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Receptive and Productive Collocational Knowledge, Vocabulary Size, Motivation, and Self-Efficacy in ESL Reading Comprehension

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ABSTRACT

In reading research and pedagogy, it is important to understand the nuances of collocation competence in ESL learners' reading comprehension of English-language learners, investigate the interrelationships, and evaluate the mutual effect. This study aimed to determine the relationship between receptive and productive collocational knowledge, vocabulary size, motivation, and reading comprehension performance of Royal Malaysian Air Force technicians, focusing on the setting of Institute Technology Aerospace (ITAS) in Kedah State in Malaysia. Using a quantitative design, three tests (receptive/productive collocations, vocabulary size) and two questionnaires (motivation, self-efficacy) were administered to 200 technicians studying English reading comprehension courses. These participants were selected through a random probability sampling technique to ensure an unbiased representation of the target population. Data were analysed descriptively and inferentially, conducting correlation and regression analyses. After determining the correlations, three regression models were conceived to evaluate the most contributing variable. The findings revealed that the receptive collocational knowledge of these ESL learners was the most predictive of their reading results, which briefly means that it enhances reading performance. Moreover, all variables had positive and significant correlations with reading performance. In contrast, receptive and productive collocational competence and vocabulary size had higher correlation values than motivation and self-efficacy. The study offers significant theoretical implications for the field of reading research, especially in the Southeast Asian region, and practical implications for teachers, learners, and assessors of ESL reading comprehension.

I. INTRODUCTION

Vocabulary is linguistically the fundamental part of textual comprehension; therefore, related collocational knowledge contributes contribute to semantic nuances in a text. Researchers have also highlighted the crucial role of collocational competence in second-language reading comprehension, enabling learners to process formulaic language structures effectively. This has made it evident that sufficient receptive and productive collocational knowledge is required for reading comprehension (Duong & Nguyen, 2021;

Gablasova et al., 2017). Ma and Lin's (2015) study found that collocational awareness, with various related activities, contributes positively to the output of textual interpretation. The significant role that collocational knowledge plays in quality comprehension has also been recognised by Malaysian education stakeholders (Wu, Halim, & Nordin, 2021). For example, in Malaysia, where English has become the second official language despite Malay being the official language, English proficiency is both a global necessity and a national priority (Zin & Yunos, 2020). As a lingua franca and a bridge tool worldwide, English bridges

divide and unlock access to a global knowledge system (Hultgren, 2019). To become a high-income economy, Malaysia's government is changing English education priorities to increase competitiveness in technology, tourism, and international trade (Afip et al., 2019). Therefore, collocational knowledge is essential for college students, preparing them to succeed in an information-driven world where accurate text interpretation is vital for academic and professional success.

Similarly, university-level Malaysian cadets and technicians are also expected to be able to comprehend moderately complex English texts. Malaysian Armed Forces personnel, in the making, are expected to be ready to communicate globally through skilful communication, including reading (Zin & Nazri, 2021). The Royal Malaysian Air Force (RMAF) includes air force technicians who also study English as a second language at their institutes, and the courses focus on reading comprehension as a crucial part. However, it has been reported (Singh, 2018; Ratnam, 2012) that many learners in these institutes lack sufficient textual comprehension skills in English, in which collocational knowledge deficits, both receptive and productive, are prominent. Specifically, Hong et al. (2011) found that a deficit in *verb-noun* collocational awareness causes a comprehension deficit among Malaysian university-level learners. This has made it evident that sufficient receptive and productive collocational knowledge is required to comprehend the language. Therefore, it is also vital for university students and students from the Royal Malaysia Air Force institutes. Other studies have also found that a lack of collocational knowledge affects reading comprehension skills (Ginanti & Rochman, 2020). Many researchers (Durrant, 2014; Fitriani, 2017; Hsu & Chiu, 2008; Lien, 2003) have claimed that receptive and productive knowledge of English collocations simultaneously affect textual comprehension output because these two aspects of vocabulary are intertwined at several levels. Based on this empirical information, it is not hard to see why the collocational ability of Malaysian university-level learners in English reading comprehension is below expectations compared to other regional ESL contexts such as India, Pakistan, South Korea, and Vietnam. Addressing the systematic collocational knowledge gap through focused research is essential to reduce risks in high-stakes situations, improve technical comprehension, and comply with international aviation standards, given the crucial reliance on English for technical operations and aviation safety. To properly perform their tasks in this information and technology-driven era, Armed Forces personnel must be able to understand textual material, particularly in the form of collocation (Sovhar, 2024). It is essential to address this issue in a broader context beyond academic backgrounds, requiring English proficiency for various operations, understanding manuals, and interacting with global experts and specialists.

