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# Reading comprehension and Vocabulary size

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**Abstract**

This research paper investigates the relationship between vocabulary and reading comprehension. It attempts to highlight the effect of vocabulary size on reading comprehension. The participants of this study are 60 second year baccalaureate students. The study contains two types of testing. The first test is Meara's (2010) X-Lex test of measuring vocabulary, where students are supposed to distinguish between words they know and others they don't know. The second test is a reading comprehension text, which tests the student's reading comprehension. The results indicate that there is a strong relationship between vocabulary and reading comprehension. Another result found is that reading comprehension is affected by word frequency; the more often a word occurs, the easier the comprehension of the text becomes.

Key words: vocabulary size. Reading comprehension. X-Lex test

## Literature review

### I.    Introduction:

Vocabulary plays a vital role in the process of language learning, its role is considered an important variable influencing learners' reading comprehension, in both first and second language learning (Anderson & free body ,1983).  Jitendra, Edwareds, Sacks, and Jacobson (2004) concluded "vocabulary and word knowledge CAN contribute to improved comprehension, and it provides a sound rationale for increased emphasis on vocabulary instruction" (p.299). This means that vocabulary facilitates comprehension. Similarly, Bromey (2007)

reported, "vocabulary is a principle contributor to comprehension (p. 528). That is to say, vocabulary is the ultimate component that contributes to comprehension.

Vocabulary comprehension is fundamental to reading comprehension; people can't understand texts without knowing what most of words mean. Many previous studies have documented the relation between word knowledge and reading comprehension (Anderson & Free body, 1981), yet the field of vocabulary is worth further investigations, especially in the Moroccan context.

### II.    What is vocabulary

What does vocabulary mean? This question has been raised by many researchers. According to Schmitt (2000, p1) when people ask that question, the first idea that comes to their minds is "words". It's a formulation that is admirably adequate for a layperson, but for anyone interested in exploring the magic of lexis, the term word is too general to encapsulate the various forms vocabulary takes. Nash & Snowking (2006) describe vocabulary as the knowledge of words. Sheeham (2002) states that vocabulary is the ability to use words to understand and convey meanings.  Beck, Mckeon, and Kucan (2008,p1) state " vocabulary are words that a reader recognizes in print and learning meanings."

Researchers have provided many answers to this question, mainly because they have used different definitions of what a word is. A word is a unit formed of sounds or letters that has meaning (Sheeler and

**RESEARCH ARTICLE**

Markley 2000,p.2). while vocabulary is defined as total number of words someone knows and is able to use (Nandy 1994 , p.1; Sesnan 2001, p.123).

## 1    What does it mean to know a word?

What does a learner need in order to know a word? When speaking of a person's vocabulary, it means the words that one knows and their ability to use them (Nandy 1994,p1). Rubin and Thompson (1994, p.79) point out that one cannot speak, understand, read, or write a foreign language without knowing enough words. Therefore, vocabulary learning is at the heart of mastering any foreign language. Some scholars (eg .Browen et al.,1985; Jackson and Amvela, 2000; Read ,2000;Trask,1995) indicate that a word may be easy to perceive but hard to define. Task (1995, pp.46-51)points out that there are  difficulties in defining  words because they do not have meaning in isolation, but are related to the meanings of other words.

Nation (2001) divides word knowledge into three areas: knowledge of form, knowledge of meaning and knowledge of use. Each of these areas is sub divided: (see table below)

➢ Knowledge of a word *form* might involve knowing what a word looks like. This is the phonological form.

➢ Knowledge of word *meaning* is divided into parts. The first sub-division is form and meaning, which involves forming a link between a foreign language word and its translation. The third sub-division is concepts and referents and associations.

➢ Knowledge of word *use* is also divided into three parts, which are grammatical functions, collocations, and constraints on use.

Nation also divided these areas into receptive and productive knowledge.

| Form | Spoken | R | What does the word sound like? |
|---|---|---|---|
| | | P | How is the word pronounced |
| | Written | R | What does the word look like |
| | | P | How is the word written and spelled |
| | Word parts | R | What parts are recognizable in this word? |
| | | P | What parts are needed to express meaning? |
| Meaning | Form and meaning | R | What meaning does this word form signal? |
| | | P | What word form can be used to express this meaning? |

