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BREADTH AND DEPTH-VOCABULARY KNOWLEDGE AND READING COMPREHENSION IN AN ENGLISH FIRST ADDITIONAL LANGUAGE CONTEXT

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Abstract

Most research has been concerned predominantly with vocabulary breadth in comparison with vocabulary depth. This study aims to bridge this gap by answering the following question: How do scores on vocabulary size, depth of vocabulary knowledge and reading comprehension correlate with each other? This study used quantitative method research on grade 11 English First Additional Language (EFAL) learners. Only 30 participants took part in the study. The independent variables used are the Vocabulary Levels Test (VLT) and Word Associate Test (WAT). Then, the dependent variable Reading comprehension is the dependent variable. The results indicated that 81% of the variance in the breadth of vocabulary scores which was measured through the VLT was shared with reading comprehension scores obtained in a reading comprehension test out of 30. On the other side, 90% of the variance in depth of vocabulary knowledge scores measured through a WAT was shared with reading comprehension scores. However, the depth of vocabulary scores could improve the prediction of the reading comprehension scores over and above the estimation accomplished by the vocabulary breadth scores. The results demonstrated the need for teachers to know their learners' vocabulary knowledge and reading comprehension abilities.

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INTRODUCTION

Up to the 1980s, grammar was the central study area for second language acquisition research. However, in the last three decades, vocabulary has become a major focus of linguistic works or, to quote Meara, "has mushroomed enormously" (Meara 1995: 11), even being at the heart of theories such as the Lexical Learning Hypothesis according to which "vocabulary knowledge is indispensable to acquire grammar" (Malvern, Richards, Meara & Milton 2008: 270).

The complexities of the reading process have been long established by now, and numerous subcomponents of reading comprehension, such as decoding skills, vocabulary knowledge, syntactic knowledge, and inferencing skills have been identified. Among these various components, however, vocabulary knowledge is especially crucial even from the beginning, as without it one cannot process and discern meanings of even simple sentences or clauses (Kang, Kang & Park, 2015). Language-learners, teachers, and researchers agree that vocabulary is an essential element in the process of learning a language (Schmitt, 2008) because words are the primary conveyors of meaning (Vermeer 2001) and thus carry the main information load in communication. Learners should know the vocabulary of a language to be able to use the language in a purposeful way to tackle the four language skills markedly speaking, listening, reading and writing.

There is an increasing recognition that vocabulary knowledge is composed of multiple dimensions rather than a single construct; several researchers have proposed various frameworks to define the complex nature of word knowledge (Choi, 2013). To be cognisant of a word entirely embraces mixed types of vocabulary knowledge which include articulation, spelling, opposites, synonyms and word building (Alfaki, 2015; Rashidi & Khosravi, 2011). It is for this reason that this study embraces vocabulary breadth and depth of vocabulary knowledge as a basic feature of the language.

A large body of studies has demonstrated that one's vocabulary breadth is a powerful predictor of reading comprehension ability (Qin, 2015; Choi, 2013). This led to the birth of a globally consistent assessment for the evaluation of English Language aptitude (Baki, 2013). On the other hand, small vocabulary size may cause difficulties in reading comprehension (Perfetti, Landi & Oakhil, 2005). Vocabulary breadth, sometimes called vocabulary size, may be used to reflect a learner's recognition vocabulary only: their ability to recognize the form of a word as a real word in the foreign language and distinguish it from an artificially created non-word (Milton 2013). The term may also be used to reflect a learner's ability to recognize a word and link it to the meaning or a translation in the first language (ibid). 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 number 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 (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 also 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).