Individuals who face linguistic competency challenges or may lack confidence in handling communication tasks often perceive the target language as a significant obstacle. This difficulty in successful language usage and lower performance levels can adversely impact their self-efficacy and motivation. According to some researchers (Chen & Kent, 2020; Seven, 2020; Unrau et al., 2018), low motivation can affect the performance and confidence of learners in executing tasks. Reading comprehension is also a cognitive process in which the learner uses mental processes of interpretation, synthesis, and vocabulary understanding. This creates a nexus of variables that operate together, such as cognitive skills, reading comprehension performance, vocabulary size, collocational knowledge, and motivation (Efriza et al., 2023). For instance, poor collocational knowledge restricts the capacity to identify word partnerships (e.g., "make a decision") and hinders fluent parsing of meaning, while a constrained vocabulary limits text decoding. Cognitive resources are strained by these language barriers, which slow understanding and increase anxiety. On the other hand, students who are more proficient in vocabulary and collocations might feel more confident in themselves, encouraging them to take on challenging texts (Ceprano & Shea, 2017). As a result, self-efficacy and motivation interact dynamically with linguistic competencies to influence learners' access, process, and perseverance in ESL reading tasks rather than functioning independently (Wu et al., 2022). Under specific conditions and circumstances, these aspects may branch into their relational subfactors. Since RMAF is the most important example, it uses English as its primary documentation, training, and instruction medium for its technology and

maintenance. Due to the importance of English proficiency in the RMAF, a more in-depth study is warranted to investigate the role of collocational knowledge in facilitating reading comprehension among learners. This may also be seen in light of the findings of Unrau et al. (2018), who found that intervening in self-efficacy through awareness of training and techniques tends to improve reading comprehension.

The present study investigates how collocational knowledge affects the reading output of Royal Malaysian Air Force technicians, who underperform in their recent vocabulary tests based on the Australian Defence Force English Language Profiling (ADFELPS). Empirical evidence of this inadequacy has been observed in the overall performance of these technicians. As collocational knowledge and skills broadly bifurcate into receptive and productive collocational awareness, this study attempts to determine the relationship between both types of collocational manifestation and reading performance. *Verb-noun* collocations are included in the analysis because of their significance in everyday and academic reading. These forms show the multidimensionality of the role of collocations in a language. Another variable investigated is vocabulary size. This study also evaluates the most contributing role in the learners' textual understanding of these variables. Contributive correlations can explain the variance in the reading ability of Royal Malaysian Air Force technicians beyond the academic setting. This may further assist learners, instructors, curriculum designers, and policymakers in catalysing relevant learning, teaching, and assessment practices.

Researchers have paid considerable attention to collocational knowledge, word frequency, and vocabulary size in the context of reading comprehension and vocabulary development for L2 learners. Scholars like Mueller (2011) emphasise collocational competence as the foundation for L2 proficiency, arguing that it supports reading skills, compensates for semantic gaps, and reflects grammatical and semantic awareness during interlanguage stages. Alderson (2000) corroborates this by noting that vocabulary competence consistently emerges as a critical factor in verbal skill development. Earlier, Horwitz (1988) underscored the recognition of collocations as essential for reading success. The findings and conclusions of these notable researchers highlight the significant role of collocational knowledge and vocabulary size in learning L2 language skills. The current study operates on the same research premise; however, it aimed to investigate collocational knowledge in two forms while integrating three influential elements related to L2 skills: reading self-efficacy, motivation, and vocabulary size. Ma and Lin (2015) conducted a quantitative study on the contributing role of self-efficacy, collocations, vocabulary size, and other relational variables in the variance of reading comprehension outcomes of adult learners in Taiwan. They found that collocational competence affects reading performance through additional variance. Furthermore, vocabulary and collocational knowledge explain most of the variance in reading performance. On the other hand, Yazdandoost, Amalaleh, and Kafipour (2014) performed a study on Iranian EFL learners in which they evaluated the effect of collocational knowledge on the four core language skills (i.e. listening, speaking, reading, and writing). The results showed a significant correlation between reading comprehension and collocational ability ($p = 0.724$), preceded only by speaking skill ($p = 0.885$).

The relationship between collocational competence and reading comprehension remains contentious, with Fitriani (2017) reporting no significant correlation in Indonesian contexts, contrasting earlier studies. Despite the theorised role in second languages, el-Dakhs (2015) highlights a critical research gap. To address these inconsistencies, this study examines how receptive and productive collocational knowledge, along with vocabulary size, influences reading outcomes, positing that lexical proficiency, which encompasses both breadth (quantity) and depth (semantic and inferential nuance), mediates comprehension, as theorised by Perfetti's (2007) on lexical quality hypothesis and Cain and Oakhill's (2014) emphasis on vocabulary quality. Extending Qian's (2002) multidimensional model, which integrates size, depth, lexical organisation, and automatised knowledge, this research underscores collocations as a facet of depth, arguing that their mastery enhances text integration, thereby bridging gaps between fragmented findings and offering a holistic framework to evaluate vocabulary's role in reading proficiency.

