

RELATIONSHIP BETWEEN VOCABULARY KNOWLEDGE AND READING COMPREHENSION OF SOUTH AFRICAN EFAL HIGH SCHOOL LEARNERS

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ABSTRACT

This paper is based on a study that used a quantitative method research design to investigate the impact of English academic vocabulary on the reading comprehension ability of Grade 11 English First Additional Language (EFAL) learners in the Fezile Dabi district of the Free State province, in South Africa. Three tests were administered, namely, a Vocabulary Levels Test (VLT) which measured vocabulary breadth, and a Word Associate Test (WAT) which measured vocabulary depth and a reading comprehension test. The results obtained from the analysis of the data indicate that while both depth and breadth of vocabulary knowledge played an important role in the participating learners' reading comprehension performance, depth of vocabulary knowledge seemed to be a better predictor of comprehension ability than breadth of vocabulary knowledge. The results further reveal that depth and breadth of vocabulary knowledge are positively correlated.

Keywords: vocabulary; vocabulary breadth; vocabulary depth; reading comprehension; vocabulary knowledge; English First Additional Language

INTRODUCTION

English as an international language is used by people throughout the world for different purposes. The English language is regarded very highly in South Africa. To this end, the majority of South African parents believe that English is the language of empowerment, and aspire to have their children educated in English, despite the fact that many learners entering English primary schools do not have the necessary background and English proficiency to succeed academically (Van der Merwe, 2014). One of the most elementary components in language learning is vocabulary. Learners need to know the vocabulary of a language in order to be able to use the language in a functional manner to address the four language skills notably speaking, listening, reading and writing. Mehrpour, Razmjoo & Kian (2011) identified sounds, grammar and vocabulary knowledge of the words as the three major components of language.

In an academic setting, reading is a very important skill to have for high school and tertiary students to cope with their academic tasks. Research has shown that having sufficient vocabulary is essential for reading comprehension (Tan & Goh, 2017; Kameli & Baki, 2013; Schmitt, Jiang & Grabe, 2011; Laufer & Ravenhorst-Kalovski, 2010; Nation, 2006; Qian, 2002;). Although EFAL learners may successfully decode and read fluently, knowing the meanings of words contained in a text is critical to reading comprehension. Harmer (1991) highlights this when he

states that if language structures make up the skeleton of language, then it is vocabulary that provides the vital organs and the flesh.

Language is often compared with a building: the structure of the building is grammar, and words are the bricks in the structure. Both are necessary and important, but the number of bricks exceeds the number of the structural elements, which is why no linguist today would seriously contest the fact that, quantitatively, vocabulary dominates in the language field and that vocabulary acquisition is the main obstacle to language acquisition (Ma, 2009). Also, research has shown that learning a foreign language fundamentally and immensely is dependent on vocabulary knowledge (Mehrpour, Razmjoo & Kian, 2011; Milton, 2009; Manyak & Bauer, 2009; Zhang & Annual, 2008). This study is about the role of English academic vocabulary on reading comprehension of English First Additional Language learners in the Free State province. This research was influenced by two main reasons. Firstly, the 2016 matric pass rate was 76.2% compared to a previous figure of 74%. In the same year, the national average mark for English Home Language was 54.7% with a pass rate of 94% out of 107 967 candidates. In English First Additional Language, the average pass rate was 49% with a national pass rate of 97.45 out of 547 292 candidates who sat for this subject. Our major concern was with the English First Additional Language average of 49% which was below 50% and significantly lower than the national pass rate of 76.2%. Secondly, the researchers had witnessed many cases of EFAL learners who failed to decode and even read fluently because they were lacking in vocabulary which was critical to reading comprehension. Hence, this study served to show the components of vocabulary knowledge which include breadth and depth and their links to reading comprehension.