Vocabulary depth reflects accurate knowledge of words, and it has been identified as an important predictor of reading comprehension abilities. Although vocabulary depth, as a further element of vocabulary knowledge, has also been demonstrated as a solution to better reading performance the correlation between vocabulary depth and reading comprehension has not been extensively researched (Alfaki, 2015; Kang, Kang & Park, 2012). Vocabulary depth is less well defined. It can be characterised in terms of knowledge of any of the several facets which Nation (2001) lists and which might involve knowledge about a word rather than just recognising it: associational knowledge, collocational knowledge, inflectional and derivational knowledge, knowledge of concepts and referents, and knowledge of constraints on use (Milton, 2013). Read (2004) and Matsuoka and Hirsh (2010) define it as the quality of the learners' vocabulary knowledge, how one knows a word. Vocabulary depth denotes knowledge about words that include various features of words such as their spelling systems, pronunciations, syntactic and morphological features, and semantic relations (Hudson, 2007).

Reading ability has always been considered as crucial to academic success (McNamara 2004). To reach academic success, it is considered to be a fundamental element of EFAL learning (Rashidi & 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 & Khosravi, 2010). 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, Aarnnoutse & Leewe, 2006). Comprehension is termed as a deliberate judgment in which sense is constructed during exchanges involving a textbook and student (Rashidi & Khosravi, 2010).

Theoretical Framework

This section provides briefly the theoretical framework that forms the basis for this study. In conceptualizing this study, Qian's (2002) theory on vocabulary knowledge is the conceptual framework upon which this study hinges.

Qian (2002) proposes that vocabulary knowledge consists of four intrinsically connected dimensions of vocabulary knowledge: vocabulary size, depth of vocabulary knowledge, lexical organization and automaticity of receptive-productive knowledge. Vocabulary size is about the number of words in a language; while vocabulary depth refers to the quality of knowing a word. The third dimension is the lexical organization, which refers to the storage, connection, and representation of words in the mental lexicon of a learner. Lastly, the automaticity of receptive-productive knowledge refers to all the fundamental processes through which access to word knowledge is achieved for both receptive and productive purposes.

In comparison to Qian's (2002) theoretical framework, Henriksen (1999) describes a model of lexical (vocabulary) development as follows: partial to precise knowledge, depth of knowledge and receptive to product usability. Meara's (2005) theoretical framework also describes a model of lexical competency/skill in three ways namely: vocabulary size, vocabulary organization, and vocabulary accessibility. Daller, Milton & Treffers-Daller, (2007) developed a vocabulary theoretical framework that describes a learner's vocabulary knowledge in lexical space as follows: lexical breadth, lexical depth, and lexical fluency.

Qian's (2002) theoretical framework describes four vocabulary dimensions. However, the first thing to note about the three frameworks above is that they all assume three dimensions, perhaps, either true to a geometrical definition of space assuming length, breadth, and depth or simply giving support to the proverb that says that all good things come in threes (Gyllstad, 2013). As to the first dimension of the three models, it could be seen to deal with the same underlying process, namely the building of a repository of vocabulary items. As in Qian's (2002) first dimension, what is characteristic of this dimension in all the three models is that it has more to do with quantity (which Qian names vocabulary size) than quality (which Qian names depth of vocabulary knowledge). Meara's (2005) vocabulary size and Daller et.al.'s (2007) lexical breadth is very similar in this sense whereas Henriksen's (1999) partial to precise knowledge dimension refers to the development of individual word knowledge (Gyllstad, 2013).

There are differences among the theorists as regards the second dimension which is vocabulary depth. Qian (2002) describes the second dimension as the depth of vocabulary knowledge. Daller et. al. (2007) see lexical depth largely from a word knowledge framework perspective. Meara's second dimension is called vocabulary organization and it is conceptually different from that of Daller et.al. (2007). Meara proposes a vocabulary dimension that is structured and makes up a learner's mental lexicon (Gyllstad, 2007). Henriksen's second dimension, called depth of knowledge, may sound closer to that of Qian's depth of vocabulary knowledge.

Thus, there is a glaring interrelatedness between the four different vocabulary knowledge theoretical frameworks. In all the four frameworks, they agree on vocabulary breadth and vocabulary depth (although they use different terms) as the most influential two aspects of vocabulary knowledge as reported by Qian (2002). Consequently, the current researcher turned to thrash out the viability of these two aspects (vocabulary breadth and vocabulary depth) in this study to see if they could be treated as either complementing or opposing constructs.