Building on Qian's (2002) multidimensional framework, vocabulary size, the first component, has been widely examined as a predictor of reading proficiency, with studies demonstrating its incremental growth in educational stages, as evidenced by Kirmizi's (2014) findings on Turkish EFL learners, whose receptive vocabulary expanded progressively across school grades but plateaued at higher lexical levels (e.g., 10000 words level). This aligns with Cameron's (2002) advocacy for level tests as practical tools to quantify vocabulary breadth. This method is recurrently applied in L2 research, including the study by Kotchana and Tongpoon-Patanasorn (2015) on Thai EFL learners, which revealed a receptive-productive gap mirroring trends in neighbouring Malaysia, where Ibrahim et al. (2013) identified insufficient vocabulary thresholds among pre-university ESL learners, alongside a strong correlation (r = 0.862) between collocational competence and linguistic proficiency. Such findings underscore vocabulary size as a foundational yet insufficient factor, necessitating integration with depth and automaticity, a notion reinforced by Green et al. (2023), who affirmed its robust link to academic reading comprehension. Research highlights vocabulary size as a crucial, though partial, factor in textual comprehension. This supports its role in examining the relationship between collocational knowledge and reading outcomes, especially in contexts like Malaysia, where lexical gaps remain despite regional linguistic connections.

Vocabulary depth and associative awareness have emerged as critical factors in second language (L2) learning, as noted by Webb and Nation (2017). They highlighted that knowledge of word associations supports vocabulary development and enhances text interpretation, which is particularly crucial for university students encountering complex texts. However, much of the existing research has concentrated on native English speakers, creating a gap that the current study addresses within the Malaysian context. Additionally, collocational knowledge has been extensively studied and is recognised as playing a significant role in L2 acquisition. Jeensuk and Sukying (2021) emphasised that a robust collocation foundation enables learners to grasp linguistic features more effectively. As this knowledge becomes embedded, it promotes spontaneous language use, enhancing comprehension and production. Rogers (2024)

argued that it is essential for achieving native-like fluency. Despite its significance, there is limited research on the influence of collocational knowledge on reading comprehension among Malaysian ESL learners.

Studies in various EFL/ESL contexts reveal concerns about learners' deficient receptive and productive collocational knowledge, negatively impacting language skills like reading (Begagi, 2014). Research has also established a significant positive correlation (r = 0.68, p < 0.01) between collocational awareness and reading comprehension (Keshavarz & Salimi, 2007). However, the role of learner motivation and self-efficacy in utilising collocations for comprehension has received insufficient attention (Ma & Lin, 2015). The existing literature includes studies assessing collocational competence and its effects on skills and investigating the relationship between collocational awareness and reading comprehension. While the influence of affective variables like self-efficacy on reading has been noted (Raissi & Roustaei, 2013; Schunk, 2003; Unrau et al., 2018), these are often examined separately from collocational knowledge. Notably, while comprehensive, Qian's (2002) vocabulary association awareness model did not incorporate affective variables. Based on this, the present study aimed to determine the effect of receptive and productive knowledge, vocabulary size, and reading self-efficacy on the reading outcome of Malaysian L2 learners studying in the Royal Malaysian Armed Forces (RMAF) technician colleges.

As highlighted above, reading comprehension is shaped by several key factors: motivation, self-efficacy, vocabulary breadth, and familiarity with collocations. Recognising and addressing these elements is vital for enhancing reading skills. This study, guided by specific research questions, investigates the interplay of motivation, self-efficacy, vocabulary size, and collocational knowledge among learners enrolled in an English language proficiency course at an RMAF training institution.

RQ1: Is there a significant relationship between receptive collocational knowledge, productive collocational knowledge, vocabulary size, motivation, reading self-efficacy, and reading comprehension performance of Royal Malaysian Air Force technicians studying ESL reading

courses?

RQ2: Among receptive collocation knowledge, productive collocational knowledge, vocabulary size, motivation, and reading self-efficacy, which is the most predictive variable for the reading comprehension performance of these Malaysian ESL learners?

RQ3: If motivation and self-efficacy (Model 2 & Model 3, respectively) are added to the regression model of receptive and productive collocational knowledge and vocabulary size (Model 1), which model explains a higher variance in reading comprehension performance?