**RESEARCH ARTICLE**

| | | | |
|---|---|---|---|
| | Concepts and referents | R | What is included in the concept? |
| | | P | What items can the concept refer to |
| | Associations | R | What others words could we use instead of this one ? |
| | | P | What other words could we use instead of this one? |
| Use | Grammatical functions | R | In what patterns does the word occur ? |
| | | P | In what patterns must we use this word? |
| | Collocations | R | What words or types of words occur with this one? |
| | | P | What words or types of words must we use with this one? |
| | Constraints on use | R | Where, when, and how often would we meet this word? |
| | | P | Where , when and how often can we use this words ? |

Source : Nation(2001: 27)

Note: R= receptive, P=productive

According to Nation (2001), People don't know everything about  a word just after learning it, sothey continue adding meanings to their mental lexicon  throughout their lives. Moreover, knowing one or two meanings for most words is not nearly the full set of word information that is eventually built; even after knowing a word, learners keep updating and adding pieces to the vocabulary repertoire they have.

### III.    What is reading
### 1    Introduction
Reading is critical to success. The ability to read is very important to succeeding and surviving in a school environment (Bukhour, 1990).  The child who does not read or does not read well is at a serious disadvantage in his/her opportunities to develop the prior knowledge necessary to be successful (Bukhour 1990,p.4). Reading is a complex

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**RESEARCH ARTICLE**

activity that requires a successful selection, application, and monitoring of multiple strategies (Wixon& Lipson, 1991). It is a process of problem solving in which the reader works to make sense of a text not just from the words, but also from the sentences evoked by those words. At first glance, reading may seem to be passive, but in fact it is active (wivson& Lipson , 1991). According to Erfanpour (2003), there are two known approaches used to develop reading skill: extensive and intensive reading.

Extensive reading:

Extensive reading is reading rapidly; the reader reads book after book. There is focus on the meaning of the text itself, not the language. Powell (2005) reports that in Japan more students enjoy extensive reading and the total of number of books read by the class has increased from 26 to 153. Krashen (1982) indicates that the unconscious process of language acquisition while reading for enjoyment is more attractive and successful for second-language learners than conscious learning.

Intensive reading:

Intensive reading means that the readers take a text, study it line by line, and look up the meaning of difficult words in a dictionary. According to Paran (2003, p.40), "intensive reading activities are needed for four main reasons, to help learners comprehend written texts, to become more aware of text organization to better comprehend, to learn how to use and monitor effective reading strategies, and to develop general literacy skills necessary to generate productive expressions in foreign languages." Intensive reading can be beneficial to expand reading comprehension (Yang, Dai & Cao, 2012). This reading approach is very useful for learning

vocabulary and understanding how text is organized (Waring, 1997).

Paran (2003) and Hill (1997) claim that both extensive and intensive are beneficial to achieve reading goals at different levels because they are one unit and they complement each other.

## IV.    Reading comprehension

Reading comprehension is the process of constructing meaning by coordinating a number of complex processes that include word reading, word and world knowledge, and fluency (Anderson, Hiebert, Scoltt, & Wilkinson, 1985; Jenkins, Larson, & Fleischer, 1983; O'Shea, Sindelar, & O'Shea, 1987). Reading comprehension is the process of making meaning from text. It aims to gain an overall understanding of what is described in the text in general, rather than to obtain meaning from isolated words or sentences. (Kintsch 1998; van Dijk and Kintsch, 1983). This reading type is more than a response to a text. It is a multicomponent, highly complex process that includes many interactions between the reader  and what is in the texts, such as previous knowledge as well as variables related to thetext itself (Klingner, Vaughn, & Boardman, 2007).

Comprehension: a cognitive process:

What is actually happening when we comprehend what we are reading?

The comprehension skill involves interaction of cognitive skills and processes. (Cain and Oakhill 2007).The Cognitive theory focuses on the connection between language and thinking, also the reader's ability to make appropriate choices between contextual cues to decode and comprehend text.(Linnenbrink and Pintrich 2003; Paris and Winograd 1990; Schunk 2004). The readers must

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**RESEARCH ARTICLE**

consider the intention of the author as well as their own background knowledge and experiences that they bring to the text (Pearson and Raphael 1990). From this theoretical perspective we conclude that both the reader and the text play an important role in the comprehension process.

Meaning and comprehension:

Reading comprehension is understanding, gaining meaning and interpreting the text (DeCorte et al. 2001). Meaning is formed in the reader's head, which means that a person's prior knowledge affects the kinds of meanings constructed from the text information (Fukkink and de Glopper 1998; Lipson 1983). From this perspective an individual's existing knowledge is a major determinant in acquiring new information (Ausubel1968; Cain and Oakhill 1999; Griffin et al. 1995). Moreover, the reader's comprehension of the text is considered to be linked to the reader's ability to construct hypotheses, rules, schemas, and mental models (Vipond 1980).