RESEARCH METHODOLOGY

The study conducted attempted to answer the following research question: How do scores on vocabulary size, depth of vocabulary knowledge and reading comprehension correlate with each other? This study used a quantitative method research. Because this is a quantitative research study, a deductive approach was used. The deductive approach has its foundation in quantitative or scientific research. Scholars such as Locke (2007) and Nola and Sankey (2007) reported that this approach adopts rigorous scientific methods to gather and analyse numeric data. Then, the data is subjected to robust statistical analysis, which deductively contributes to the body of knowledge. The deductive approach was adopted because it helps to identify the theory which underpins the study, testing its implications per its data set.

The study made use of the method of randomisation at the school understudy to end up with 30 participants. Only 30 grade 11 EFAL learners were selected to participate in this study. The researcher requested for parental consent for their children to participate in this study. Also, the researcher requested assent from learners to participate in this research.

The data collection instruments used were as follows: Vocabulary Levels Test developed by Nation (2001) modified by Schmitt, Schmitt and Clapham (2010), Word Associate Test developed by Read (1993) and Reading Comprehension developed by Cambridge University. Before learners took the test, 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 the second session. The third session was for a reading comprehension test. The R-programming was used to analyse the data.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

After the collection of the data through the VLT, WAT, and RC, the data was presented as in the following figures to answer the question: How do scores on vocabulary size, depth of vocabulary knowledge and reading comprehension correlate with each other?

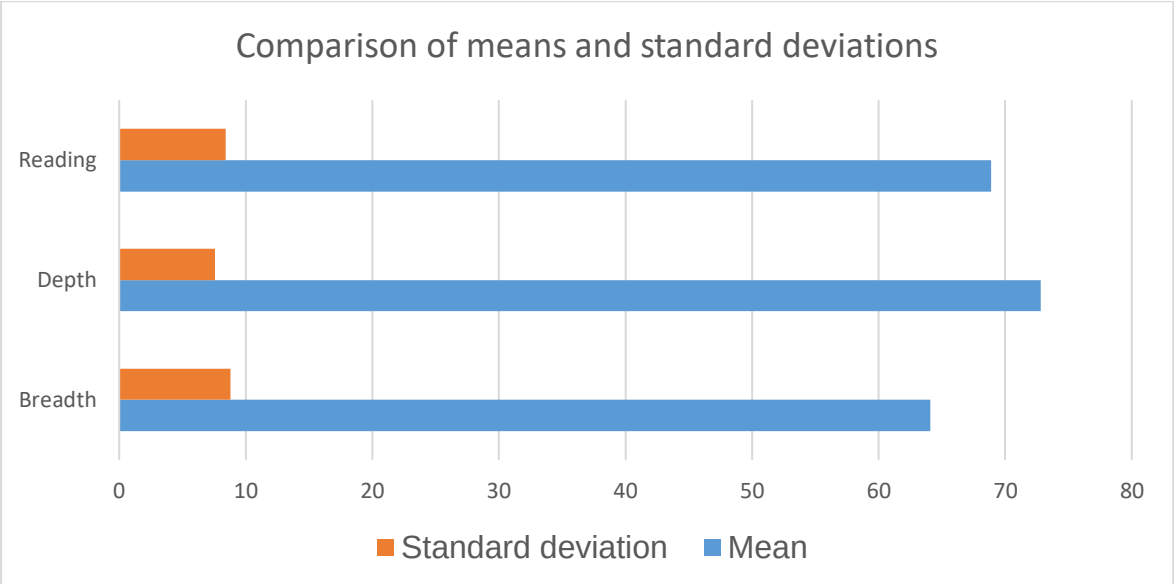

Figure 1. Comparisons of means and standard deviations

As the bar chart showed, the mean score of the breadth of vocabulary knowledge, vocabulary depth, and reading comprehension were 64.1, 72.8 and 68.9 respectively. These means illustrated almost identical performance in VLT, WAT, and RC. Further, the standard deviations of 8.4, 7.57, and 8.77 respectively depicted low and marginal variability in the respondents' performance in VLT, WAT and RC tests. This showed consistency in performance because of the low standard deviations between the variables, VLT, WAT, and RC test performances. Another interpretation was that the above statistical metrics showed good performance due to the high mean marks of 64.1, 72.8 and 68.9. Hence, learners performed well in reading comprehension for having mastered breadth and depth aspects. The marginal variation in the learners' performance showed satisfactory proximity to the means 64.1, 72.8 and 68.9 indicating generally good performance by most learners. Some learners performed below average. Nevertheless, the respondents' mean scores still outlined a strong inter-relatedness between reading comprehension, depth and breadth aspects.

