Research Article

On the Relationship of Iranian EFL Learners' Vocabulary Depth with Their Writing Vocabulary Use, Fluency, and Organization

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ARTICLE INFO	ABSTRACT
	Introduction: Recent years have witnessed a growing interest in investigating L2 English productive and receptive vocabulary knowledge in writing. Previous inquiries focused heavily on the pedagogical effects of teaching vocabulary on writing. A less investigated area is learners' lexical competence involvement in the complicated writing process regarding their subcomponents. To bridge the research gap, the present study examined the alleged relationship between the elements of vocabulary depth (collocation and synonym) and the writing skill's subcomponents (vocabulary use, content, and organization). **Methodology:** Thirty intermediate English as a foreign language (EFL) learners' writing scores on the Preliminary English Test were compared and correlated to the depth of vocabulary knowledge (DVK). The writing texts were given a holistic score, and several lexical measures were calculated. **Results:** The results indicated significant relationships between DVK and writing, synonym and vocabulary use, synonym and content, collocation and vocabulary use, and collocation and writing scores. The result of multiple linear regression revealed the double impact of collocation as a predictor of writing scores. **Conclusion:** The findings showed the predictable pedagogical value of practicing collocation in EFL writing enhancement.

1. Introduction

The ultimate goal of learning English is to facilitate communication. There are four primary communicative skills, writing, reading, speaking, and listening, that each learner must master to communicate effectively. However, writing can be the most challenging skill to gain since it requires a wide range of abilities, including spelling, avoiding grammatical errors, ensuring coherence and cohesion, organizing materials, generating ideas, and using a diverse vocabulary and collocations (Yen & Hoai, 2022).

Several pedagogical frameworks have been proposed to help students become effective writers (e.g., Jocius, 2020; Liang & Lim, 2021). English as a foreign language (EFL) students are expected to produce texts that are logically constructed, cohesive, clearly structured, and well-organized (Hall, 1988; Jacobs, 1981), but such writing requires proper language use and a deep understanding of the language (Jashari & Fojkar, 2019). Learners often

encounter several challenges in producing and organizing ideas and translating them into coherent written text, including a limited vocabulary, writing anxiety, a lack of ideas, interference from their mother tongue, grammar difficulties, weak organizational structure, and poor spelling (Jashari & Fojkar, 2019).

Writing can be assessed in different ways; the most common is the direct assessment of writing skills (Wolcott & Legg, 1998). Most direct writing assessments ask students to write in response to a particular topic for a specified time. The topic is introduced at exam time, and the learners are not permitted to check the dictionary or ask for consultations with others (Wolcott & Legg, 1998). In the on-demand/direct assessment, the test takers should provide a well-organized writing piece to meet the face validity. More importantly, the written material must be grammatically and semantically accurate (Wolcott & Legg, 1998). As the

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score reliability issue suggests, scoring writing samples, whether for direct writing assessments or portfolios, is a significant issue that should include both validity and reliability (Wolcott & Legg, 1998).

Holistic, primary trait, and analytic scoring are three types of writing assessment scoring (Wolcott & Legg, 1998). Holistic scoring is based on the premise that the whole is worth more than the sum of its parts; hence, it seeks to focus on an entire piece rather than on its components, and the overall impression is scored instead. In analytic scoring, which is more objective, the writing sample is scored based on different segments of its components, e.g., grammatical accuracy, wording, organization, flavor, usage, punctuation, ideas, spelling, and even handwriting (Wolcott & Legg, 1998). The matter of scoring is a controversial topic among scholars in the field, and the choice is given to the teacher to decide the type of scoring.

To minimize the rater's effect on writing scores, Hughes (2005) proposed a five-analytic scoring rubric (Moon & Hughes, 2005). This rubric included content, organization, vocabulary use, grammar, and mechanics. Hughes' scale is an objective one to provide diagnostic information about the writing. This analytic scoring procedure involves assigning a score for various aspects of a written piece, such as vocabulary, mechanics, and organization. Thus, the impact of each improvement on the writing can be evaluated and analyzed independently.