In the context of the above, it became a push factor to come up with the research study about the role of English academic vocabulary knowledge on reading comprehension of Grade 11 EFAL learners in the Free State. This study would be beneficial in highlighting the importance or not of vocabulary in comprehending a text.

LITERATURE REVIEW

Vocabulary Knowledge and Reading Comprehension

Researchers are now aware of the multi-dimensionality of language development and difficulty of lexical knowledge (Kalajahi & Pourshahian, 2012; Schmitt, 2010; Lip, 2009; Shen, 2008; Pigada & Schmitt, 2006). To be cognisant of a word entirely embraces mixed types of vocabulary knowledge which include articulation, spelling, opposites, synonyms and word building (Alfaki, 2015; Moghadam, Zainal & Ghaderpour, 2012; Mehrpour, Razmjoo & Kian, 2011; Rashidi & Khosravi, 2010). The above serves to show the multi-faceted vocabulary knowledge as crucial in language proficiency. The study reported in this paper assessed the importance of breadth and depth of vocabulary knowledge thus highlighting the multi-faceted vocabulary knowledge as a fundamental aspect of language.

Chapelle (1998) proposes that a quality explanation of lexical knowledge has to take into account four proportions: vocabulary size, knowledge of word characteristics, lexicon organisation and processes of lexical access. Henriksen (1999) wishes for three detached but linked vocabulary proportions: partial-precise knowledge dimension, a depth of knowledge dimension and a

receptive-productive dimension (Shen, 2008). The present researchers noted that in both constructs noted above, there was an unambiguous consent that lexical knowledge ought to have at the slightest two constructs, namely vocabulary breadth (size) and vocabulary depth (quality).

Lexical familiarity is an obligatory constituent to reading comprehension (Qin, 2015; Nation, 2012). Therefore, measuring vocabulary has also become an indispensable *modus operandi* to envisage reading comprehension (Qin, 2015). Studies of vocabulary knowledge have made known that English language learners ought to be acquainted with approximated word families in order to grasp prescribed texts (Schmitt and Schmitt, 2014). Nation (2006) as well reported, relying on the results of his research, that 8 000-9 000 word families are necessary to read and understand 98% treatment of a manuscript devoid of help. Nation (2012) stressed the importance of being aware of how much lexical knowledge learners boast and this is noteworthy for curriculum developers. Notwithstanding the significance of gauging lexical knowledge, previous second language researchers have principally dwelt on finding out ways of determining learners' vocabulary breadth since it is more undemanding to enlarge instruments of breadth than grammatical familiarity (Qin, 2015). To fill the gaps left by previous researchers, the current study combined both breadth and deepness of lexical knowledge to seek out their positions on reading comprehension of Grade 11 EFAL learners.

Vocabulary Breadth and Reading Comprehension

Numerous studies have captured vocabulary breadth and its imperative function in reading comprehension (Qin, 2015; Laufer, 2010; Milton, 2009). This led to the birth of a globally consistent assessment for the evaluation of English Language aptitude (Baki, 2013). Laufer (2010) defines vocabulary breadth as vocabulary size that is the number of word types or families, for which a learner has at least the slightest knowledge of meaning. It can also be considered as the quantity of words that a language learner knows (Qin, 2015; Alfaki, 2015).

There is abundant proof to confirm that the quantity of vocabulary has a considerable function in forecasting reading comprehension capacity (Matsuoka and Hirsh, 2010; Nation, 2006). Qin (2015), Laufer (2010) and Milton (2009) reported that vocabulary breadth is a key feature in manipulating reading comprehension. Vocabulary breadth predicts reading comprehension and openly influences learners' reading development (Alfaki, 2015). When supplementary words are known by learners, the reading comprehension capability of the learners is improved (Qin, 2015; Laufer, 2010; Milton, 2009).

