

A Quantitative Study of the Relationship between Vocabulary and Grammar Mastery and English-to-Indonesian Translation Ability

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Abstract

This quantitative study investigates the extent to which vocabulary and grammar mastery contribute to students' ability to translate English texts into Indonesian. Using a predictive correlational design, the research involved 30 English Education students who had completed a translation course. Data were collected through three instruments: a vocabulary test, a grammar test (each comprising 20 multiple-choice items), and a translation task. Translation outputs were evaluated using an analytic scoring rubric focusing on semantic accuracy. The data were analyzed using multiple linear regression. Results indicated that vocabulary mastery had a significant positive impact on translation performance ($\beta = 0.705$, $p < .001$), whereas grammar mastery showed a weaker and non-significant effect ($\beta = 0.226$, $p = .070$). The regression model accounted for 68.6% of the variance in translation outcomes ($R^2 = 0.686$), suggesting that both vocabulary and grammar are important, with vocabulary emerging as the stronger predictor. These findings highlight the crucial role of vocabulary knowledge in achieving accurate translations. While grammar remains relevant, its contribution was not statistically significant in this study. The results provide useful insights for language instruction, underscoring the need to prioritize vocabulary development in translation training to enhance students' competence in transferring meaning accurately between languages.

Keywords: Vocabulary Mastery; Grammar Mastery; Translation Ability; Predictive Correlation; EFL

INTRODUCTION

In an ideal learning context, mastering English as a foreign language requires students to acquire a strong foundation in vocabulary. Vocabulary is the key to understanding and producing language, as it enables learners to grasp meaning, express ideas, and comprehend texts (Alahmadi & Foltz, 2020a). Without sufficient vocabulary, students will struggle in all four language skills: listening, speaking, reading, and writing. However, in real classroom situations, many learners still demonstrate limited mastery of vocabulary, especially when encountering low-frequency or unfamiliar words. This limitation becomes even more problematic when students attempt to translate, as they often fail to capture the accurate meaning due to gaps in their lexical knowledge (Hariyanto, 2019; Ningrum & Dhewi, 2023). Besides vocabulary, grammar plays an equally important role in achieving language accuracy and fluency. Grammar mastery helps learners structure sentences correctly and express meaning with precision. According to Oktari et al. (2019), grammatical rules guide how ideas are formed and understood in the target language, and poor grammar often leads to mistranslation or distortion of meaning. Unfortunately, many students still commit grammatical errors during translation, indicating a weak grasp of English sentence structures (Nurdin et al., 2024). Rofik (2020) found that common grammatical problems in student translation products include noun phrase formation, subject-verb agreement, tense use, and passive voice. These patterns suggest that despite receiving grammar instruction, students continue to face

challenges in applying grammatical knowledge effectively in real translation tasks. Translation itself is a complex cognitive process that requires the integration of both vocabulary and grammar knowledge. Effective translation is not merely about word-for-word substitution but involves conveying meaning appropriately between two languages. Prior studies have shown a strong correlation between students' vocabulary and grammar mastery and their translation ability (Kurniawan et al., 2021; Ula, 2021). For instance, Ula (2021) found that vocabulary and grammar together accounted for over 80% of the variance in translation performance. Despite these valuable insights, most prior studies have examined vocabulary and grammar in isolation or have not explicitly focused on the direction of translation. Few investigations have assessed how the combination of vocabulary mastery and grammar mastery jointly predicts students' ability to translate specifically from English into Indonesian. To fill this gap, the present study adopts a quantitative approach to analyze both vocabulary and grammar as concurrent predictors of English-to-Indonesian translation ability.

A closer look at recent studies reveals that few have explicitly investigated how vocabulary and grammar mastery jointly affect students' ability to translate from English into Indonesian. Most research either explores general translation competence or uses correlational models focusing on one variable at a time. For example, Pratama et al. (2024) used a correlational design and found a strong relationship ($r = 0.786$) between vocabulary mastery and students' ability to translate English descriptive texts into Indonesian. However, such studies still lack an integrated analysis of both vocabulary and grammar as simultaneous predictors. Yang et al. (2018) emphasized that multiple linear regression is a powerful method for analyzing such complex relationships, allowing researchers to see which linguistic factor has a stronger influence on translation outcomes. Furthermore, Mollaei et al. (2017) revealed that translation tasks are beneficial for promoting students' receptive and productive skills and play a crucial role in facilitating vocabulary comprehension and grammatical understanding in EFL contexts. Despite these insights, there remains a need for direction-specific studies that examine both vocabulary and grammar contributions in combination, particularly in English-to-Indonesian translation tasks.