One of the essential variables scored in the language section of scoring writing assessment is the appropriate use of vocabulary (Elander et al., 2006). Harmon et al. (2009) and Linse (2005) stated that learners' vocabulary development is an essential aspect of their language development. There is consensus among language learners, teachers, and researchers that vocabulary is a fundamental element in the process of learning a language because words are the primary transformers of meaning and thus carry the main information load in communication (Schmidt et al., 2008). The integrated relationship between vocabulary knowledge and language learning has made the researchers investigate more on the importance of vocabulary knowledge in general language ability (Al-Dersi, 2013).

Vocabulary knowledge is defined as the property of lexical competence (Laufer,1998). Lexical competence consists of two dimensions breadth and depth of vocabulary knowledge (Read, 2000). The breadth of vocabulary knowledge refers to one's vocabulary size, the number of words a person knows. However, depth of vocabulary knowledge (DVK) indicates how well a person knows a word or set of words, that is, the quality of the word knowledge (Read, 2000). In addition to having an extensive vocabulary, learners must also know quite a lot about using words in their vocabulary. Deep word knowledge will likely promote the speed and automaticity with which words can be accessed and activated for receptive and productive use (Stæhr, 2018). This means that when teachers are giving explicit focus to the most frequent words in the L2, they should not only concentrate on the form-meaning link of those words but also on other aspects, such as their word parts, collocations, synonyms and register constraints (Nation, 2001).

The DVK can be measured through dimensional and developmental approaches (Read, 2000). The developmental approach follows the developmental mastery of the word knowledge while dimensional tests the learner's familiarity with the meaning of the vocabulary items and their uses (Nation, 2001). To master lexis, language learners need to understand the acquired words deeply in the semantic associations (Nation, 2001). The forms of the learned lexical items are presented in the lexical networks, while their meanings are stored in semantic memory (Traxler, 2012). Semantic memory includes networks of related concepts associated with the words (Collins & Loftus, 1975). According to semantic network theory, the word's meaning pertains to both the immediate meaning of it and its related associations (Collins & Loftus). Semantic network practices (compared to bilingual word lists) were more effective in the depth of vocabulary knowledge, synonyms, and collocations acquisition (Farrokh Alaee, 2022). Some studies indicated that semantic network practices facilitate (e.g., Dowd et al., 2015) or assist (e.g., Prost & Lafourcade, 2011) the second language writing process.

Much research has investigated the relationship between learners' use of vocabulary and the quality of their writing. A general finding is that holistic assessments of EFL learners' written compositions are closely associated with some form of lexical analysis of the writing (Stæhr, 2008). Given that a certain level of vocabulary is required to learn the target language and to produce written work, it can be argued that vocabulary plays a crucial role in writing by allowing for the active use of the language (Karakoç & Köse, 2017).

Hasan and Subekti (2017) investigated the relationship between students' vocabulary mastery and writing descriptive text ability among the seventh-grade students in SMP N 3 Bantul Yogyakarta academic year 2016/2017 applying descriptive and correlational analysis. Multiple choices test was used to find out the students' scores of vocabulary mastery, and an essay test was used to score the students' ability to write a descriptive text. The results revealed a significant positive correlation between vocabulary mastery and writing descriptive text ability.

Karfkan et al. (2022) checked the predictability effect of receptive and productive vocabulary breadth and receptive depth of word knowledge on EFL learners' writing task scores and the vocabulary component of EFL learners' narrative, descriptive, and argumentative writing performance. They administered the Oxford quick placement test to the 70 EFL learners at the upper intermediate level and vocabulary tests of depth and breadth. The regression and correlational results indicated that receptive vocabulary breadth and depth significantly contributed to both overall writing and vocabulary components of narrative, descriptive, and argumentative writing. Moreover, the breadth of productive vocabulary knowledge only correlated with the vocabulary component score and the total score of narrative, descriptive, and argumentative writing. As writing is a complex activity that involves many cognitive processes, any research findings in this area can be beneficial for improving writing skills.