Scatter graphs to show the nature of the correlation between variables

The researcher presented the scatter graphs to show the nature of the correlation between the respective variables: breadth, depth and reading comprehension.

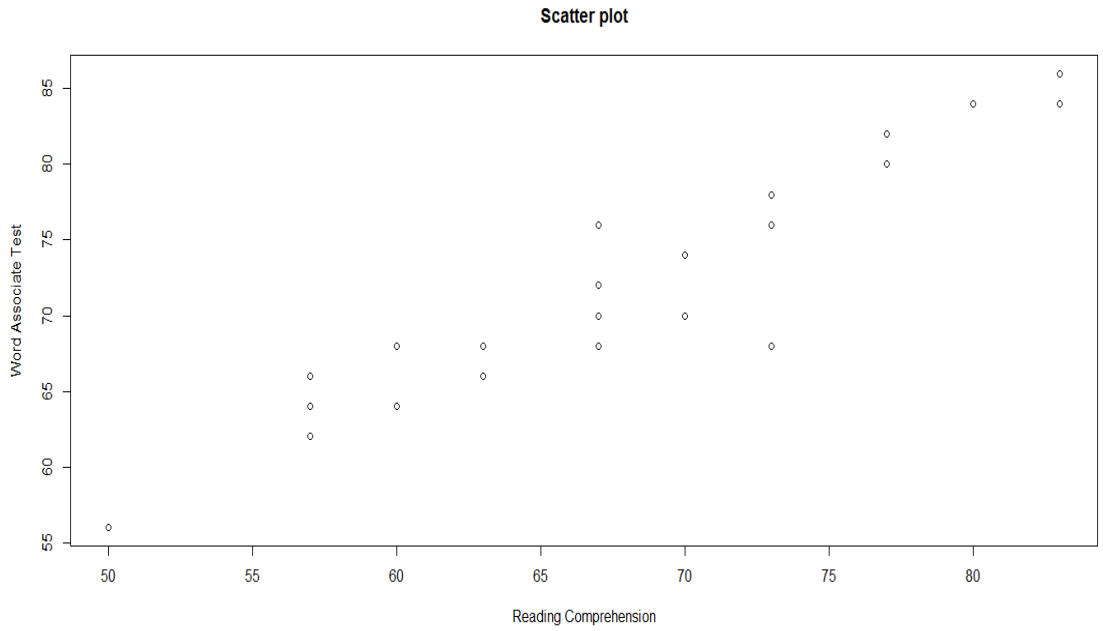

Figure 2. Scatter plot of WAT and RC

When explaining the relationship between two quantitative variables, it would be best to use a Scatterplot. The Scatterplot above showed an almost perfect linear correlation between depth of vocabulary knowledge and reading comprehension. There was a strong positive correlation of 0.95 between the depth of vocabulary knowledge and reading comprehension. Higher proximity in clustering implied that the depth of vocabulary knowledge was a comparatively stronger predictor of reading comprehension than breadth. The learners performed well with marginal variation in the marks. This strong association indicated that learners' performance in reading comprehension was heavily influenced by their depth of vocabulary knowledge. In other words, the strong correlation between the depth of vocabulary knowledge and reading comprehension suggests that a deeper knowledge of words helps learners comprehend the text (reading comprehension) better.