Therefore, this study aims to quantitatively investigate the relationship between students' vocabulary and grammar mastery and their ability to translate texts from English into Indonesian. By focusing on this specific translation direction and examining the joint contribution of both linguistic components, this research is expected to provide deeper insights into the factors that support translation competence. The findings may contribute to improving translation pedagogy in EFL settings, particularly in helping students strengthen the foundation needed for accurate and fluent translation.

METHOD

This study adopts a quantitative predictive correlational design to examine the relationship between vocabulary and grammar mastery and students' ability to translate texts from English into Indonesian. Correlational research is appropriate for identifying predictive relationships between variables without manipulation, and it serves as a robust foundation for predictive inquiry in educational research (Putri et al., 2025). Within this framework, multiple linear regression analysis is applied to quantify both the unique and combined contributions of vocabulary and grammar mastery to translation performance. As Tuncer & Kuvvetli (2024) emphasized, multiple regression is a powerful statistical technique that enables researchers to determine the relative influence of multiple predictors on a single outcome, particularly in educational and language-based research. This methodological approach aligns with Ula (2021), who reported that vocabulary and grammar together explained over 80% of the variance

in translation performance, confirming the appropriateness of regression analysis for predictive analysis in EFL contexts.

This study involved 30 students of the English Education study program who had taken the Translation course. The purposive sampling technique was used because it allows researchers to select participants who are considered to have experience and basic knowledge in translation activities. According to Arik GÜngör et al. (2022), purposive sampling is used when researchers need participants who meet certain criteria and can provide relevant and specific data to the research problem. A similar approach was used by Ningrum & Dhew (2023) in their study of EFL learners, who revealed the importance of tailoring the sample characteristics to the language context under study.

The instruments used in this study consisted of three types of tests. First, a vocabulary test with 20 multiple choice questions was used to measure participants' lexical mastery, including understanding of synonyms, antonyms, and meaning in the context of sentences. Second, a grammar test with 20 multiple-choice questions was used to measure participants' ability to understand sentence structure, including tenses, clauses, and modals. Each correct answer on the vocabulary and grammar tests was given 1 point, with a maximum raw score of 20 per section. These raw scores were then converted to a 100-point scale for standardization and easier comparison across participants.

Third, the translation ability test required participants to translate a paragraph of English text into Indonesian. The translated texts were evaluated using an analytic scoring rubric that focused on semantic accuracy. Each sentence in the translation output was rated based on a 3 point scale: (3) Accurate, meaning fully conveyed without distortion, (2) Less Accurate, meaning conveyed with some distortion, and (1) Inaccurate, meaning not conveyed or omitted. The total score for translation was calculated by summing the scores for all translated sentences. To standardize the results, the total score was then converted to a scale of 0–100 by comparing the participant's score to the maximum possible score and multiplying by 100. This approach ensured that translation performance was measured objectively and consistently across participants. The data obtained were then analyzed using the IBM SPSS version 29.0 program. The analysis began with the calculation of descriptive statistics to see the distribution of participants' scores, then continued with multiple linear regression analysis to test the simultaneous contribution of vocabulary and grammar to translation ability. This analysis was conducted because, as explained by Yang et al. (2018), multiple linear regression is an appropriate method to predict the value of a variable based on two or more predictor variables. A study by Pratama et al. (2024) also used a similar correlational approach and found that vocabulary mastery was strongly correlated with students' ability to translate English descriptive texts into Indonesian, with a correlation coefficient of $r = 0.786$, indicating a strong relationship between lexical knowledge and translation competence.

RESULTS AND DISCUSSION

Results

This section presents the results of the statistical analyses conducted to investigate the relationship between vocabulary and grammar mastery and English-to-Indonesian translation ability. The analyses include descriptive statistics, assumption testing, and multiple linear regression. Tables are presented first, followed by detailed explanations.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Vocabulary	30	25	100	90.50	14.876

Grammar	30	30	100	69.00	21.391
Translation	30	27	100	87.87	14.299
Valid N (listwise)	30				

The descriptive statistics indicate that among 30 participants, vocabulary scores ranged from 25 to 100, with a mean score of 90.50, suggesting a generally high level of vocabulary mastery. Grammar scores showed greater variability, ranging from 30 to 100 with a mean score of 69.00, reflecting a more moderate level of mastery. Translation scores were similarly high, with a mean of 87.87 and relatively lower variation (SD = 14.30), suggesting that most students performed well in the translation task. The dataset was reviewed for suitability in regression analysis, and the results reported below meet the basic statistical assumptions for interpretation

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.828 ^a	.686	.663	8.306

a. Predictors: (Constant), Grammar, Vocabulary
 b. Dependent Variable: Translation

The model summary indicates a multiple correlation coefficient (R) of 0.828, suggesting a strong positive relationship between the predictors (vocabulary and grammar) and the outcome variable (translation). The R Square value of 0.686 reveals that 68.6% of the variance in translation ability can be explained by vocabulary and grammar mastery. The adjusted R Square (0.663) accounts for the number of predictors and confirms a strong model fit.