Vocabulary Depth and Reading Comprehension

Vocabulary depth, as a further element of vocabulary knowledge, has also been demonstrated as a solution to better reading performance, but the correlation between vocabulary depth and reading comprehension has not been extensively researched (Alfaki, 2015; Kang, Kang & Park, 2012). Read (2004) and Matsuoka and Hirsh (2010) define it as the quality of the learners' vocabulary knowledge; how one knows a word. The current researchers were made to believe that even if vocabulary breadth is a central factor in weighing up the reading comprehension, quality of vocabulary knowledge, additionally to what is accepted, has an important role in reading comprehension presentation.

Reading Comprehension

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Reading ability has always been considered as crucial to academic success (McNamara, 2004). In order to reach academic success, it is considered to be a fundamental element of EFAL learning (Rashidi and Khosravi, 2010). Reading is used not merely as a foundation of knowledge and enjoyment but also as a way of solidifying and expanding information (Rashidi and Khosravi, 2010; Schellings, Aarnnoutse and Leewe, 2006). Reading is a production of the implication of passage; it is a vigorous and deliberate procedure wherein the reader's expertise and awareness interrelate with the features of the textbook (Schellings et al., 2006). Reading comprehension is a complex mental process between readers and the texts, referring to readers' language competence and topic knowledge (Liu, 2015). Comprehension is termed as a deliberate judgment in which sense is constructed during exchanges involving a textbook and student (Harris and Hodges, 1995; Rashidi and Khosravi, 2010). This paper is based on the importance of word knowledge as the most significant element of reading. The most notable dimensions noted are breadth and depth of vocabulary on reading comprehension. The researchers remained focused on the role of English academic vocabulary knowledge on reading comprehension of grade 11 EFAL learners in the Free State.

METHODOLOGY

The purpose of this paper is to give an account of part of an explanatory sequential mixed methods research design of a doctoral study that was completed in 2018. However, in this paper, the entire thesis could not be accommodated. Only the quantitative area of the methodology is presented. The study conducted attempted to answer the following research question: What is the role of English academic vocabulary knowledge on reading comprehension of Grade 11 English First Additional Language learners in the Free State?

Participants

The study made use of the method of randomisation at the school understudy in order to end up with 30 participants. Only 30 Grade 11 EFAL learners were selected to participate in this study. They ranged in age from 16- 19. We requested for parental consent for their children to participate in this study. We also requested assent from learners to participate in this research.

Data Collection Instruments

The data collection instruments used were as follows: Vocabulary Levels Test (VLT) developed by Nation (2001)), the Word Associate Test (WAT) developed by Read (1993; 2000) and Reading Comprehension Test developed by Cambridge University. There was no need to contextualise the VLT and WAT to make them culturally compatible because these instruments do not have proper nouns of which meanings are sometimes not universal. Instead, these instruments have common nouns, verbs, and adjectives of which meanings are undoubtedly universal. Only the Reading Comprehension was slightly altered by quoting the figures in South African Rands instead of the initially quoted US dollars.

Vocabulary Levels Test (VLT)

To measure the vocabulary breadth of the Grade 11 EFAL participants, a VLT was used. Only three frequency levels were chosen for this study. It gives an approximation of vocabulary size at 2 000, 3 000 and 5 000 frequency levels. There are 10 clusters at each level and each cluster has six words and three definitions. Thus, the test comprises 90 items. Participants are required to match the definitions on the right in each cluster with the corresponding words on the left. Since the VLT in this study included three levels, the highest possible score was 90 (1-point x 30 items x 3 levels). Schmitt et al. (2001) report that reliability coefficients range from .92 to .96 for different sections of the test. Qian (1999) also obtained reliability of 0.92 for the measure.

Word Associate Test (WAT)

The WAT measures receptive knowledge by means of association tasks. There are 40 words which are followed by a listing of eight words, four of which are semantically related to the target word while the other four are not. Its reliability, as reported by Read (1993) is 0.92.