Comprehension and the active learner:

Skillful readers are known by being active and self-regulating learners (Harris and Pressley 1991). The notion that children actively construct new meanings by assimilating or accommodating old knowledge structures with new knowledge, which is related directly with their ability to reflect upon the reading task. A reader centered approach to making meaning is intrinsically motivating because it promotes the application of strategies that foster self-monitoring of reading comprehension (Gersten et al. 2001; Vaughn et al. 2000).

## Research design

**The purpose of the study**

The purpose of this study is to investigate the relationship between vocabulary and reading comprehension.

## Research question

This research aims to answer the following question: Does vocabulary knowledge facilitate reading comprehension?

## Hypotheses

The hypothesis of this study is:

The larger vocabulary students have, the better their reading comprehension is.

## Research sitting and participant

The study was conducted at EcoleModerne De L'enseignement El Fatih (EMEPE) high school in Meknes, Morocco, during the second semester of the 2014/2015 school year.The sample used in this study consisted of a total of 60 baccalaureate science students, aged between 17and 18. At the time of the study, all participants had studied English for at least three years.

### Research instruments

The two instruments used to collect the data were Meara's X-Lex test for vocabulary and a reading comprehension text.

The X-Lex test was designed by Meara (2010) to be used with learners of English as a second language.The test was chosen because of its validity to provide a rough lexical profile of individual students, and to monitor the progress of students whose lexical profile has already been established. 4 levels of the test were administered to each student to measure the development of their vocabulary background; level 1 and 2 represent the core vocabulary of English that every speaker needs to know in order to understand what they hear and read;

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**RESEARCH ARTICLE**

level 3 and 4 are more challenging because they contain low frequency words. Each level corresponds to a basic vocabulary of about 1000 words, each test consists of 60 items: 40 real words and 20 fake ones. The test takers have to decide whether they know the words or not by marking the word with Y or N. Each level contains two different tests to facilitate reliable measurement. The students were given 6 minutes to finish each level.

The comprehension text consisted of a text extracted from a recent baccalaureate exam paper of 2010 for science, technology, and original streams. This text was selected because of its simplicity and clarity. Furthermore, it addresses the areas of research. In this test, students have to read the text and answer its questions. These questions were divided into five sections. The first part was true or false questions, which checked the students' understanding. Next, was the sequence of events part to assess their ability to organize the events in a logical manner. Then, the section about completing sentences, which talks about events. The fourth section, synonyms, tested their understanding of words with the same meaning. Finally is the section of pronouns to test the students' comprehension of the text and their understanding of a core concept of English. The time devoted for this task was 25 minutes.

### Data analysis

Gathered data gathered from two sources: scores from the X-Lex test and from the reading comprehension test. The X-Lex data provided by the test takers was analyzed quantitatively via frequencies and percentages given by the test designer Paul Meara (2010). Then the reading comprehension data was graded according to the standard of the baccalaureate exam. Both the data sets were analyzed by using the SPSS and EXCEL software in calculating numbers and then presenting them as graphs.

### Data presentation and analysis

### Introduction

This section presents and analyzes the data provided by text and tests. It aims to discuss the data gathered before.

### Vocabulary test

All 60 participants took all four levels of the X-Lex. The following table shows the students' score means of each level. It should be pointed out that these scores correspond to the percentages calculated on the basis of hits and false alarms, as explained by Meara (2010):

|  | X-LeX level 1 | X-lex level 2 | X-lex Level 3 | X-lex Level 4 |
|---|---|---|---|---|
| Mean Score | 74,46% | 60,83% | 51,18% | 41,88% |

**Table 1: The mean of  X-Lex  level tests**

The next diagram presents the results of the table above as a graph.

