

Vocabulary and Comprehension: Examining the Lexicon of Selected Tertiary Students in Reading Proficiency

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ABSTRACT - This study examined the relationship between vocabulary size and depth to the reading comprehension of tertiary students. The respondents included 36 first-year students who were enrolled in an education program for the academic year 2023-2024. Data collection involved a vocabulary size test, a word associate test, and a reading comprehension test, which were designed to measure students' vocabulary size, vocabulary depth, and reading comprehension skills, respectively. The mean percentage scores were computed to determine the respondents' level of vocabulary size, depth, and reading comprehension. The Pearson correlation coefficient was computed to examine the relationship between vocabulary and comprehension. Results indicated a significant positive correlation between vocabulary size and reading comprehension, as well as between vocabulary depth and reading comprehension. The findings suggest that when students have both wide vocabulary skills and a depth of vocabulary knowledge, they can also have strong reading comprehension skills. Additionally, the findings highlight that vocabulary size and depth are strong predictors of the student's reading comprehension performance. This study also underscores the need to include teaching and enhancing students' vocabulary skills to improve reading comprehension skills.

INTRODUCTION

The English language, with its vast vocabulary and intricate nuances, forms the foundation of communication. It is a critical measure of proficiency, revealing not only a person's grasp of words but also their ability to navigate the complexities of expression and understanding. English has been widely used and practiced in academic settings and foreign language workplaces. There is no doubt that the English language is playing a crucial role not just in these settings but also in technology, businesses, and global communications (Rahim 2017; Tran Ngoc Duc and Nguyen Thi Lan 2023). It has been determined that reading in English and vocabulary knowledge of learners of English as a foreign language and second language are directly related to each other, and was widely acknowledged that vocabulary knowledge is a significant predictor of learners' language proficiency (Şen and Kuleli 2015; Nguyen and Kim 2021; Alfatihah and Tyas 2022; Cain and Oakhill 2014).

In this study, vocabulary knowledge is conceptualized as a multidimensional construct comprising vocabulary size (breadth) and vocabulary depth, distinguishing the number of words learners know from the quality of their lexical knowledge (Qian, 2002; Schmitt, 2014; Tran et al., 2020; Koizumi & In'nami, 2020). Vocabulary size refers to the number of lexical items for which learners have established basic form-meaning connections, whereas vocabulary depth reflects how well those words are known, including knowledge of multiple meanings, morphological forms, collocations, syntactic behavior, and appropriate contextual use (Qian, 2002; Schmitt, 2014; Kremmel & Schmitt, 2016; Koizumi & In'nami,

2020; Read & Dang, 2022; Yanagisawa & Webb, 2019). Reading comprehension is defined as the ability to construct meaning from written texts through the integration of lexical knowledge, linguistic processing, and prior knowledge, consistent with contemporary models of text comprehension (Zhang & Zhang, 2020; McCarthy & McNamara, 2021; Liu & Zhang, 2025). Research on vocabulary size and depth highlights their importance for reading comprehension, yet the specific strength and nature of their relationships remain contested.

Studies across diverse contexts indicate that learners with larger vocabularies and richer lexical knowledge tend to demonstrate stronger reading comprehension, particularly when processing academic or expository texts (Yoshikawa & Kudo, 2014; Fan et al., 2019). At the same time, evidence suggests that depth of vocabulary knowledge may play a distinct role in supporting inferencing and integration processes essential for comprehension (Sio, 2015; Dagnaw, 2023; Green et al., 2023).

However, findings across studies are not fully consistent. Some research reports weak or non-significant relationships between vocabulary knowledge and reading comprehension, particularly when learner proficiency, decoding ability, background knowledge, or task characteristics are controlled for (Kuo & Anderson, 2016; Li, 2017; Prince & Freebody, 2018). These mixed results suggest that while vocabulary knowledge is generally associated with reading comprehension, the strength and nature of this relationship may vary according to learner characteristics, instructional context, and assessment conditions.

