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The Effect of Short-Term Vocabulary Knowledge on Reading Comprehension of Iranian Intermediate EFL Learners

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Abstract
The present study was an attempt to explore the effect of short-term vocabulary knowledge on the reading comprehension of Iranian intermediate EFL learners. The participants were divided into two groups of control and experimental, each comprising 30 learners. The experimental group received a series of treatments aimed at improving reading comprehension while the control group was taught traditionally. An online reading comprehension level test from Oxford was given to both groups as the pre and post-tests. After data collection, a Mann-Whitney U test was run to investigate the reading comprehension levels of the participating groups before and after the treatment. The results of the study highlighted the significant effect of short-term vocabulary knowledge on the experimental group participants as they received it as the treatment. The study's findings may be useful in helping teachers understand the implications of incorporating short-term vocabulary knowledge into their English classes in order to improve their students' reading comprehension, as well as answering some of their questions about how to use and improve this short-term vocabulary knowledge in their classrooms.

Keywords: Short-term, Vocabulary knowledge, Reading comprehension
1-Introduction

One of the most significant aspects of foreign language (FL) or second language (L2) learning and teaching is vocabulary development [1]. Vocabularies can be active or passive. Active vocabulary can be used in productive skills like speaking and writing, and passive vocabulary can be used in receptive skills like listening and reading. Students' comprehension and productions are hampered by a lack of vocabulary knowledge, so they should learn enough vocabularies to communicate fluently in the target language [2]. Vocabulary knowledge has been found to be a predictor of reading comprehension success. Without understanding the text's vocabularies, no text comprehension is possible, whether in one's native language or in a foreign language. An improvement in vocabulary knowledge can be linked to improved reading comprehension. Understanding the words in a text is a prerequisite for reading in a foreign language. When it comes to comprehending texts, students see words as the primary means of conveying meaning. As a result, lexical difficulties will prevent successful comprehension. According to Laufer [3], no text comprehension is feasible, either in one's native language or in a foreign language, without knowing the text's vocabulary. As a result, for FL/L2 learners, expanding their vocabulary is both a priority and a challenge.

To begin learning an unfamiliar word, the reader should recognize it as one she is unfamiliar with [4]. However, studies have shown that foreign language learners do not always recognize unfamiliar words as such [5]. One reason could be that students who grasp the overall meaning of the text do not focus on the precise meaning of each word. Another explanation is that learners are unable to recognize a new word because it is confused with another word.

Second, reading comprehension is the process of extracting information from text. The most basic materials for comprehension are vocabularies. When a student encounters an unfamiliar word while reading, he or she attempts to deduce its meaning from the context. Not all contexts, however, contain clues for unfamiliar words. Furthermore, readers may disregard clues if they believe they already know the meaning of new words or if the correct meaning is not "compatible with the readers' knowledge of the world [6]."

Third, foreign language readers will ignore unfamiliar words in a text if they believe they are unimportant to the text's comprehension. They pay attention to the words that they believe are important [6].

Fourth, the frequency with which unknown words are encountered is an important factor in their learning because it takes several encounters with a word to learn it [7]. To put it another way, first exposures to a new word may result in limited comprehension. Learners' knowledge of a word will grow as they are exposed to it more frequently. They argue that learners should "read extensively one or two books each week" to occur, learners should "frequent exposures". However, in a classroom setting with limited instructional hours, such a large amount of reading is not possible. Students with a limited vocabulary are more likely to struggle with reading comprehension knowing that vocabulary is an important component of language[8]; and that vocabulary knowledge is vital for developing communication skills, reading comprehension, and learning a new language [9].

The present study intends to show the positive or negative effect of short-term vocabulary knowledge on reading comprehension.

2-Litreture Review
Second/foreign language learners recognize the importance of vocabulary the most. A vocabulary problem exists in non-native language users who frequently find themselves looking for words to express themselves in speaking and writing. Due to a limited vocabulary load, they also report feeling demotivated while reading and listening. The importance of vocabulary knowledge and, more specifically, its link to reading abilities is also recognized by language experts and researchers[10].

The impact of vocabulary knowledge on comprehension is one of the well-studied aspects of researches on reading. Children with more vocabulary knowledge comprehend text better than those who have less, according to research on readability and test construction, as well as the effects of vocabulary instruction on reading comprehension [11]. According to Richards and Renandya [12], vocabulary is a crucial component of language proficiency because it determines how well a learner speaks, listens, reads, and writes. Based on the definitions provided above, vocabulary can be defined as a word that has a specific meaning that a person uses. One of the first things applied linguistics focused on was vocabulary, which is one of the most noticeable aspects of language.