Almost all the research in the field of writing is aimed at improving writing, especially in the field of second/foreign language. However, more research is needed to scrutinize the effective predictable factors in writing. To bridge the gap, the present study examined the alleged relationship between the subcomponents of DVK and writing segments and sought the predictability of each DVK for the percentage variance in writing performance subcomponents.

2. Methodology

2.1. Participants

One of the fundamental criteria in empirical correlational studies is a homogenous sample. To meet the purpose, the Oxford placement test (OPT) was administered to 53 volunteered university students in Mashhad, Khorasan-e-Razavi, Iran. According to Brown (2004), a sample of 10 to 30 participants is adequate for correlational studies. To gather the data from a homogenous sample, 30 participants out of the 53 were selected. They were 15 males and 15 females within the age range of 20 to 30 years old. The participants' levels of English were intermediate based on their obtained scores on OPT. They were studying different university disciplines, and their native language was Persian.

2.2. Instruments

The test instruments used in the study included OPT to check homogeneity, Qian's and Schedl's (2004) Depth of Vocabulary Knowledge Test, and the Standard Test of Writing.

2.2.1. Oxford placement test

The test contains 60 questions in multiple-choice format. It is administered to homogenize the sample under study.

Each item scored 1 point, with no minus point for wrong answers. As OPT is a reliable proficiency test developed by Oxford University Press and Cambridge ESOL, it was used as a placement test to select a homogenous group of participants based on their English levels. This test is a standard test, and its reliability was reported by Oxford University Press website (2001) as high to be used as a placement test. Following the band score divisions, those learners who scored within the band range of 40-47 were selected as the intermediate-level subjects to participate in the present study.

2.2.2. Depth of vocabulary knowledge test

The test instrument was the first two levels of Qian's and Schedl's depth of vocabulary test (2004), a matching recognition vocabulary depth test. Depth of vocabulary knowledge refers to how well words are known. The development of vocabulary depth typically entails acquiring knowledge through encountering and utilizing words in diverse contexts, thereby gaining an understanding of the forms, meanings, and applications of words. Qian and Schedl (2004) have named two aspects of DVK as paradigmatic (synonyms), and syntagmatic (collocations). As a whole, DVK deals with structuring words in the mental lexicon, that is, organization (Meara, 1996). The more organized a person's vocabulary is, the more proficient the learner will be (Read, 2014).

In this example, there are three correct answers on the left and one on the right, but in some other items, there will be either one on the left and three on the right, or two on the left and two on the right (Figure 1). The reliability of the DVK test used in the study was calculated as 0.91.

2.2.3. The Standard Test of Writing

The writing test used in this study was a standardized

Figure 1.
A sample of Depth of Vocabulary Knowledge Test and Its Explanations Adapted from Qian and Schedl (2004, p. 50).

Question 8

- Your English teacher has asked you to write a story.
- Your story must begin with this sentence:

  Tim felt angry as he got off the train.

- Write your **story** in about 100 words on your answer sheet.

Figure 2.
A sample of Preliminary English Writing Test (Hayward, 2021)

test extracted from preliminary English test (PET). The PET is a Cambridge qualification test designed to check the learners' proficiency at preliminary levels (Yaghchi et al., 2016). The writing part of PET (r=.81) includes two parts. Writing part 1 asks the examinees to write a letter answering your friend's questions and writing part 2 involves writing a story. It is scored 25% of the total score for the exam (writing part 1 is marked out of 20 writing part 2 is marked out of 20, too). The 0–5 marks were given for content, communicative achievement, organization, and language (Hayward, 2021; Figure 2).