Perfetti (2007) emphasizes the lexical quality hypothesis that high-quality lexical representations—words that are well-learned and richly interconnected—are critical for reading comprehension. On the other hand, schema theory highlights the influence of existing knowledge on comprehension (e.g., Rumelhart, 1980). This theory suggests that understanding a text is an interactive process involving the text itself and the reader's prior knowledge, which is organized into abstract frameworks called "schemata." Interpretation operates on the principle that all new information is evaluated against existing schemata. In this process, adjustments are made to integrate previously unaccounted-for information into prior knowledge structures. This principle leads to two processing modes: bottom-up (text-based) and top-down (knowledge-based). When the input recognized through bottom-up processing aligns with the predictions made through top-down processing, comprehension occurs. Together, these theoretical perspectives suggest that reading comprehension depends not only on the number of words learners know (vocabulary size) but also on the quality and depth of their lexical knowledge, which enables efficient integration of word-level information with higher-level meaning construction. Success in learning in higher education solely lies in the skills of reading, writing and comprehension, as these require critical thinking and crucial understanding of the text (Anwar and Sailuddin 2022).

Developing a strong reading comprehension skill is an essential skill that anyone can acquire through a series of training; however, it is also considered a challenging activity for some individuals. Evidence from the Programme for International Student Assessment (PISA), which evaluates students' reading, mathematics, and science competencies, indicates that Filipino students perform poorly in reading comprehension, with the Philippines ranking among the bottom ten countries in the 2022 assessment (Labor, 2024). While these results reflect learning outcomes at the basic education level, they have important implications for higher education, as deficiencies in reading comprehension are likely to persist into tertiary contexts where academic texts are more complex and vocabulary demands are higher. This pattern underscores the need to examine how foundational literacy gaps influence university students' academic performance and highlights the importance of targeted instructional interventions that address reading and vocabulary development beyond basic education.

Existing research consistently recognizes vocabulary knowledge as a key contributor to reading comprehension, linking both vocabulary growth and lexical quality to higher-level comprehension processes and long-term reading outcomes. However, much of this work has examined vocabulary size and vocabulary depth in isolation, focused primarily on early learners or non-Philippine EFL contexts, and yielded mixed evidence regarding their relative and combined predictive power. Consequently, little is known about how these two dimensions of vocabulary knowledge interact in shaping tertiary-level reading comprehension, particularly within the Philippine higher education context, where students encounter increased academic vocabulary demands and linguistic diversity. Addressing these gaps, the present study examines how both vocabulary size and depth relate to the reading comprehension of selected tertiary students, with the aim of generating evidence that can inform vocabulary-focused instructional practices responsive to Filipino learners' needs. Thus, this study investigates the extent to which vocabulary size and vocabulary depth are associated with reading comprehension among selected tertiary students in the Philippines.

METHODS AND MATERIALS

2.1 Research Design

This study employed a correlational-descriptive research design that aims to investigate the relationship between vocabulary size and depth level in reading comprehension of selected tertiary students. Correlational-descriptive design is a research design that examines the relationship between two or more variables by measuring them and determining whether they are related. This design is useful for investigating the strength and direction of the relationship between variables, but it does not establish causation (Rosnow & Rosenthal, 2017).

Respondents of the Study

The respondents in this study were 36 first-year students who were enrolled at the said academic institution in an education program in the academic year 2023-2024. This study was conducted at one of the campuses of a university in Puerto Princesa City, Palawan, Philippines. The university is known for its quality education through quality instruction, extensive research, and extension programs.

2.2 Sampling Techniques

The participants were selected through simple random sampling. Simple random sampling is a widely utilized sampling method in quantitative studies. Simple random sampling is favorable in homogeneous and uniformly selected populations, where all the individuals have an equal opportunity to participate in the study, and the selection process is entirely based on luck (Noor et al., 2022). Thus, to select the sample size from 83 sample populations, the researchers used the lottery method by writing names on a paper and equally picking 36 respondents. The lottery sampling technique is a form of simple random sampling where each member of the population has an equal chance of being selected as a participant, which ensures fairness and minimizes bias (Bhardwaj, 2019).

2.3 Research Instrument

This study used three different tests to measure three important variables in the study: vocabulary size, depth, and reading comprehension. To assess the students' vocabulary size, the Vocabulary Size Test developed by Nation and Beglar (2007) was adapted. The test underwent validation and reliability testing, resulting in a high-reliability score of 0.96, indicating strong validity and consistency. It is a multiple-choice test, comprising 14 sets of vocabulary items, with each set containing 10 representative items. Each item represents 100 words, making each set an assessment of 1000 words with 10 representative items. This Vocabulary Size Test measures knowledge of 14,000 words through 140 items in total.