Reading Comprehension Test (RC)

The participants wrote a comprehension test that had four passages with different topics and multiple-choice questions. The highest possible score was 30. The test was used as a placement tool mainly for non-native speakers of English who wished to pursue tertiary studies (Wainer and Wang, 2001). The reliability score for the entire test is 0.98 (Wainer and Wang, 2001).

Data Collection Procedure

Before learners took each of these tests, they were informed of the general aim of the study and were told that their performance on the test would not affect their course outcome. The data collection procedure was carried out in three sessions. In the first session, the VLT was administered to the participants followed by the WAT in a second session. The third session was for the reading comprehension test. The tests were written at a week's interval.

Data Analysis

R-programming was used to conduct the analysis of the data. One-tailed Pearson product-moment correlations and multiple regression were used as the dominant techniques for the statistical analyses. One-tailed product-moment correlations were computed for scores from the RC, VLT, and WAT to find any possible relationship among the three variables. In the regression analysis, the scores on the RC were used as the dependent variable and those of VS and DVK as independent variables.

RESULTS

The results of the data collected through the VLT, WAT and RC, are presented in the sections that follow:

Pearson correlations to determine the relationship among the three variables: VLT, WAT and RC

The results of the Pearson correlations between the vocabulary breadth, depth and reading comprehension are displayed in Table 1. **Table 1: Pearson correlations between the vocabulary breadth, depth and reading comprehension**

Variables	Breadth	Depth	Reading
Breadth	1	0.89	0.90
Depth	0.89	1	0.95
Reading	0.90	0.95	1

(*P<.01)

In statistics, the Pearson correlation coefficient *r* measures the strength and direction of a linear relationship between two variables on a scatterplot. The value of *r* is always between +1 and -1. A value close to 1 implies a strong linear relationship between the two variables and indicates movement in the same direction. A value close to -1 indicates a strong relationship through an inverse movement between the two variables. Finally, a value close to zero means there is no association between the variables.

The P-value is the probability that you would have found the current result if the correlation coefficient were zero (null hypothesis). If this probability is lower than the conventional 5% (P<0.05) the correlation coefficient is called statistically significant.

As shown in Table 1, the learners' reading comprehension performance is strongly connected with their breadth of vocabulary knowledge ($r = .90, p < .01$), meaning that a superior vocabulary allowed learners to remember additional information from the text they read. There is a high and arresting correlation between depth of vocabulary knowledge and reading comprehension ($r = 0.95, p < .01$) which suggests that profound knowledge of words helps learners grasp the text better. In view of the relationship between the two independent variables of depth and breadth of vocabulary knowledge, one notices an encouraging and statistically important correlation ($r = .89, p < .01$) which indicates that these two aspects of vocabulary knowledge are unified, that is, these learners who have a large vocabulary size also have a deeper knowledge of the words.

Table 2: The results of the extent to which scores of vocabulary depth and vocabulary breadth contribute to predicting the performance on reading comprehension

Criterion variable	Predictor variable	R ²
Reading comprehension	Depth	0.90
	Breadth	0.81

The Coefficient of determination, r^2 , is a measure of how much of the variability in one variable can be "explained by" variation in the other. For example, if $r=0.8$ is the correlation between two variables, then $r^2=0.64$ is the coefficient of determination. Hence, 64% of the variability in one variable can be explained by differences in the other variable. The coefficient ranges from 0 to 1,

proximity to 1 indicates that changes in the predictor are strongly related to changes in the response variable and that the model explains a lot of the response variability.

In Table 2, there are high coefficients which imply heavy dependence and inter-relatedness of the above variables with each other. The coefficient of determination of 0.81 represents the proportion of overlap between breadth of vocabulary knowledge scores and reading comprehension scores. It also shows that 81% of the variance in breadth of vocabulary scores is shared with reading comprehension scores. Therefore, breadth of vocabulary knowledge accounts for about 81% of the variance in reading comprehension.