The extracted test included two parts with three topics on writing. The writing pieces of the participants were scored based on the standard and objective band scores of PET. The reliability as well as the inter-rater reliability of the writing tests used in the study were estimated using Cronbach alpha reliability and reported (r1=.80 and r2=.81, respectively).

2.3. Procedure

After the sampling procedure, the participants (30 EFL learners) took the writing test. They were asked to choose one of the three topics in the test to write. The first topic asked the test-takers to write a story after the first prompting sentence, the second one described a situation and then asked them to write about their opinion, and the third asked them to answer an email message. In the next step, the participants took the DVK test. Then, the written texts were scored by two experts in the field to confirm the interrater reliability (r=.80). The scoring method was analytic scoring procedure; that is, a score is given for different aspects of a piece of writing, such as vocabulary use (effective choice of words and use of idioms and word forms), content (stating the main idea accurately and change of opinion very clear) and organization (coherence and organization of the text) following Moon and Hughes (2005).

The data acquired were put into SPSS (version 27) to be analyzed. Pearson correlation was assigned to find the alleged relationship between the subcomponents of writing test scores (content, vocabulary use, and organization) and the segments of the DVK test (synonyms and collocations).

Since there was a significant correlation between the two main variables in the study (writing and DVK scores) and the Durbin-Watson test confirmed the normality of the data. Multiple linear regression was applied to reveal how much of the writing scores could be explained by the two variables in the DVK, namely synonyms and collocations.

3. Results

3.1. Descriptive statistics

The descriptive statistics of the tests used in the study were analyzed.

Table 1 shows the means, standard deviations, variances, minimum, and maximum for each of the test variables in the study.

3.2. Correlational statistics

The result of Pearson correlation test indicated significant relationships between writing and DVK scores, synonym and content scores, synonym and vocabulary use scores, collocation and vocabulary use scores, and collocation and writing scores (Table 2). Figure 3 shows the scatter plot of the variables in the study.

3.3. Multiple linear regression analyses

Multiple linear regression was used to test if synonym or collocation scores significantly predicted writing scores. Before analyzing the regression models, some preliminary assumptions should be inspected. To check auto correlation in the residuals of a statistical regression analysis Durbin-Watson test was run (Table 3.).

The test reported no autocorrelations (d>2). As Table 1 shows, the model indicated that the independent variables (synonym and collocation) could predict 71.1% of the writing changes. Tolerance was used to assess levels of multicollinearity (Table 4.).

As Table 4 reveals, there was no collinearity between the independent variables (synonyms and collocations). Kolmogorov-Smirnov and Shapiro Wilk tests were run in order to systematically check the normality of the distributions (Table 5.).

The normality of the residuals was confirmed (p > .05). Since all the assumptions of the linear regression were inspected, the model can be assigned to the variables.

Table 1.
Descriptive Statistics for the Tests Used in the Study

|	Placement	writing 1	writing2	vocabulary
Mean	36.36	13.58	12.96	49.90
Median	36.00	14.00	12.75	42.00
Mode	32.00[a]	11.00[a]	11.00[a]	30
Std. Deviation	5.20	2.33	2.66	27.74
Variance	27.13	5.46	7.10	769.95
Range	18.00	7.00	10.50	99
Minimum	30.00	10.00	8.00	10
Maximum	48.00	17.00	18.50	109

Note. a = Multiple modes exist. The smallest value is shown

Table 2.
Correlational Analyses between Depth of Vocabulary Knowledge Subcomponents (Collocation and Synonyms) and Writing Scores (Content, Vocabulary Use, and Organization)