II. METHOD

Samples

Two hundred undergraduate ESL learners at the Institute of Technology Aerospace (ITAS) in Kedah state were selected through random probability sampling, ensuring an unbiased representation of the target population (Aziz, Hassan & Aljamili, 2024). This strategy allows statistical inferences, and every individual in the population has an equal chance of being selected for the sample. Data for the study were collected from participants who had enrolled in a compulsory course on reading comprehension and other English language skills. The background exposure of these respondents to English reading courses was approximately 10 to 12 years spent in schools. All the students at this institute were male.

Instruments

The study focused on six variables: receptive collocational knowledge, productive collocational knowledge, vocabulary size, motivation, self-efficacy in reading, and reading comprehension performance. Consequently, data for each variable were collected from representative tests: (1) a receptive collocational knowledge test, (2) a productive collocational knowledge test, (3) a vocabulary size test, (4) a motivation questionnaire survey, (5) a reading self-efficacy questionnaire survey, and (6) an English reading comprehension test. In this study, six tools were used to measure the relevant variables. A receptive collocational knowledge test first evaluated participants' ability to identify suitable word combinations in context. Second, a productive collocational knowledge exam assessed their ability to produce precise collocations. Third, the scope of their lexical knowledge was assessed using a vocabulary size test. Fourth, the learners' inner and extrinsic motivation to participate in the acquisition of the English language was recorded by a motivation questionnaire. Fifth, a reading self-efficacy questionnaire assessed participants' confidence in reading skills. Lastly, the outcome measure was an English reading comprehension test that assessed their comprehension and interpretation of written materials.

To answer RQ1, correlational analyses (Pearson's r) examined the connections between reading comprehension scores, motivation, vocabulary size, reading self-efficacy, and receptive/productive collocational knowledge. Multiple regression analysis compared the standardised beta coefficients of all five independent variables to determine the best predictor of reading comprehension for RQ2. Three hierarchical regression models were built for RQ3: Model 1 (vocabulary size + receptive/ productive collocational knowledge), Model 2 (motivation + Model 1), and Model 3 (Model 1 + self-efficacy in reading). Whether self-efficacy or motivation increased predictive power was assessed by changes in adjusted R^2. Following pilot testing, all instruments showed satisfactory reliability (Cronbach's $\alpha > .70$). This multimethod approach guaranteed a Comprehensive understanding of the interaction of linguistic, cognitive, and affective aspects in ESL reading comprehension.

The following subsections present the details of these research instruments:

Receptive Collocational Knowledge Test (COLLEX)

A receptive collocation knowledge test, developed by Gyllstad (2009) and called the COLLEX test, was used to collect the data on respondents' receptive knowledge of verb-noun collocations. According to Gyllstad (2009), COLLEX is suitable for testing English language learners' receptive collocational knowledge and related combinatory skills. This indicates that the test can be used both for collocational knowledge measurement and word association knowledge. It has 50 multiple-choice items with three options for each item. Figure 1 presents a sample item of this test:

Figure 1. A sample item from the COLLEX test
Data Source. Gyllstad (2009, p. 157)

Figure 2. A sample item from the Collocation Recall Test
Data Source: Szudarski (2012, p. 32)

Productive Collocational Knowledge Test (Collocational Recall Test)

A productive collocational knowledge test developed by Szudarski (2012) measured the response's verb-noun collocation recall skill. This test is called the Collocation Recall Test and comprises 50 items requiring learners to fill in the blank space in a sentence with a suitable verb-noun collocation. Szudarski (2012) states that this test is suitable for measuring the productive collocation skills of ESL learners because its closed test format is generally considered adequate. A sample of this test is shown in Figure 2.

Vocabulary Size Test (VLT)

The Vocabulary Levels Test (VLT) was modified to measure the respondents' vocabulary size. This test has two versions; the first version was initially developed by Nation (1990) and has eight clusters with three items in each cluster, whereas the second version, developed by Schmitt, Schmitt, and Clapham (2001), has ten clusters with each cluster comprising three items. Nation (2001) described the second version as an improved form of his version, so the second version was used in this study.

VLT was explicitly designed to assess the vocabulary size of teachers; however, it is also widely used to assess vocabulary knowledge. It consists of high-frequency and low-frequency words presented in five levels: 2000, 3000, 5000, 10,000, and academic words. The test was adapted for the current undergraduate-level respondents, using only 2000 to 3000 words to keep the difficulty level of the test compatible with the university-level requirement. This adaptation was carried out due to a few previous studies (Ma & Lin, 2015; Cheng, 2007; Chen, 1999) in which it

was consistently found that the vocabulary level capacity of southeastern ESL learners generally ranges between 2000 – 3000 levels words, while the rest of the levels are difficult for learners at this level.