In Table 2, 0.90 provides an approximation of the percentage of the overlapping variance between depth of vocabulary knowledge and reading comprehension. The coefficient of determination of 0.90 interprets that 90% of the variance in depth of vocabulary knowledge is shared with reading comprehension. Therefore, depth of vocabulary knowledge accounts for about 90% of the variance in the criterion variable which is reading comprehension. Hence, learners' performance in reading comprehension is heavily influenced by ability in breadth and depth. For the learners to perform highly in reading comprehension, they have to have high lexical knowledge.

Multiple regression for the relationship between reading comprehension and independent variables

Table 3 shows multiple regression for the relationship between reading comprehension and independent variables, notably breadth and depth of vocabulary knowledge.

Table 3: Multiple regression for the relationship between reading comprehension and independent variables

Model	R²	F	Sig.
Multiple Linear regression	0.82	34.50	<0.005

Multiple regression analysis is a powerful technique used for predicting the unknown value of a variable from the known value of two or more variables- also called the predictors.

As illustrated in Table 3, the relationship between reading comprehension and the independent variables -the regressors- depth and breadth of vocabulary knowledge, is significant at $p < .05$. As Table 3 shows, the R^2 index is 0.82, a relatively good fit, indicating that 82% of the variation in reading comprehension is accounted for by the independent variables. Hence, in this study, there is a relatively good fit since the multiple regression linear model is an accurate predictor as depicted by the coefficients in Table 3.

Partial regression coefficients for the relationship between RC and independent variables-VLT and WAT

A value indicating the effect of each independent variable on the dependent variable with the influence of all the remaining variables held constant. Each coefficient is the slope between the dependent variable and each of the independent variables.

We use Table 4 on the assumption that to some extent each independent variable (breadth and depth) is related to the dependent variable, which is, reading comprehension.

Table 4: Results of the t-test procedure

	Mean	t-value	Df	p-value	Std deviation	Std error
Depth	72.8	1.8738	57.386	0.06605	7.57	1.70
Reading Comprehension	68.9				8.40	1.83

In Table 4, the two means are 72.8 and 68.9 for vocabulary depth and breadth respectively. T-tests presume that both groups (breadth and depth) are normally distributed and have relatively equal variances. As shown in Table 4, there is no statistically significant difference between depth of vocabulary knowledge and reading comprehension scores ($t=1.8738$, $p>0.05$). This means that performance in the two tests is almost similar.

Table 5: Statistically significant difference between breadth and reading comprehension scores

	Mean	t-value	Df	p-value	Std deviation	Std error
Breadth	64.1	-2.1958	57.89	0.03213	8.77	1.95
Reading comprehension	68.9				8.40	1.83

Table 5 demonstrates that there is no statistically significant difference between breadth of vocabulary knowledge and reading comprehension scores ($t=-2.1958$). This means that performance in the two tests is similar but the difference in p-values between the two tables (Tables 4 and 5) indicates that depth of vocabulary knowledge is a better predictor of reading comprehension in comparison with breadth of vocabulary knowledge as a predictor of reading comprehension. The results show that vocabulary size and vocabulary depth are both appreciably interrelated to reading comprehension performance although vocabulary depth of vocabulary knowledge predicts reading comprehension performance better.

DISCUSSION OF FINDINGS

One of the findings in the current study is the relationship between depth of vocabulary knowledge and reading comprehension. The results of the Pearson correlations statistical analysis reveal that there is a high and significant correlation between vocabulary depth and reading comprehension ($r = 0.95$, $n=30$, $p < .01$) which suggests that deeper knowledge of words

helps learners understand the reading comprehension better. This is confirmed by a study by Harkio and Pietila (2016) and Kang, Kang and Park (2012) in which they also found a very strong, positive correlation between the scores on vocabulary depth and the reading comprehension test.

The Pearson correlations shows a strong link between RC performance and vocabulary breadth

($r = .90$, $n=30$, $p < .01$). As in the above, this was corroborated by Harkio and Pietila's (2016) and study which also established a strong and affirmative relationship linking vocabulary breadth and reading comprehension.