On the other hand, to measure the students' depth of vocabulary, the Words Associate Test by Read (1998) were adopted and administered. Read (1993) reported a test reliability level of 0.90 for the original version of the test. In the same token, the modified version of the test, as adapted by Qian (1999), demonstrates strong reliability, with Qian (2002) reporting a reliability score of 0.88. This test has 40 stimulus words, which are all adjectives, and are presented in a context-free manner. There are 8 options below each word, in which the test takers have to select four among eight options that closely correspond in meaning to the word.

Lastly, to assess the reading comprehension of the respondents, this study utilized an adapted and modified version of the instrument developed by Magsalin (2023). The modification involved retaining the first three original passages from Magsalin (2023) and adding a three-stanza poem as a fourth passage to diversify the text types. Minor revisions were also made to selected items to improve clarity and alignment with the study's objectives while preserving the original structure of the instrument. The inclusion of varied text types was intended to capture different dimensions of reading comprehension, including literal, inferential, and interpretative understanding.

The final instrument consisted of 25 multiple-choice items categorized by genre: Passage 1 is a school announcement (4 items); Passage 2 is a fictional narrative featuring dialogue (7 items); Passage 3 is an expository text (9 items); and Passage 4 is the added three-stanza poem (5 items). The reading level of the texts/passages was measured using the Flesch Reading Ease formula developed by Rudolph Flesch (<https://readabilityformulas.com/>). The formula calculates readability based on syllables per word and words per sentence, where scores below 60 indicate reading text difficulty, while higher scores indicate easier readability (Table 1).

Although the respondents were tertiary-level students, passages ranging up to 10th-grade level were deemed appropriate given evidence that many education students demonstrate low reading

comprehension levels, with a substantial proportion failing to meet expected standards (Maute, 2026). This range allowed for a diagnostic assessment of comprehension while maintaining sufficient cognitive demand. Consistent with the Input Hypothesis of Krashen (1985), the selected texts were considered appropriate as they provide comprehensible input slightly above student's current proficiency level.

Table 1. Reading text difficulty of passages.

Passages	Score	Grade Level	Age Range	Text Difficulty
1	77	7 th Grade	12-13 years old	Fairly Easy
2	85	6 th Grade	11-12 yrs. old	Easy
3	54	10-12 th Grade	15-18 yrs. old	Fairly Difficult
4	94	5 th Grade	10-11 yrs. old	Very Easy

2.4 Data Gathering Procedure

In collecting the required data from the respondents, the researchers went through different phases of collecting the data. The researchers gathered data on the number of students for sample population and computed the sample size depending on the number of students. The lottery method was used to select the respondents from the sample population. Names of the students were written on a paper, and 36 names were picked as a sample. The testing was done in two sessions since the tests contained 205 total items. Thus, the researchers believed that students might be tired of answering the tests, so there is a high tendency for them not to read the items thoroughly. This leads to the truthfulness of the data because time pressure and information overload might be a problem. So, the researchers decided to conduct the tests in two different sessions: one session for a vocabulary size test with 140 total numbers of items and one for a word associate test, together with a reading comprehension test with 40 and 25 total numbers of items, respectively. The vocabulary size test by Nation and Beglar (2007) was administered first, giving the respondents 90 minutes to answer the questions. The researchers reminded the respondents to carefully answer each item on the test. In addition, the researchers explained the directions on how to answer the test and what is the purpose of administering the test.

Two days after conducting the vocabulary size test, the researchers administered the Word Associate Test by Read (1998) and the Reading Comprehension Test by Magsalin (2023) to measure the students' vocabulary depth and reading comprehension. The researchers explained the nature of the test and the directions for answering it. By doing so, the test takers were reminded to answer the items thoroughly. The same with the Vocabulary Size Test, the respondents were given 90 minutes to answer the Word Associate Test and Reading Comprehension Test: 60 minutes for WAT since the respondents select four words in each stimulus word in every item, and 30 minutes for RCT. After administering the tests and getting their answer sheets, the researchers now went to the next phase, which is the checking of the tests. After getting the results of the tests, the researchers tabulated the results for data analysis.

