing encouraged by divergent tasks. This balanced approach is consistent with contemporary conceptualizations of vocabulary knowledge as a multidimensional construct encompassing both breadth and depth (1, 4). Consequently, the study provides valuable evidence supporting the pedagogical value of combining different task orientations to achieve comprehensive lexical development.

One limitation of the present study concerns the relatively limited sample size and the restriction of participants to a single Iranian EFL context. Although the results were statistically significant, the findings may not be fully generalizable to learners from different age groups, proficiency levels, educational settings, or cultural backgrounds. Additionally, the treatment period was relatively short, making it difficult to determine the long-term durability of the observed vocabulary gains. Another limitation is that the study focused exclusively on receptive measures of vocabulary breadth and depth and did not examine productive lexical knowledge.

Future research should investigate the effects of convergent and divergent tasks across different proficiency levels, age groups, and instructional contexts. Longitudinal studies examining vocabulary retention over extended periods would provide valuable insights into the sustainability of task-based lexical gains. Researchers could also explore the interaction between task types and individual learner variables such as motivation, cognitive style, language aptitude, and learning strategies. Furthermore, future studies may incorporate productive vocabulary measures, qualitative data collection methods, and technology-enhanced task environments to provide a more comprehensive understanding of how task characteristics influence lexical development.

The findings suggest several practical implications for language teachers, curriculum designers, and materials developers. Vocabulary instruction should incorporate both convergent and divergent tasks to ensure balanced development of lexical breadth and depth. Teachers can use convergent activities when the instructional objective is vocabulary expansion and accurate lexical usage, while divergent activities may be emphasized when deeper semantic understanding and creative language use are desired. Curriculum developers should design instructional materials that systematically alternate between these task types, enabling learners to experience both focused lexical reinforcement and elaborative semantic engagement. Such an approach can contribute to more comprehensive vocabulary growth and ultimately support learners' overall communicative competence in English.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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