**RESEARCH ARTICLE**
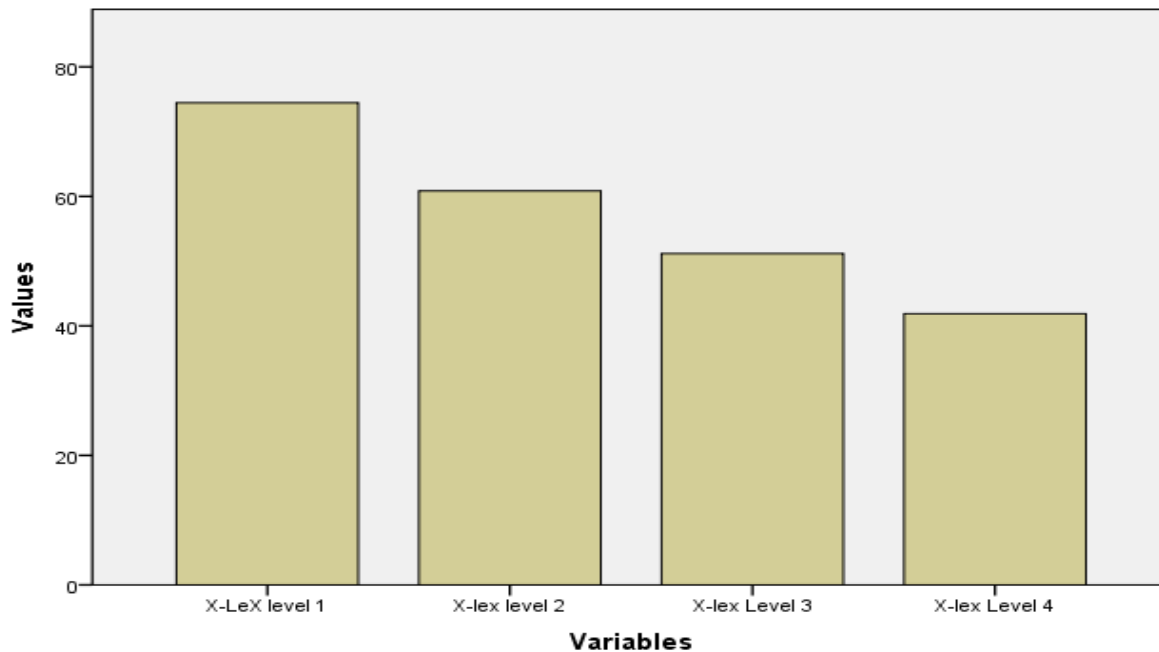
**Statistics**
**Mean**



**Figure1:  graphic representation of The mean of X-Lex  level texts**

- This figure represents the mean of each level of X-lex. It is clear that the percentage of the mean varies between 74,46, the highest percentage, and 41,88, the lowest percentage. This shows a degradation of the mean, from the easiest level, level 1, to the most difficult, level 4.

This graph accords very well with what Meara (2010) call the "Typical" profile, because it slopes gently from the left to the right. According to Meara (2010), this can be explained by the frequency of words. The more frequent words are, the more easily they will be recognized by learners. The X-lex tests were designed based on word frequency, that means that level 1 contains the most frequently used words; this frequency gets lower when the levels get higher.

To conclude, the results show that students learn and acquire frequently-used words before the less frequent ones.

**Results of the reading comprehension test**

As was mentioned before, a second year baccalaureate comprehension exam was used to test students' reading comprehension skill. The grading followed was the same as the one suggested by the writers of the test, which was over 15 points. The mean was higher than the average also, only few students show poor understanding. As the table below shows The table below shows the number and percentage of students who achieved each score:

**RESEARCH ARTICLE**

|  |  | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
|  | 4,00 | 1 | 1,7 | 1,7 |
|  | 8,00 | 1 | 1,7 | 3,3 |
|  | 9,25 | 1 | 1,7 | 5,0 |
|  | 10,75 | 2 | 3,3 | 8,3 |
|  | 11,00 | 1 | 1,7 | 10,0 |
|  | 11,50 | 1 | 1,7 | 11,7 |
|  | 12,00 | 6 | 10,0 | 21,7 |
| Score | 12,50 | 3 | 5,0 | 26,7 |
|  | 13,00 | 3 | 5,0 | 31,7 |
|  | 13,25 | 1 | 1,7 | 33,3 |
|  | 13,50 | 4 | 6,7 | 40,0 |
|  | 13,75 | 3 | 5,0 | 45,0 |
|  | 14,00 | 18 | 30,0 | 75,0 |
|  | 15,00 | 15 | 25,0 | 100,0 |
|  | Total | 60 | 100,0 | 100,0 |

**Table 2: The comprehension score**

The reason behind these higher score achieved by the students is probably the type of vocabulary used in that text, also the majority of vocabulary used has high frequency and they are basic words of English.

The text contains approximately 110. The functional words and repeated ones are not included.