2.5 Data Analysis

After collecting and tabulating the data, the researchers computed the mean percentage score (MPS) and described it in accordance with the Department of Education Order No. 8. S. 2015. Pearson's correlation coefficients were computed for both vocabulary size and reading comprehension, as well as for vocabulary depth and reading comprehension. By using these data analysis techniques, the researchers gained a comprehensive understanding of the relationship between vocabulary size and vocabulary depth in the reading performance of the selected tertiary-level students.

RESULTS AND DISCUSSION

3.1 Vocabulary Size and Depth and Reading Comprehension Level

The results on the vocabulary size and depth levels of selected tertiary students reveal a clear disparity between the breadth and depth of their word knowledge, indicating uneven development of lexical knowledge among the selected tertiary students. For vocabulary size, most students were rated fairly satisfactory (36%) or did not meet expectations (36%), while only a small percentage achieved outstanding or very satisfactory levels (a combined 12%). This pattern suggests that although some students possess an adequate range of vocabulary, a substantial number demonstrate limited word knowledge. In contrast, vocabulary depth—reflecting students' understanding of word meanings, relationships, and contextual use—shows a more concerning pattern: 75% of students did not meet expectations, and none attained outstanding or very satisfactory levels. Only a minority attained satisfactory (6%) or fairly satisfactory (19%) performance, indicating widespread difficulty in

understanding word meanings, relationships, and appropriate contextual use. Nonetheless, reading comprehension revealed that 97% of students did not meet the expectation. These findings suggest that limited vocabulary depth—more than vocabulary size alone—may pose a critical constraint on tertiary students' ability to comprehend academic texts (Table 2).

Table 2. Vocabulary size and depth level of selected tertiary students (n = 36).

Descriptor	Vocabulary Size <i>F</i> (%)	Vocabulary Depth <i>F</i> (%)	Reading Comprehension <i>F</i> (%)
Outstanding	2(6)	0(0)	0(0)
Very Satisfactory	2(6)	0(0)	0(0)
Satisfactory	6(16)	2(6)	1(3)
Fairly Satisfactory	13(36)	7(19)	0(0)
Did not meet expectations	13(36)	27(75)	35(97)

Note: DepEd Order No. 8 (s. 2015): Outstanding 90 – 100; Very Satisfactory 85 - 89; Satisfactory 80 – 84; Fairly Satisfactory 75 – 79; Did not meet expectations 74 or below.

The findings of this study indicate that tertiary students exhibit low levels of both vocabulary size and depth, with particularly pronounced weaknesses in depth of lexical knowledge. These results have important implications for their reading comprehension and overall academic performance, as vocabulary knowledge—both breadth and depth—is widely recognized as a foundational component of successful literacy development (Qian, 2002; Nation, 2006). Students with limited lexical resources are more likely to struggle with decoding meaning, integrating ideas, and sustaining comprehension when engaging with academic texts.

The limited vocabulary size observed among the respondents suggests difficulty in processing unfamiliar lexical items in higher-education materials. This finding aligns with previous research emphasizing the role of vocabulary breadth in enabling access to academic discourse and supporting comprehension (Nation, 2006; Laufer & Ravenhorst-Kalovski, 2010). However, the present results also reinforce arguments that vocabulary size alone does not fully account for reading proficiency, as learners' ability to use and manipulate lexical knowledge is equally critical (Meara & Milton, 2003).

More notably, the extremely low performance in vocabulary depth highlights a deeper lexical deficit. The absence of high-level performance in depth suggests that students may recognize words superficially but lack the semantic, morphological, and contextual knowledge required for precise interpretation. This finding is consistent with research emphasizing that depth of vocabulary knowledge plays a crucial role in inferencing, meaning integration, and higher-order comprehension processes (Qian, 2002; Schmitt, 2014). In this context, insufficient vocabulary depth likely constrains students' ability to construct meaning from complex academic texts, contributing directly to their poor reading comprehension outcomes.