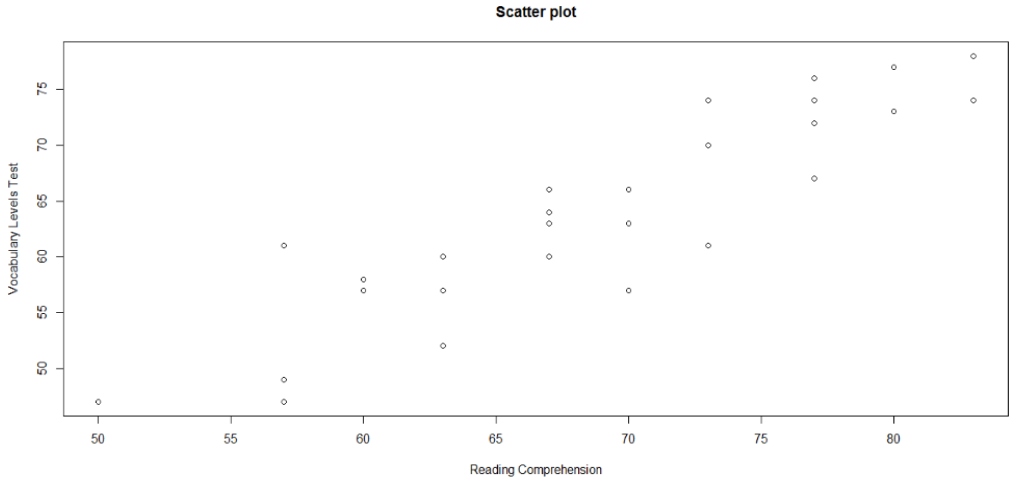

Figure 3. Scatter plot of VLT and RC

Figure 4.3 above showed a high positive correlation between the breadth of vocabulary knowledge and reading comprehension. There was a strong positive correlation of 0.90 between breadth of vocabulary knowledge and reading comprehension. This strong relationship was indicative of the significance of a good understanding of the breadth of vocabulary knowledge by the respondents for them to become proficient in reading comprehension. The high correlation between the breadth of vocabulary knowledge and reading comprehension implied that a larger vocabulary made it possible for learners to recollect more information from the text they read. Hence, it was quite clear that reading comprehension was strongly dependent on the breadth of vocabulary knowledge.

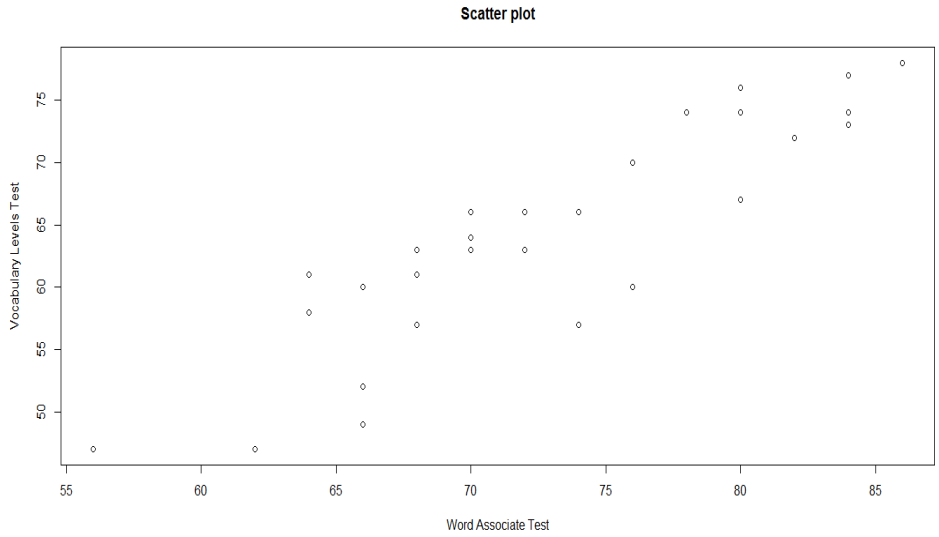

Figure 4. Scatterplot of VLT and WAT

The above figure depicted a strong positive association between the depth of vocabulary knowledge and breadth of vocabulary knowledge. The inter-relatedness implied almost

identical performance levels between learners hence these aspects should be developed in unison for effective mastering of the depth of vocabulary knowledge and breadth of vocabulary knowledge. The high correlation of 0.89 between the two independent variables of the depth of vocabulary knowledge and breadth of vocabulary knowledge suggested that those learners who had a large vocabulary size had a deeper knowledge of the words too.