65 words are high frequent vocabulary, they are important words to know for learners of English as a 2nd foreign language. According to Longman dictionary of contemporary English. They are important because they are the most common words in spoken English.

·   26 words are less frequent vocabulary, 14 of them are words which are important words to know for learners of English as a  2nd  foreign language.

·   19 words are low frequency vocabulary, they contain 7 words are important words to know for learners of  English as  2nd  foreign language.

Since the text contains many frequent words, students score high grades.

**Vocabulary and reading comprehension**

Correlation is a statistical technique that shows the degree and the type of a relationship between any two or more quantities or variables. Correlation vary from +1 to  -1 values, the closer  to +1 indicate a higher degree of positive correlation,  and value closer  to +1 indicate a higher degree of negative correlation , values closer to 0 indicate poor correlation of either kind, and 0 indicates no correlation at all .
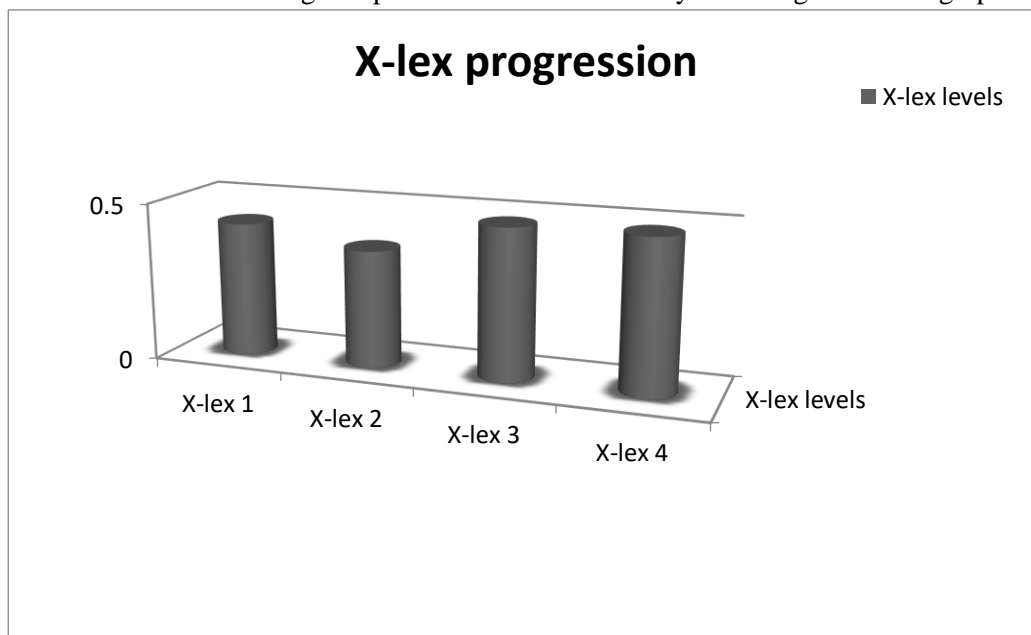
In this research the use of correlation coefficient is meant to test if there is a relationship

**RESEARCH ARTICLE**

between reading comprehension and vocabulary background, also to quantify the strength of this relationship.

Correlations between reading comprehension and vocabulary size are given in the graph bellow



The correlation between reading comprehension and X-lex level 1 is > 0,42

The correlation between reading comprehension and X-lex level 2 is > 0,37

The correlation between reading comprehension and X-lex level 3 is > 0,47

The correlation between reading comprehension and X-lex level 4 is > 0,48

The graph shows that correlation between reading comprehension and vocabulary background is significantly positively correlated. In other words, reading comprehension and there is a strong relationship between reading comprehension and vocabulary frequency.