Motivation Questionnaire (LLOS)

Noel et al. (2000) asserted that the 'Language The Learning Orientation Scale (LLOS) was administered to measure the respondents' motivation. It has 20 statements that assess seven subscales on extrinsic and intrinsic motivations. The subscales of identified regulation measure the former, introduced regulation, and external motivation regulation. However, intrinsic motivation is measured by the subscales of intrinsic motivation knowledge (IMK), intrinsic motivation achievement (IMA), and intrinsic motivation stimulation (IMS). A five-point Likert scale records the learners' responses with a maximum score of 100. Cronbach's alpha (α) was determined for this scale in the data analysis stage, which was 0.81, according to Pallant (2020), which is adequate reliability for further quantitative analysis.

Reading Self-Efficacy Questionnaire (SSERC)

In this study, a questionnaire titled 'Scale of Self-Efficacy Beliefs in Reading Comprehension' (SSERC), which was explicitly designed to measure self-efficacy in vocabulary and reading comprehension tests, was used to collect data on respondents' self-efficacy. Epcacan and Demirel (2011) developed SSERC for English-language learners. It comprised 27 elements, and the response options on the Likert scale ranged from 'I'm very sure' (5) to 'I'm very uncertain' (1). These questionnaire items are stated in 'can do' form, which is recommended for self-efficacy surveys by Bandura (1980), who proposed the theory of self-

efficacy, recommended for self-efficacy surveys. Its reliability estimate (α = 0.89) was adequate for further quantitative analysis.

English Reading Comprehension Test

A reading comprehension test was adopted from an IELTS academic reading test that required constructed responses. The answers required the test-takers to use sufficient opportunities to use verb-noun collocations. It consisted of 10 short-answer questions. It was found to be used in this study because IELTS tests are considered valid and specifically designed for ESL / EFL learners (IELTS, 2023).

III. RESULTS

Descriptive and inferential statistical analyses were performed on the collected data. The frequency statistics at the descriptive analysis stage provided the respondents' standard deviations, mean score percentages, and secured score ranges on the COLLEX test, the Collocation Recall Test, the VLT, and the reading comprehension test. Table 1 presents these statistics:

Table 1 highlights the influential role of reading self-efficacy and receptive collocational knowledge in the respondents' textual comprehension. In this sense, motivation was also found to have a strong influence on reading performance (M= 70.0) in the current model. It implied that reading self-efficacy, closely related to motivation (Bandura, 1977), substantially contributed (M=100) to enhance the learners' reading performance. It was followed by receptive collocational knowledge (M=36.5).

Pearson's correlation analysis was performed at the inferential analysis stage to determine the relationship between receptive and productive collocational knowledge, motivation, and vocabulary size with reading comprehension performance. Table 2 shows the obtained correlation coefficients.

Table 1. The descriptive statistics of the Variables (*n*= 200)

Variables	Maximum Score	Std. Deviation	Mean Score (%)	Obtained Score Range
RCK	50	2.89	36.5 (73%)	27 (54%) – 46 (92%)
PCK	50	3.89	34 (68%)	24 (48%) – 44 (88%)
VS	60	3.94	41.5 (69.16%)	30 (50%) – 53 (88.33%)
RC	50	3.01	31.5 (63%)	18 (36%) – 45 (90%)
M	100	4.82	70 (70%)	45 (45%) – 95 (95%)
RSE	135	5.11	100 (74.07%)	70 (51.85%) – 130(96.29%)

Note. RCK = Receptive Collocational Knowledge determined by the Total Score of the COLLEX Test

PCK = Productive Collocational Knowledge by determining the total score of the Collocation Recall Test

VS = Vocabulary size determined by the total score of VLC

RC = Reading comprehension performance determined by the total score of the RC test.

M = Motivation determined by the total LLOS score

RSE = reading self-efficacy determined by the total score of SSERC

Table 2. Correlation between Variables and Reading Comprehension (*n*= 200)

Variables	RC	RCK	PCK	VS	M	RSE
RC	1.00					
RCK	.71*	1.00				
PCK	.63*	.70*	1.00			
VS	.49*	.63*	.56*	1.00		
M	.41*	.58*	.53*	.54*	1.00	
RSE	.46*	.55*	.52*	.57*	.60*	1.00

Note. *The correlation is significant at $p < .01$.

RCK = Receptive Collocation Knowledge determined by the Total Score of the COLLEX Test

PCK = Productive Collocational Knowledge by determining the total score of the Collocation Recall Test

VS = Vocabulary size determined by the total score of VLC

RC = Reading comprehension performance determined by the total score of the RC test.