In English First Additional Language contexts, both vocabulary breadth and depth are important components in the vocabulary-reading comprehension chain, and correlations of these two independent variables with reading comprehension, and with each other (Qian, 2002). For English First Additional Language learners whose vocabulary size is between the 2000 and 5000-word threshold for reading comprehension, scores on depth of vocabulary knowledge will make a unique and distinctive contribution to the prediction of reading comprehension scores, over and above the prediction afforded by vocabulary breadth scores (Qin, 2002, 1999).

However, the depth of vocabulary scores has the capacity to improve the prediction of the reading comprehension scores over and above the predictive powers of the vocabulary breadth scores. The study serves to show a high and positive correlation between the two dimensions of academic vocabulary knowledge, that is, depth and breadth. This study's results support the existing studies that vocabulary depth and not breadth of vocabulary knowledge, is the stronger predictor of reading comprehension (Pasquarella, Gottardo and Grant, 2012; Kang, Kang and Park, 2012; Rashidi and Khosravi, 2010; Verhoeven and Leeuwe, 2008).

On the contrary, the findings reported in this paper are in contrast with some researchers' findings who conclude that the breadth of vocabulary knowledge contributes more to promoting reading comprehension than depth of vocabulary knowledge (Baleghizadeh and Golbin, 2010; Laufer and Ravenhorst-Kalovski, 2010; Farvardin and Koosha, 2011). Even Elmasry's (2012) results of multiple regression analyses indicate that vocabulary breadth and vocabulary depth are individually good predictors of reading comprehension. While in this study vocabulary breadth alone accounted significantly for 40% of the explained variance in reading comprehension, vocabulary depth alone accounted significantly for 31.9% of the variance. In other words, in this study's results, vocabulary breadth was a more powerful predictor of reading comprehension than vocabulary depth.

Implications of the Findings on EFAL Landscape

The findings in this study have great implications for EFAL teachers, learners and learning material developers. The results demonstrate the need for teachers to know their learners' vocabulary knowledge and reading comprehension abilities. In turn, this would help them design more appropriate learning tasks that widen learners' academic vocabulary knowledge in an EFAL environment. Based on the respondents' performance in VLT, WAT and RC, EFAL teachers should assist learners to reach a sufficient threshold for them not to struggle with vocabulary related issues and reading comprehension.

These results could be of great assistance to learners who hope to broaden their vocabulary knowledge and improve their reading comprehension. It becomes imperative for such EFAL learners to extend the convention of freehand reading as a foundation of amusement and self-development. Teachers need to assist learners in choosing the most appropriate learning materials when they (learners) are doing vocabulary activities. The appropriateness of the chosen learning materials implies that the content should cater to both constructs of vocabulary knowledge, notably breadth and depth. It is recommended that learners value vocabulary breadth in as much as they embrace vocabulary depth because both constructs still have a significant contentious bearing on vocabulary knowledge and reading comprehension.

To a large extent, the results also present learning material designers with invaluable information for developing and endorsing English texts. Any designed English reading material needs to take cognizance of EFAL learners' vocabulary threshold and reading comprehension ability. Learning material designers' main focus needs to be on developing formal and informal activities that promote the growth of learners' vocabulary breadth and vocabulary depth which in turn will sharpen their reading comprehension abilities.

CONCLUSION

The purpose of this paper is to give an account of the role of English academic vocabulary knowledge on reading comprehension of Grade 11 English First Additional Language learners in the Free State. It draws attention to the fact that EFAL teachers, learners and learning material developers need to incorporate both dimensions of vocabulary knowledge – breadth and depth - into English first additional language teaching and learning. English first additional language learners will benefit more in EFAL reading comprehension when they are equipped with both an adequate size of vocabulary and deep knowledge of words.

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