Learning vocabulary is an essential aspect of learning a second language, which Paivio [13] emphasized as part of his Dual Theory, believing that learning vocabulary is a much more important and complex goal in and of itself than most foreign language teachers believe. Paivio [13] claims that "learning vocabulary is an important objective in and of itself, far more important and complex than most foreign language teachers admit". He believes that vocabulary learning proficiency is a critical component of second language classroom success. According to Schmitt [14], students in L2 require approximately 2,000 words to conduct conversations, 3,000 word families to interpret authentic text, and up to 10,000 words to comprehend complex academic texts. He stated that while vocabulary learning concepts are still a mystery, we can be certain that words are not acquired without delay, at least for adult second language students. Instead, they are learned over a period of time through a series of exposures. The progressive nature of vocabulary acquisition is reflected in a number of ways.

In the process of learning vocabulary in a foreign language, Brown and Payne [15] identified five steps:

1. Having sources for encountering new words
2. Obtaining a clear image of the new words' forms
3. Learning the meanings of the words
4. Forming a strong memory connection between the forms and meanings of the words
5. Using the words As a result, to a greater or lesser extent

"The human memory system consists of four functional components: senses, working memory, long-term memory, and the central processor" [16]. Memory strategies are mnemonics that learners use to create mental links that allow new information, most commonly vocabulary, to enter and stay in long-term memory. Words and phrases can be linked to visual images, which can then be saved and retrieved for communication purposes.

Short-term memory (working memory) refers to the ability to maintain and manipulate information sufficiently in order to complete a specific task such as comprehending, learning, or reasoning [17]. Researchers used to believe that short-term memory was stored separately from long-term memory, but more recent studies show that short-term memory is "best conceptualized as that portion of long-term memory that is temporarily at a heightened state of activation at a specific moment of time[18]".
Short-term memory thus includes the information on which the person is currently concentrating his or her attention, as well as some items that the person is unaware of but which are still activated. It is responsible for both new perceptions and long-term memories. Working memory information must be drawn to attention, or it will fade in about one minute. Absorption is the process of transferring information from working memory to long-term memory.

Short-term memory is the second stage of the Atkinson-Shiffrin multi-store memory model. Short-term memory appears to last between 15 and 30 seconds, with a capacity of about 7 items. There are three main aspects to short-term memory:

1. limited resources (only about 7 items can be stored at a time).
2. Time constraint (storage is very fragile and information can be lost with distraction or passage of time).
3. Encoding (primarily acoustic, even transcribing visual information into sounds) (primarily acoustic, even translating visual information into sounds).

The capacity of a person can be measured in two ways: span and the regency effect.

The number 7 (plus or minus two) is a good indicator of short-term memory capacity. The average adult's short-term memory can hold between 5 and 9 items. Miller [19] proposed this concept, which he dubbed the "magic number 7." He believed that short-term memory could only hold 7 items (plus or minus 2) due to the limited number of "slots" in which items could be stored. Miller, on the other hand, did not specify the maximum amount of data that can be stored in each slot. Indeed, we can store a lot more information in our short term memory if we can "chunk" information together.

According to Atkinson and Shiffrin, the duration of short-term memory appears to be between 15 and 30 seconds. Items can be retained in short-term memory by verbally repeating them (acoustic encoding), which is referred to as rehearsal. Using the Brown-Peterson technique, which involves having participants count backwards in 3 seconds to eliminate the possibility of retrieval.

Isaki [20] worked on Contributions of language and memory demands to verbal memory performance in language-learning disabilities. The researchers wanted to see how adults with language-based learning disorders (L/LD) performed on verbal short-term and verbal working memory tasks compared to normal language controls. Thirty-six adult participants were chosen from the University of Arizona's student population. The L/LD group's participants all had poor language skills and self-reported a history of language impairment, dyslexia, and/or learning disability services. The majority of the L/LD participants were recruited from a university campus center that provides academic support and accommodations to individuals with identified learning disabilities; as a result, these individuals were bound to be experiencing current limitations as a result of their disabilities. Others stated that they had a history of speech, language, or learning disorders but that they were not receiving any academic assistance or services at the time. Individuals in the NL group stated that they had no personal or familial history of language impairment, dyslexia, or learning disability. The L/LD group included 18 adults (7 males, 11 females) with ages ranging from 18 to 29 years (mean age = 20). The control group (NL) consisted of 18 adults (seven males and eleven females) ranging in age from 18 to 41 years (mean age = 21). There were 17 undergraduates and one graduate student in each group. Four of the 18 adults in the L/LD group had comorbid Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADD/ADHD). In the NL group, no one had been diagnosed with ADD/ADHD. Each group consisted of 16 Caucasians, 1 Hispanic, and 2 African-Americans. On the most taxing condition, a verbal working memory task with a high language processing load, statistically significant group differences were discovered. On both the processing and storage components of this task, the L/LD group performed significantly worse than the control group. These findings
supported the hypothesis that adults with L/LD have limited capacity. They show verbal memory deficits only when their capacity limits are exceeded under relatively high combined memory and language processing demands, rather than presenting with a uniform impairment in verbal memory.