M = Motivation determined by the total LLOS score

RSE = reading self-efficacy determined by the total score of SSERC

With reading comprehension performance, both receptive collocational knowledge and (r = .71, p < .01) productive collocational knowledge (r =.71, p < .01) had a positive, high and significant correlation with reading comprehension performance, indicating that a direct proportional increase in reading comprehension if the respondents' collocational knowledge of the respondents increased. This shows the affinity between both types of collocational knowledge, provided that the receptive collocational knowledge's associative disposition of receptive collocation knowledge had a relatively higher correlation than the productive correlation.

The vocabulary size also had a positive and significant correlation with reading performance (r = .49, p < .01). There was a moderate correlation on the verge of expanding. This also indicated that the vocabulary expansion would increase their reading scores. Motivation and reading comprehension had a significant correlation (r = .41, p < .01) that showed a proportional effect if the motivation increased. Lastly, a significant, moderate and positive correlation existed between self-efficacy in reading and reading performance (r = .46, p < .01). The results indicated that receptive collocational knowledge, followed by productive collocational knowledge, had the strongest correlation among all variables. These findings answered RQ 1 by revealing that all variables had a significant and positive correlation with reading comprehension, while receptive collocational knowledge had the highest correlation among these variables. This further showed how receptive and productive collocational knowledge relates to the learners' reading performance.

The regression models that predict reading performance are compiled in Table 2. With a highly significant model fit (F (3, 196) = 541.31, p <.001), Model 1, which comprised vocabulary size, productive collocational knowledge and receptive collocational knowledge, predicted 71% of the variance in reading outcomes ($R2$ =.71, adjusted $R2$ =.70). With a beta coefficient almost 15 times greater (β = 7.48, p <.001) than productive collocations (β = 0.25) and vocabulary size (β = 0.20), the knowledge of receptive collocation showed the most substantial standardised effect among the predictors, confirming its dominance in explaining comprehension of the language. This showed that receptive collocational knowledge could largely influence reading comprehension among RMAF cadets.

Motivation had a moderately favourable effect (β = 5.08, p <.001), and Model 2, which included motivation, explained 58% of the variation ($R2$ =.60, adjusted $R2$ =.58; F (3, 196) = 541.31, p <.001). Self-efficacy also had a similar effect (β = 5.12, p <.001), and Model 3, which included self-efficacy, also explained 58% of the variation ($R2$ =.60, adjusted $R2$ =.58; F (3, 196) = 541.31, p <.001). In particular, the better predictive capacity of linguistic factors is demonstrated by the 12% decrease in the explained variance ($R2$ =.12) between Model 1 and Models 2/3. Although self-efficacy and motivation are consistent with previous research showing that learners who have stronger self-beliefs perform better (Unrau et al., 2018; Epcacan & Demirel, 2011), receptive collocational knowledge (β = 7.48), which alone explained about 40% of Model 1 variance, outweighed their contributions (β = 5.0). By measuring effect sizes,

Table 3. Regression Analysis for the Most Contributing Variable to Reading Performance (n = 200)

Model	Variables	Beta (β)	P	F	R^2	Adjusted R^2
1	RCK	7.48	.000*	541.31	.71	.70
	PCK	7.29	.000*	541.31	.71	.70
	VS	6.68	.000*	541.31	.71	.70
2	M	5.08	.000*	638.82	.60	.58
3	RSE	5.12	.000*	638.82	.60	.58

Note. *The correlation is significant at p < .01.
RCK = Receptive Collocational Knowledge determined by the Total Score of the COLLEX Test
PCK = Productive Collocational Knowledge by determining the total score of the Collocation Recall Test
VS = Vocabulary size determined by the total score of VLC
RC = Reading comprehension performance determined by the total score of the RC test.
M = Motivation determined by the total LLOS score
RSE = reading self-efficacy determined by the total score of SSERC

variance contributions, and model superiority, these findings provide a significant response to RQ2 (receptive collocations as the strongest predictor) and RQ3 (linguistic variables > affective components).

IV. DISCUSSION

The findings revealed that general receptive and productive collocational knowledge, vocabulary size, motivation, and reading self-efficacy significantly contributed to reading comprehension performance. With a variance of 70%, collocational knowledge and vocabulary size significantly impacted reading outcomes because it is not surprising that reading comprehension requires the reader to comprehend chunks of language (Nation, 2001). This shows that vocabulary, location segments, and the learner's ability to understand and produce these segments play a vital role in adult learners' textual comprehension. The main finding was that students who score well in collocation better understand the text, in line with earlier research showing that readers utilise collocation to understand English (Li et al., 2022).