The extremely low reading comprehension scores—where 97% of students failed—indicate a critical literacy deficit at the tertiary level. This finding aligns with previous research among pre-service teachers in the Philippine context, where a substantial proportion similarly failed to meet expected comprehension standards (Maute, 2026). Students' difficulty in understanding the reading selection may stem from a combination of limited vocabulary knowledge, cognitive overload, insufficient reading strategies, and weak engagement with extended texts, as similarly observed among pre-service teachers who reported challenges in summarizing, connecting ideas, and sustaining comprehension (Maute, 2026). These results are consistent with studies in the Philippine context reporting persistent comprehension difficulties linked to restricted vocabulary and limited critical thinking skills (Idulog et al., 2023; Roque et al., 2023). This suggests that reading challenges observed in basic education may carry over into higher education, where linguistic and cognitive demands intensify.

At the national level, these findings resonate with broader literacy trends. The Philippines' low performance in international assessments, such as PISA 2022 (Labor, 2024), and reports indicating widespread reading difficulties among Filipino learners underscore that the respondents' performance is not an isolated case but part of a systemic literacy issue. Weak reading comprehension at the tertiary level has implications beyond academic achievement, as it is associated with increased attrition, reduced employability, and long-term socioeconomic vulnerability.

Overall, the results indicate that tertiary students' reading difficulties are rooted not merely in limited vocabulary size, but more critically in insufficient depth of lexical knowledge. This underscores the need

for instructional approaches that move beyond word recognition toward richer, context-sensitive vocabulary learning.

3.2 Vocabulary Size and Depth to Reading Comprehension

Correlational analysis revealed statistically significant positive relationships between both dimensions of vocabulary knowledge and reading comprehension. Vocabulary size demonstrated a moderate positive correlation with reading comprehension ($r = 0.413$; $P < 0.012$), indicating that students with larger vocabularies tended to achieve higher comprehension scores. Vocabulary depth showed a stronger positive association with reading comprehension ($r=0.517$; $P < 0.001$), suggesting that deeper lexical knowledge is more strongly related to successful text understanding (Table 3). These results indicate that while vocabulary size contributes to reading comprehension, vocabulary depth may play a more influential role in supporting meaning construction.

Table 3. Relationship of Vocabulary Size and Depth to Reading Comprehension.

	Statistics	Interpretation
Vocabulary Size × Comprehension		
Pearson's r	0.413	Significant positive relationship
P - value	0.012	
Vocabulary Depth × Comprehension		
Pearson's r	0.517	Significant positive relationship
P - value	0.001	

The findings of this study demonstrate a clear and meaningful connection between students' vocabulary knowledge and their reading comprehension performance. Both vocabulary size and vocabulary depth were positively related to reading comprehension, indicating that students with broader and richer lexical knowledge tend to comprehend texts more effectively. However, the generally low performance observed across vocabulary size, vocabulary depth, and reading comprehension (Table 2) suggests that many tertiary students lack the lexical resources required to engage successfully with academic texts. This pattern reflects challenges commonly reported in classroom contexts, where students struggle to construct meaning from written materials due to limited vocabulary and weak reading skills (Anwar and Sailuddin 2022; Andrianatos, 2019; Bergman 2024; Wu et al. 2023).

Previous research consistently identifies vocabulary knowledge as a foundational component of successful language learning. Studies across diverse contexts indicate that learners with larger vocabularies tend to achieve higher levels of reading comprehension, as a wider lexical repertoire facilitates access to textual meaning and supports efficient processing (Fan et al., 2019; Yoshikawa & Kudo, 2014; He & De Ocampo, 2023). Taken together, these findings point to a general pattern in which vocabulary breadth contributes to learners' ability to understand written texts, particularly in academic settings.

At the same time, existing literature underscores the complexity of reading as a cognitive process. Some studies report weak or non-significant relationships between vocabulary size and reading comprehension, suggesting that vocabulary knowledge alone cannot fully account for reading performance (Prince & Freebody, 2018). Factors such as background knowledge, motivation, cognitive load, and reading strategy use also influence how well students make meaning from text. These contrasting findings highlight the importance of viewing vocabulary as a significant, but not exclusive, contributor to reading proficiency.