Parra [21] conducted a research on Relations among language exposure, phonological memory, and language development in Spanish–English bilingually developing 2-year-olds. Their study included 41 bilingually developing children (21 boys and 20 girls) born in the United States and living in South Florida. They had been exposed to both English and Spanish since birth, according to parental reports, and the less frequently heard language accounted for at least 10% of their input. With an average home language input of 49.9% (SD = 29.1), the balance of language exposure ranged from 10% English and 90% Spanish to 90% English and 10% Spanish. All of the children were described by their parents as learning both languages and producing words in both languages by the age of 22 months. At the start of the study, the children were 22 months old (M = 22.78 months, SD = 0.39). All of the participants were born at full term and had no medical or sensory issues. The data was gathered as part of a larger study of early bilingual development. At 22 months of age, the children's phonological memory skills and the balance of English and Spanish language exposure at home were assessed. At 25 months of age, the size of the productive vocabulary and the grammatical complexity of speech were measured (M = 25.82 months, SD = 0.34). Phonological memory for English-like non-words was found to be highly correlated with that for Spanish-like non-words, and both were linked to vocabulary and grammar in both languages, implying that phonological memory has a language-wide component. There was also evidence of language-specific benefits of language exposure on phonological memory skill, as well as language-specific benefits of phonological memory skill on language development.

According to Goodman [23], reading is important for the following reasons:
1- The most important academic language skill is reading.
2- The single most powerful source of language input has been identified as reading.
3- In ESP situations, it is the most heavily emphasized skill.
4- The impact of whole language theory has also reintroduced reading into the ESL classroom
5- As people pay more attention to writing as a means of self-expression, learning, and output, they are also paying more attention to reading.
6- There is a greater emphasis on reading as a result of the growing interest in making curricula more reflective of the cultural diversity of the student population and the recognition of the importance of one's own literature.
7- In ESL, reading is the most effective method of acquiring literacy.

Smith [24] states that reading involves a “trade-off” between visual and non-visual information... the more that is already known “behind the eyeball”, the less visual information is required to identify a letter, a word or meaning from the text.” In other words, if a reader concentrates more on the visual structure of the words in a printed text, less meaning will be processed. There are various components to reading abilities. Phonemic awareness, phonics, fluency, and vocabulary, according to the Snow [25], are among these components. The understanding that words are made up of a combination of individual sounds is known as phonemic awareness. It also entails the ability to hold on to those sounds, blend them into words successfully, and then separate...
them again. Only as it relates to the written word, phonics is the relationship between a specific letter and its sound. In opaque orthographies like English, where children must learn the spelling of various words, phonics is especially important.

In L2 reading research, cloze tests, multiple choice questions, true-false questions, and recall are all used to assess reading comprehension. Because the processes involved do not reflect the actual reading comprehension process, the cloze test may not be a reliable measurement of reading comprehension. Furthermore, the type of reading task may have an impact on how readers engage with the passage [26].

Abtahi and Khodadadian [27] investigated the effect of vocabulary knowledge and background knowledge on reading comprehension among non-Iranian Persian learners. For that purpose, out of about 100 advanced language learners of the Persian language teaching center of Imam Khomeini International University in Iran, 65 (of both genders) were selected by the researchers. The number of participants was reduced to 46 after a word level test homogenized them (sample population). Following that, this group was divided into two groups of 23 learners, one for vocabulary training and the other for activating prior knowledge. A pre-test was given that included two reading comprehension passages about Iran's culture and history. The unfamiliar words of the test were taught to both groups, and then the same test was administered as a post-test. Their findings showed positive effects of the lexical knowledge on the comprehension of reading passages of non-Iranian Persian speakers while it also showed that activation of the background knowledge has no positive effect on learners' reading comprehension.