		Correlations						
		Collocation	Synonyms	DVK/ total	Content/ fluency	Vocabulary use	Organization	Writing/ total
Collocation	Pearson Correlation	1	.397*	.970**	.342	.451*	.142	.732**
	Sig. (2-tailed)		.030	.000	.065	.012	.453	.000
	N	30	30	30	30	30	30	30
Synonyms	Pearson Correlation	.397*	1	.608**	.480**	.847**	.202	-.115
	Sig. (2-tailed)	.030		.000	.007	.000	.285	.545
	N	30	30	30	30	30	30	30
DVK/total	Pearson Correlation	.970**	.608**	1	.422*	.614**	.176	.603**
	Sig. (2-tailed)	.000	.000		.020	.000	.351	.000
	N	30	30	30	30	30	30	30
Content/ fluency	Pearson Correlation	.342	.480**	.422*	1	.569**	.278	-.051
	Sig. (2-tailed)	.065	.007	.020		.001	.137	.788
	N	30	30	30	30	30	30	30
***Vocabulary* use**	Pearson Correlation	.451*	.847**	.614**	.569**	1	.365*	-.018
	Sig. (2-tailed)	.012	.000	.000	.001		.047	.923
	N	30	30	30	30	30	30	30
Organization	Pearson Correlation	.142	.202	.176	.278	.365*	1	.114
	Sig. (2-tailed)	.453	.285	.351	.137	.047		.550
	N	30	30	30	30	30	30	30
Writing/total	Pearson Correlation	.732**	-.115	.603**	-.051	-.018	.114	1
	Sig. (2-tailed)	.000	.545	.000	.788	.923	.550	
	N	30	30	30	30	30	30	30

Note. DVK = Depth of vocabulary knowledge
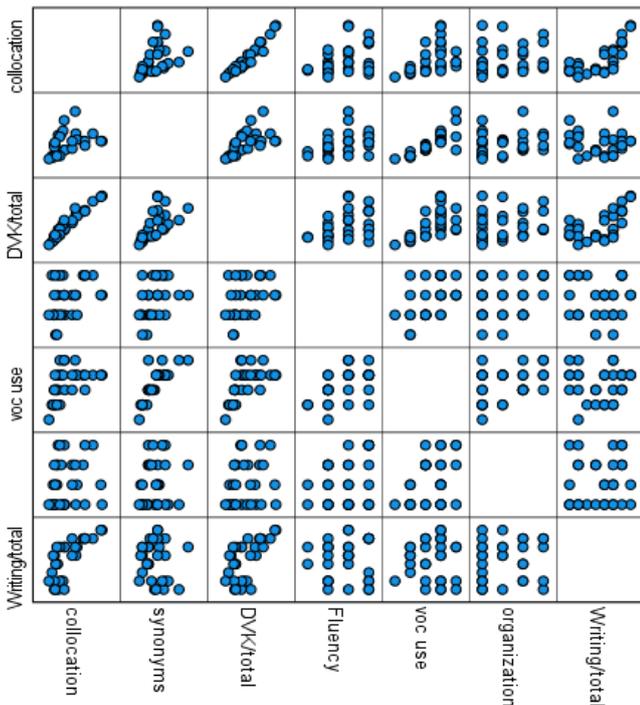
Figure 3.
The Scatter Plot of the Variables

Comparing beta values signified that the synonym score is the first significant predictor of writing scores. The coefficients indicated that the writing score of approximately .154 units was decreased when the synonym

Table 3.
Summary of the Regression

Model	R-squared	Adjusted R-squared	Standard Error of the Estimate	Durbin-Watson
Linear regression	.731	.711	1.2572	2.086

Table 4.
The collinearity Statistics

	Tolerance	VIF
synonyms	.842	1.188
collocation	.842	1.188

Note. VIF = Variance Inflation Factor

score increased; however, the second significant predictor for the dependent variable (writing score) was collocation, which accounted for a .09 unit increase in writing. The results indicated that for writing score prediction, the collocation variable is two times more important than synonym ($\frac{0.923}{|-0.482|} \approx 2$).