Table 3. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4066.557	2	2033.278	29.469	< .001
	Residual	1862.910	27	68.997		
	Total	5929.467	29			

a. Dependent Variable: Translation
 b. Predictors: (Constant), Grammar, Vocabulary

The ANOVA table indicates that the regression model is statistically significant ($F(2, 27) = 29.469, p < .001$), which confirms that the combination of vocabulary and grammar scores significantly predicts translation performance.

Table 4. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.113	9.560		1.685	.103

Vocabulary	.678	.115	.705	5.895	< .001
Grammar	.151	.080	.226	1.886	.070

a. Dependent Variable: Translation

The regression coefficients indicate that vocabulary is a significant predictor of translation ability ($p < .001$), with a standardized beta of 0.705, suggesting a strong positive influence. Grammar, on the other hand, has a standardized beta of 0.226 and a p-value of 0.070, indicating a weaker and marginally non-significant contribution. The constant term is not significant, meaning that in the absence of vocabulary and grammar scores, the model's prediction of translation would not be reliable.

The findings clearly show that both vocabulary and grammar contribute to English-to-Indonesian translation ability, with vocabulary being the dominant predictor. The model explains a substantial proportion of variance (68.6%) in translation scores, reinforcing the importance of vocabulary instruction in EFL translation classrooms. Although grammar contributes to the model, its influence is weaker and not statistically significant at the conventional 0.05 level. These findings align with prior research emphasizing the critical role of vocabulary in translation competence and suggest the need for more targeted grammar interventions to support students' translation performance.

Discussion

The findings of this study provide strong empirical support for the hypothesis that vocabulary mastery significantly contributes to English-to-Indonesian translation ability. The high beta coefficient ($\beta = 0.705$) and a highly significant p-value ($p < .001$) for vocabulary underscore its primary role in supporting semantic comprehension and lexical selection during translation tasks. As Alahmadi & Foltz (2020) also suggest, vocabulary plays a key role in language comprehension and production, arguing that vocabulary size directly influences learners' ability to decode and encode meaning effectively during language processing.

In contrast, grammar, while showing a positive contribution to translation performance ($\beta = 0.226$), did not reach statistical significance in the present model ($p = 0.070$). This finding concurs with Oktari et al. (2019), who found that grammar knowledge facilitates syntactic accuracy but may not be the decisive factor determining translation quality. It implies that grammatical competence alone is insufficient in ensuring high-quality translation, especially when lexical proficiency, which supports accurate word selection and meaning transfer, is paramount. The overall explanatory power of the regression model ($R^2 = 0.686$) aligns with prior research, such as Ula (2021), who demonstrated the combined effect of vocabulary and grammar on translation competence. Our results, however, clarify the differential contribution, highlighting that vocabulary mastery accounts for a substantially larger proportion of variance in translation ability compared to grammar. This emphasis on vocabulary is also pedagogically relevant. Given that translation from English to Indonesian often prioritizes meaning over syntactic structure, vocabulary proficiency enables students to capture and convey accurate semantic content. As such, EFL instructors should emphasize vocabulary development, particularly in specialized and less frequent vocabulary domains. Grammar instruction, while still important, can be targeted more strategically to support sentence cohesion and grammatical accuracy. Future research may consider expanding the sample size for greater generalizability and incorporating qualitative methods to explore learners' cognitive strategies during translation. Moreover, examining bidirectional translation (Indonesian to English and vice versa) could shed light on whether grammar plays a stronger role in L2 productive skills compared to receptive ones.

CONCLUSION

The findings of this study demonstrate that vocabulary mastery plays a significantly more dominant role than grammar in determining students' ability to translate English texts into Indonesian. Although both components contribute to translation competence, only vocabulary showed a statistically significant effect, confirming its central role in ensuring accurate meaning transfer. The regression model revealed that vocabulary and grammar together account for 68.6% of the variance in translation performance, highlighting their combined importance while underscoring the stronger influence of lexical knowledge. In light of these results, EFL translation instruction should place greater emphasis on enriching students' vocabulary, particularly in academic and low-frequency domains, while grammar instruction should be strategically aligned to enhance sentence-level clarity. This study contributes to the growing body of research emphasizing the lexical foundation of translation skills and provides empirical evidence for more targeted pedagogical interventions. Strengthening vocabulary mastery can not only improve translation accuracy but also enhance EFL learners' ability to communicate meaningfully and confidently in cross-linguistic contexts.

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