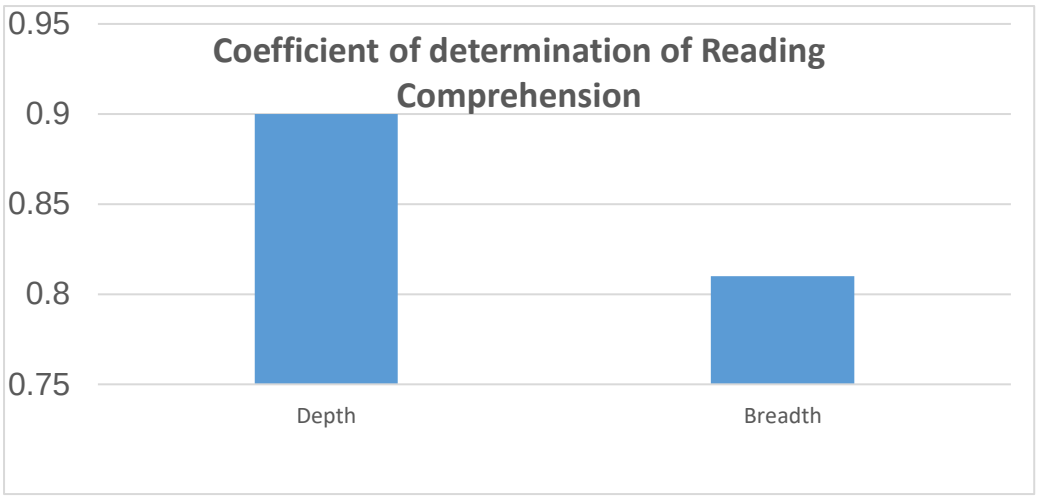

Figure 5. The coefficient of determination of depth and breadth of vocabulary knowledge against reading comprehension

The above figure showed the coefficient of determination of the depth of vocabulary knowledge and breadth of vocabulary knowledge against reading comprehension. The coefficient of determination of 0.81 represented the proportion of overlap between breadth of vocabulary knowledge scores and reading comprehension scores. It also interpreted that 81% of the variance in the breadth of vocabulary scores was shared with reading comprehension scores. Therefore, the breadth of vocabulary knowledge accounted for about 81% of the variance in reading comprehension. Based on these results, it could be claimed that the depth of vocabulary knowledge and breadth of vocabulary knowledge were important factors in reading comprehension. Therefore, the depth of vocabulary knowledge was as important as the breadth of vocabulary knowledge. Although the slightly higher correlation coefficients found in the present study between depth of vocabulary knowledge and reading comprehension assumed that depth of vocabulary knowledge was superior to the breadth of vocabulary knowledge, and depth of vocabulary knowledge had a stronger relationship to reading comprehension than did the breadth of vocabulary knowledge. The two measures were closely associated together and with reading comprehension.

Discussion

The study conducted attempted to answer the following research question: How do scores on vocabulary size, depth of vocabulary knowledge and reading comprehension correlate with each other? The potential limitation to the study is that only 30 learners were used as participants in this study. Perhaps, if the researcher had used more participants, the results could have been different. To answer the research question, the study has shown that there was a strong positive correlation of 0.95 between the depth of vocabulary knowledge and reading comprehension. The coefficient of determination of 0.90 indicated that 90% of the variance in the depth of vocabulary knowledge scores was shared with reading comprehension scores. Also, the strong correlation between the depth of vocabulary

knowledge and reading comprehension suggested that a deeper knowledge of words helped learners comprehend the text better. The high correlation of 0.89 between the two independent variables of the depth of vocabulary knowledge and breadth of vocabulary knowledge suggested that those learners who had a large vocabulary size had a deeper knowledge of the words too.