Beyond vocabulary size, this study highlights the central role of vocabulary depth in reading comprehension. The stronger association observed between vocabulary depth and comprehension suggests that students who possess a deeper understanding of words—recognizing nuances, contextual variations, morphological relationships, and semantic networks—are better equipped to interpret complex texts. This finding supports previous research identifying vocabulary depth as a strong predictor of reading comprehension (Harkio & Pietilä, 2016). When learners understand how words function beyond their basic definitions, they are better prepared to interpret figurative language, recognize subtle shifts in meaning, and engage more critically with written texts.

Taken together, the findings indicate that the respondents' difficulties in reading comprehension are likely rooted not only in limited vocabulary size but more critically in insufficient depth of lexical knowledge. Many students appear to approach academic texts with surface-level word knowledge, which constrains their ability to integrate meaning and sustain comprehension. These challenges may

be further compounded by limited exposure to varied reading materials and insufficient opportunities for deep, meaningful vocabulary engagement in earlier educational experiences.

These results underscore the importance of intentional and context-embedded vocabulary instruction at the tertiary level. Effective vocabulary development involves not only the introduction of new lexical items but also sustained opportunities for learners to analyze word structures, infer meanings from context, and connect new vocabulary to prior knowledge (Ghalebi et al 2020; Ali and Anwar 2021; Alnan and Halim). When combined with consistent and meaningful reading experiences across disciplines, such instructional approaches can help transform passive vocabulary knowledge into active, functional competence.

Strengthening students' vocabulary knowledge, particularly vocabulary depth, therefore, represents a crucial step toward improving reading comprehension and academic engagement in higher education. By integrating vocabulary-focused instruction with strong comprehension practices, educators can better address the lexical and cognitive demands of academic texts and support learners in developing the skills necessary for successful participation in tertiary-level learning.

CONCLUSIONS

This study establishes a significant positive correlation between vocabulary size, vocabulary depth, and reading comprehension among the respondents. The findings indicate that students with limited vocabulary knowledge tend to exhibit weaker reading comprehension skills. In contrary, students with broader vocabulary knowledge and deeper lexical knowledge perform better in comprehending texts across contexts. These results suggest that effective reading comprehension relies not only on the number of words learners know but, more critically, on the depth and quality of their vocabulary knowledge. A strong and well-developed lexical foundation is therefore essential for successful reading comprehension at the tertiary level.

In light of these findings, future research should further examine the complex relationship between vocabulary size, vocabulary depth, and reading comprehension to better understand how these components interact in supporting literacy development. Researchers are encouraged to design and evaluate instructional interventions that simultaneously develop vocabulary breadth and depth, particularly for tertiary students who continue to experience lexical gaps that hinder academic reading performance. Longitudinal studies are also recommended to examine how sustained vocabulary growth influences reading comprehension over time, providing insights into the long-term impact of vocabulary instruction.

In addition, future investigations should include diverse learner populations to determine how linguistic, cultural, and educational backgrounds shape vocabulary–comprehension dynamics. Examining these variables in multilingual and multicultural contexts can enhance understanding of learner variability. Researchers and educators are encouraged to assess the effectiveness of various instructional approaches and vocabulary-enhancement interventions that can meaningfully improve reading comprehension outcomes among tertiary learners.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHORS CONTRIBUTION

AMDG – Writing-Original draft preparation, Data Curation, Conceptualization, Visualization. **AAG** - Writing-Original draft preparation, Data Curation, Conceptualization, Visualization. **KSMM** – Conceptualization, Supervision, Writing-Reviewing and Editing. **JPFM** - Conceptualization, Supervision, Writing-Reviewing and Editing.

AVAILABILITY OF DATA AND MATERIALS

Data available on request from the authors.

DECLARATION OF GENERATIVE AI

During the preparation of this work, the author(s) used Gemini 3 Flash and Grammarly to enhance the clarity of the writing. After using the Gemini 3 Flash and Grammarly, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

ETHIC STATEMENTS

Respondents were asked to participate voluntarily in the study by answering the tests. No coercion was made; they were informed that they could either participate or not; it was their decision, and the researchers would accept it. Their freedom to decline or accept the invitation to participate in the study was valued and respected.

During the data gathering, the researchers provided a safe environment for the test takers to feel comfortable and relaxed. The significance and purpose of the study were explained. Additionally, the information gathered from the respondents remained private and securely kept after the data analysis.

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