These results show the relationship between vocabulary and reading comprehension; that is to say if students have large vocabulary background they are not going to find difficulties in understanding texts. This close relationship between these two variables is illustrated more in the chart below.
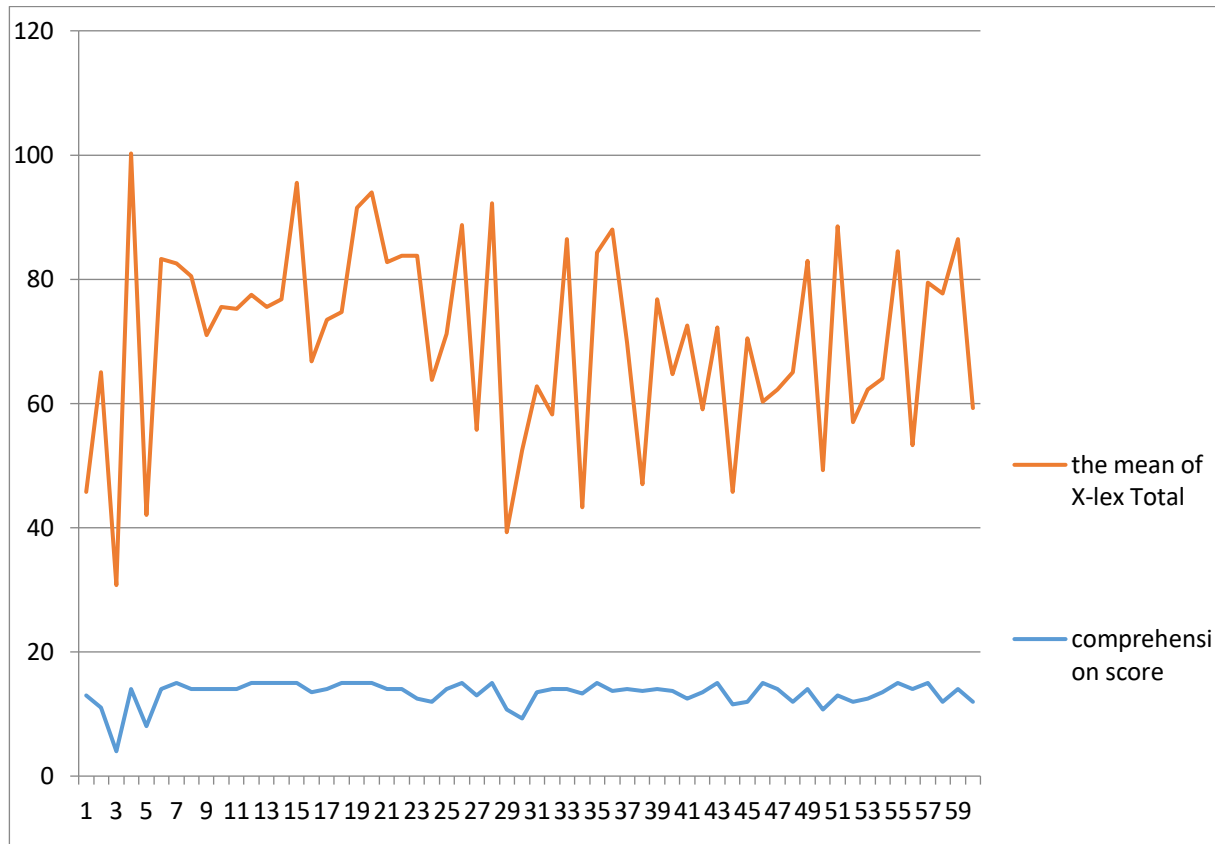
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**Figure 3: Relationship between the mean of X-lex total and comprehension score**

Figure 3 presents the vocabulary score of students in comparison with their score in reading comprehension. From the first glance, when the red line goes up the blue line also goes up. This result means that when a student has a good score in vocabulary test, he also gets a good score in reading comprehension.

The interpretation of this result supports the results of research reported mentioned earlier in the literature review    (cf. Anderson &Freebody , 1981;Mezynsky , 1983; Nagy , Herman , & Anderson,1985). These studies have found a significant correlation between vocabulary knowledge and reading comprehension.

**Findings**

The purpose of this study is to investigate the relationship between vocabulary and reading comprehension. The findings of the study show that there is a strong relationship between vocabulary and reading comprehension.  In other words, the more vocabulary background students have, the better their reading comprehension becomes. Another result found is that understanding text is affected by the word frequency; the more frequent vocabulary a text contains   the easier comprehension text is.

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**RESEARCH ARTICLE**

### Pedagogical implications

Some pedagogical implications that can be drawn from the findings of the study are:

Students have to pay a great attention to their vocabulary background,

also to work on broadening it.  In addition to that, students have to have a rich vocabulary which is not restricted only to the high frequent words.

### Research limitations:

The major limitations of this research can be summarized in:

The X-Lex test contains many mistakes.  Level four of the test includes correct words that were considered fake.  This leads to inaccurate results.  To solve this problem, level four was omitted from the study.  The second problem was with Meara's table (2020) that converts hit and false alarm rates to the percentage vocabulary score. Time constraints, Data were collected data from 60 participants, baccalaureate; level. For further studies a researcher may design their own vocabulary test instead of using Meara's test.

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