This study showed that the vocabulary depth of vocabulary knowledge predicted reading comprehension performance better than vocabulary breadth. In as much as the results for both breadth and depth of vocabulary knowledge were almost equal, the results of the coefficient of determination of depth and breadth against reading comprehension reported otherwise. The results indicated that 81% of the variance in the breadth of vocabulary scores which was measured through the VLT was shared with reading comprehension scores obtained in a reading comprehension test out of 30. On the other side, 90% of the variance in depth of vocabulary knowledge scores measured through a WAT was shared with reading comprehension scores. This meant that 81% and 90% of the participants' performance in reading comprehension was attributed directly to breadth and depth proficiency respectively. Hence, any variation in the participants' depth and breadth ability was reflected in their reading comprehension with 81% and 90% certainty. As a guiding principle to the teaching of reading comprehension, the researcher felt that teachers should place enough emphasis on both breadth and depth of vocabulary knowledge.

Closer scrutiny of the predictive powers of the vocabulary breadth and depth of vocabulary knowledge tests confirmed that scores of the vocabulary depth and vocabulary breadth were both relatively unique, and distinctive, predictors of reading comprehension scores.

However, the depth of vocabulary scores could improve the prediction of the reading comprehension scores over and above the estimation accomplished by the vocabulary breadth scores. The study served to show a high and positive correlation between the two dimensions of academic vocabulary knowledge, that is, depth and breadth. However, depth of vocabulary knowledge was reported as a better predictor of reading comprehension aspects although learners needed to develop them side by side. Other researchers in support of the current study insist that vocabulary depth is the stronger predictor of reading comprehension than the breadth of vocabulary knowledge (Nation, 2006; Verhoeven & Leeuwe, 2008; Rashidi & Khosravi, 2010; Pasquarella, Gottardo & Grant, 2012; Kang, Kang & Park, 2012).

The principal implication of this research is that teachers should value both vocabulary breadth and vocabulary depth so that they enhance English first additional language learners' understanding of the reading comprehension. It becomes imperative for the teachers to expose learners to different texts that will help address both their vocabulary breadth and depth much needed in reading comprehension.

CONCLUSION

The findings have huge implications on EFAL teachers, learners' and material developers. The results established the need for teachers to be familiar with their learners' vocabulary knowledge and reading comprehension aptitude. The development of depth of L2 learners' vocabulary knowledge is generally consistent with the breadth of their vocabulary knowledge, for different language learners, the development of both constructs should be very balanced. This means teachers should not only expand the breadth of their learners' vocabulary but also pay attention to the development of their depth of vocabulary knowledge. Sequentially, this would assist them devise more fitting learning tasks that broaden learners' academic vocabulary knowledge in an EFAL background. Anchored in the respondents' performance in VLT, WAT, and RC, EFAL teachers should support learners to attain a satisfactory threshold for them not to struggle with vocabulary related issues and reading comprehension.

These results are of immense help to learners who anticipate widening their vocabulary knowledge and advancing their reading comprehension. To accomplish the above, it becomes crucial for such EFAL learners to widen the convention of freehand reading as a foundation of amusement and self-development. Learners should select the most suitable learning materials when they are doing vocabulary activities on their own. The correctness of the chosen learning materials means that the content should cater to both constructs of vocabulary knowledge, notably breadth and depth. It is recommended that learners value vocabulary breadth as much as they embrace vocabulary depth because both constructs still have a contentious bearing on vocabulary knowledge and reading comprehension.

To a large extent, the results also present material designers with precious 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. Material designers' main focus needs to be on developing formal and informal activities that endorse the growth of learners' vocabulary breadth and vocabulary depth which in turn will hone their reading comprehension aptitude.

This paper draws attention to the fact EFAL teachers, learners' and material developers need to incorporate both dimensions of vocabulary knowledge – breadth and depth into English second language teaching and learning. English second language learners will benefit more in EFAL reading comprehension when they are equipped with both an adequate size of vocabulary and a deep knowledge of words.

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