Table 5.
Checking the Normality of the Residuals

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.100	30	.200*	.947	30	.142

Table 6.
Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.685	.549		23.101	<0.000
synonyms	-.154	.035	-.482	-4.429	<0.000
collocation	.090	.011	.923	8.484	<0.000

4. Discussion

The inquiry examined the alleged relationship between the elements of writing and the DVK subcomponents. The findings indicated significant relationships between DVK

and writing, synonym and vocabulary use, synonym and content, collocation and vocabulary use, and collocation and writing scores. Considering the significant relationship between writing and DVK scores, multiple linear regression was assigned to check the predictability effect of the independent variables (synonyms and collocations) on the dependent one (writing). Beta values signified that the collocation score is the first and the synonym score is the second significant predictor of writing.

In line with the findings of the current study on the positive relationship between DVK and writing and synonyms and content, Yen and Hoai (2022) found that enhanced use of synonyms and antonyms could improve writing performance. A total of 29 students participated in a 10-week experimental course on synonym and antonym exercises. The results revealed positive attitudes toward the use of synonyms and antonyms in writing, besides improvement in writing performance.

Correspondingly, Dabbagh and Janebi Enayat (2017) applied vocabulary levels test and word associates test to measure receptive vocabulary size and depth and find the alleged relationship between these variables as independent ones and word knowledge in the descriptive writing task as the dependent variable. Their study result revealed that DVK was correlated significantly with L2 learners' writing performance, while Vocabulary Size was merely a predicting factor in the overall score of L2 descriptive writing. Similarly, Johnson et al. (2016) showed that productive word knowledge measured by productive vocabulary level test was passably associated with word choice in L2 writing performance.

Another finding of the study posed the significant relationship between vocabulary use and collocation. Collocation is a term that refers to "the way in which words are used together frequently" (Richard & Schmidt, 2002, p. 81). It deals with the juxtaposition of a particular word with another one, that is, the deep knowledge of the words and their use in the context (Meara, 1996). Collocation refers to structuring words in the context, the more organized the structures, the more proficient a learner is (Read, 2000).

The most striking result from the data is the regression analysis. It suggested the predictive value of collocation in writing performance. Collocation accounted for a .09 unit increase in writing. Earlier studies have shown the confirmed relationship between collocation and writing performance (e.g., Duong & Nguyen, 2021; Thadphoothon & Samrit, 2019). Thadphoothon and Samrit (2019) analyzed sixty-nine short articles written university students and found a significant correlation between collocations and writing ability. Correspondingly, Duong and Nguyen (2021) posed that collocations helped student writers improve language fluency and accuracy in writing and widen lexical knowledge. In line with the present study, Heeyoung and Bae (2012) revealed significant correlations between students' collocation knowledge, reading skills, and writing quality and collocation use.

The analyses of the study identified a significant negative correlation between synonyms and writing performance.

Regression coefficients indicated that the writing score of decreased when the synonym score increased. Since synonyms refer to the number of words relatively with the same meaning, it is the entity of the vocabulary size. As vocabulary size increases, its significance is relatively reduced in favor of quality (Meara, 1996); that is, how well the person knows these vocabularies or the vocabulary depth instead of how many words he/she knows or the vocabulary breadth (Paribakht & Wesche, 1996; Read, 2000).

5. Conclusion

This study explored the contribution of EFL learners' knowledge of vocabulary depth and its components measured by the DVK test (Qian & Schedl, 2004) to their overall writing scores and their content, vocabulary use, and organization scores in writing performance in the writing task. The study's regression findings posed the potentially predictable characteristic of collocation enhancement on writing performance in the foreign language situation. However, the testimony requires more investigation to examine the other elements of writing, such as mechanics and grammar. These results are encouraging and should be validated by a larger sample size. The obtained results highlight the promising role of collocation in writing performance, so EFL teachers are asked to enhance EFL learners' writing performance by encouraging the use of collocations in their writing.

Declarations

Competing interests

The authors declare that there is no known competing financial interests or personal relationships that could have appeared to influence the present work.

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