The findings also provided that motivational effects and reading self-efficacy beliefs would increase reading performance. This may be seen in light of the findings of Unrau et al. (2018), who found that intervening in learners' self-efficacy through awareness of training and techniques tends to improve reading comprehension. These findings are consistent with Anderson's theory that motivation is crucial in second-language cognition. The level of reading comprehension among the chosen respondents is predicted by their belief in self-efficacy in this area. (Khan et al., 2023). However, the present study included collocational knowledge in the form of broad types concerning reading comprehension in its model and then determined the correlations among these variables. The correlation values between receptive and productive collocational knowledge and reading performance revealed that the respondents' receptive collocational competence of the respondents (r = .71) was more highly correlated with their reading outcomes than their productive collocational knowledge; however, these two types of competencies had a more significant effect on the reading performance than any other variable in the whole model (Model 3). This value is slightly lower than that obtained by Yazdandoost,

AmalSaleh, and Kafipour (2014) in the Iranian EFL context. They found that collocational knowledge and reading comprehension performance had a significant correlation (r =.72); however, they did not separate collocational awareness into its types. Similarly, Ma and Lin (2015) found that the correlation between collocational knowledge and reading comprehension was 0.43, and again, they determined the value by overall collocational awareness. Farjami's (2023) study advocated that reading comprehension and collocation awareness are closely related. The findings of the independent sample t-test showed that reading comprehension abilities were significantly improved due to the collocation-focused activities completed as an extracurricular activity, according to the results of the independent sample t-test with 91.

The current study also found a positive and significant correlation between productive collocation competence and reading outcomes (r = .63). The current study presents in-depth results on collocational knowledge. Furthermore, this study focused on *verb-noun* collocational knowledge, so it narrowed down its periphery to this collocational type. The vocabulary size of the respondents exerts a significant effect on their performance, but this effect is lower than that of the collocational competence. This may be explained as though the vocabulary size is vital to comprehending a text. However, collocations are repetitive vocabulary chunks that appear to add more to meaning-making than single words. This study further revealed the importance of English collocational vocabulary, specifically verb-noun pairs.

Models 1, 2, and 3 in the regression analysis revealed that the most predictive of reading performance is the receptive collocational knowledge of the respondents. In examining Model 1, where motivation and self-efficacy beliefs are accounted for, it is evident that receptive competence remains the most significant contributing factor to reading outcomes. Here, it is plausible that passive input of collocational knowledge is generally higher in EFL/ESL learners because most productive skills, such as speaking and writing, are more challenging (Elhassi & Imssalem, 2017). It supports the findings of Alsakran (2011), who discovered a substantial gap between productive and receptive knowledge of Arab EFL learners. He claimed that the learners' production of collocational understanding was significantly inferior to their receptive collocational

awareness.

However, the current findings are different because the difference between the correlation values of receptive and productive knowledge is less pronounced than what Alsakran (knowledge) found. It can plausibly be explained in terms of the difference in linguistic environment. An EFL environment usually has fewer opportunities to exercise L2 language skills than an ESL environment (for example, Malaysia). In Models 2 and 3, in which motivation and reading self-efficacy were added turn by turn, receptive collocational knowledge still contributed the most to learners' reading performance. These affective variables portray a more in-depth picture of the knowledge of reading comprehension than merely collocational competence would do. However, collocational knowledge still overrides these two affective variables. Furthermore, compared to the results of Ma and Lin (2015), the contribution of motivation and self-efficacy in the current study is noticeably higher. This study's affective factors of motivation and self-efficacy contributed 58% of the variation (β=5.08 & 5.12, respectively). On the contrary, in Ma and Lin, motivation and self-efficacy after entering the model explained 25% of the variance in reading performance. Furthermore, the findings supported the researcher's previous conclusions by demonstrating that reading efficacy positively predicted students' English reading comprehension (Li & Gan, 2022).

These different findings may be explained in terms of the specialisation of Malaysian English language learners. These learners are given practice in the English language on a biweekly basis, and their mental bent is on being globally professional in the field of aerospace and aircraft mechanisms; therefore, they are usually more exposed to motivated situations than a regular university undergraduate usually is because the latter generally is less profession-orientated at this stage. The present study expands the reading performance picture regarding general Malaysian learners and aerospace technicians in a few ways. The study has several implications for ESL teachers, learners, Malaysian universities, English policymakers, and curriculum designers.

Implications of the study

This section will initially outline the study's theoretical implications and then discuss its practical implications.

Theoretical implications

The core finding of this study is that, of all variables, receptive collocational knowledge is the best predictor of reading performance. It also has the most significant correlation with the reading comprehension of Malaysian ESL learners. This finding corroborates the prevalent theoretical perspective in the ESL/EFL context that receptive vocabulary, or collocations, contributes significantly to reading comprehension performance (Ma & Lin, 2015). A learner with an extensive reservoir of receptive collocational vocabulary tends to promote its mechanics while comprehending a reading text, leading to better understanding. Furthermore, lexical collocations, especially verb-noun combinations, are vital in language learning because a language portrays actions and things like verb-noun combinations (Gulec & Gulec, 2015). In this way, receptive verb-noun collocational knowledge determines success in L2 reading. Theoretically, it is congruent with the prevalent proposition that more than 50% of linguistic items and categories that native users of language use appear in collocational form (Hill, 2000). Skehan (2009) also corroborates that a native speaker's cognitive bank of language and lexicon exists in language chunks that manifest as collocations. This way, communicative situations benefit from the pre-fabricated or memorised chunks in his mind, no matter which language skills the learner must practice or use. This improves language comprehension and speed, and reduces the cognitive load a text can put on the learner's mind if the learner does not have any L2 collocation bank. This also explains why reading is prescribed to L2 learners as a beneficial activity to learn that language. This also indicates why receptive collocational knowledge is usually more active in L2 learners than productive collocational competence.

Another finding about the affective factors of motivation and self-efficacy in reading highlights the theoretical perspective that the self-belief and confidence of a learner assist in successful language learning. The more effective a learner is, the greater the sense of confidence in performing the given reading task (Bagci & Unveren, 2020). It may be explained in general terms of confidence. Learners who believe in themselves often carry out a language

activity without inhibition and anxiety, positively affecting their success percentage. The learners who may have a good grasp of the language but lack self-efficacy may struggle with what they otherwise could easily accomplish; therefore, motivation and reading self-efficacy support successful reading comprehension while increasing the chances of better scores. Overall, positive relationships among receptive and productive collocational knowledge, vocabulary size, motivation, and self-efficacy in reading appear to make a good case for adequate reading comprehension.

Practical Implications

The findings of this study also provide some practical implications. Pedagogically, this study is specifically beneficial for ITAS and other Malaysian Aerospace Institutes that teach English reading comprehension as a compulsory training course. As the present findings indicated, receptive collocational competence contributes the most to their reading performance. It correlates most with receptive and productive collocational knowledge, vocabulary size, motivation, and reading self-efficacy. This implies that ESL teachers in these Air Force institutes can make learners more aware of the significance of collocational knowledge in increasing learner performance. Additionally, productive knowledge should be improved to improve the learners' reading outcomes. These learners and other Malaysian ESL learners can be instructed about the value of collocational knowledge by integrating more focused reading activities that require the learners to work with verb-noun collocations. Other lexical and grammatical collocations should also be integrated into the courses. It can help to improve learner reading performance if collocation clouds are taught and practised. In this way, the vocabulary and collocational fragment sizes can be increased, leading to better textual understanding. Authentic non-academic materials, such as English newspaper content, advertisement content, movie subtitles, and song lyrics, can enhance common native-like reading comprehension. The learners can be asked to underline useful collocations and make use of them in sentences and short story writing. Likewise, assessments and washback can be designed accordingly to address the learner's needs. Lastly, motivational aspects and self-efficacy factors are generally overlooked in ESL classes. These aspects must be considered by examining the self-efficacy

levels in reading occasionally and motivating them to carry out reading tasks, making them more attractive and engaging for learners. Adult learners may use the findings equally to self-instruct them accordingly, paying attention to the results.

V. CONCLUSION

This study examines the experiences of Malaysian ESL learners, specifically technicians from the Royal Malaysian Air Force. It underscores the essential role of understanding how words function together in achieving reading success. The findings indicate that learners who effectively recognise common verb-noun collocations, such as "make a decision" instead of "do a decision," tend to perform better in reading assessments. Proficiency in collocations and a robust vocabulary accounted for 70% of the variance in reading performance. Furthermore, the study highlights the significant impact of motivation and self-efficacy on learning outcomes, explaining 58% of the variations in student scores. This demonstrates the interaction between mindset and language proficiency. For educators, these findings suggest the importance of prioritising collaborative instruction and contextual reading activities, such as analysing real-world texts, while fostering learner confidence through acknowledging small achievements. It is important to note that the findings may not universally apply to younger learners or individuals in diverse professions. Future research could further enhance our understanding by integrating surveys with qualitative insights to explore the effectiveness of specific learning strategies. Ultimately, successful ESL instruction requires a balanced approach that combines the science of language with the emotional aspects of learning, promoting proficiency and a lifelong passion for language.

ETHICS STATEMENT

The UUM Research Committee reviewed and approved this study. The research adheres to ethical standards for publication in *Jurnal Arbitrer* and does not involve human subjects, animal testing, or social media data.

CREDIT AUTHOR STATEMENT

Nahazatul Halimi conceptualised and collected data, studied literature, formal evaluation, funding approval, inquiry, methodology, and initial draft preparation. *Rafizah Rawian* processed the concept, verified subjectivity, adduced literature, developed content, reviewed, and edited for final draft production.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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