Arrington [28] conducted a study evaluating the relations of reading comprehension, decoding, working memory, and attentional control. The study included 1,763 students in grades 6 through 12 from mainstream classrooms across four school districts in the greater Houston area. Students who agreed to be tested on word decoding and general intelligence were screened. Performance on the previous year's administration of the Texas Assessment of Knowledge of Skills (TAKS), the state reading accountability test and a reliable and valid measure of reading comprehension, was used to make the selection. Students were randomly selected from subgroups who met or did not meet benchmark criteria on the TAKS because of poor reading ability. If a student's school designated them as Limited English Proficient, if their reading instructor or English Language Arts instruction was provided by a Limited English Proficient teacher, or if they had a significant disability such as school-identified intellectual–cognitive disabilities, severe behavioral disabilities, or autism, they were not eligible to participate. Each student was tested in a quiet area of the school for two or three sessions over the course of one week, depending on availability, as part of a larger study. A member of the research team administered all tasks in accordance with standardized task administration procedures. The direct and indirect effects of working memory and aspects of attentional control on reading comprehension and decoding were assessed using path analyses. Working memory, sustained attention, and cognitive inhibition all had significant direct effects on reading comprehension, but not on decoding. Working memory and response inhibition had a significant direct effect on decoding, but not comprehension. These findings suggest that decoding and comprehension require different aspects of attentional control.

3- Methods
3.1. Participants
The number of participants that took part in this study was originally 130 EFL learners in Nasr English School in Ardabil, Iran. Out of 130 learners, 60 were selected randomly. To ensure that the level of the participants was all intermediate, the researcher gave a proficiency test to the participants. The participants' age was 12-16 and all were female. All the participants were studying English as a foreign language in the institute.
3.2. Instruments
The following instruments were used in the current study:
1) Oxford Proficiency Level Test
2) Online Oxford Reading Comprehension Test
3.2.1. Oxford Online Reading Comprehension Level Test
In order to assess the learners’ reading comprehension level, the researcher used Oxford Online
Reading Comprehension Level Test. The test was consisted of 20 items with a passage allocated
to it. The participant were given free access to internet in order to fill the test. There were no need
to register in the website. As there was no time limitation in the test itself, the researcher added 30
minutes as the time limitation in order to provide more natural examination situation. During the
test, the participants were not allowed to use any type of dictionaries. After answering all the
questions, the results could be seen in one of the six levels within the Common European
Framework of Reference for Languages (CEFR) that are A1 (elementary), A2 (pre-intermediate),
B1 (intermediate), B2 (upper intermediate), C1 (advanced) and C2 (expert).

3.3. Treatment Material: Short Stories
In order to carry on the research, 30 short stories were used by the researcher as the treatment in
order to investigate the effect of short-term vocabulary knowledge on learners reading
comprehension. As mentioned in chapter2 short-term memory has a close relationship with
vocabulary knowledge in learning a language. Moreover, Short stories are a great resource of
vocabularies within passages that is made for improving learners’ comprehension.
The researcher selected all the stories in intermediate level. All of the storybooks were from well-
known publications of Oxford University Press and Pearson Longman. The researcher selected
different stories in different genres to have more reliable results in the end.

3.4. Treatment Material: The Little Prince
Few stories are as commonly read and adored by both children and adults as The Little Prince
(Figure The beloved classic is beautifully translated by Richard Howard, who captures Saint-
Exupéry's unique and gifted style.
In order to research on the effect of the sort-term vocabulary knowledge on learners’ reading
comprehension, The Little Prince novel were used by the researcher as it’s a long-extended
vocabulary bank that are well written and in intermediate level.

3.5. Treatment Material: The Little Prince Animation
The Little Prince film is a 2015 English-language French-Italian 3D animated fantasy adventure
family drama film directed by Mark Osborne and based on Antoine de Saint-1943 Exupéry's
novella of the same name. This animation was played during the class by the researcher to the
learners beside the printed version as the novel.

3.6. Treatment Material: 504 Flashcards
The last treatment that used by the researcher in order to proceed the research was the book by
Murray Bromberg called: 504 absolutely essential words. It is a self-help guide to the use of 504
words that educated people use on a regular basis. Included are sentences, articles, and exercises
in which the new words are used. The 504 Absolutely Essential Words is broken down into 42
lessons, each with 12 new words. Those words are first presented to you in three sample sentences;
then, the new words appear in a brief passage; and finally, each lesson concludes with a set of
exercises that allow learners to practice using the new words. One of the most important aspects
of the book is that each of the new words is repeated throughout the book so that learners have a
better chance of becoming familiar with it.
3.7. Procedure
First, 130 learners of English as a foreign language in Nasr English School, aged 12 to 16, were chosen at random. Then, out of 130 students, 60 were chosen at random based on a proficiency level test to have a homogeneous group of B1 students. The participants were all female. Of the 60 selected final students, two groups of 30 learners were made up. One group was called as control group and one was called as experimental group. The research intent was concealed for the students in both groups to maintain external validity by controlling the Hawthorne effect. The control group was taught by a colleague, while the experimental group was taught by the researcher herself. The institute teaching schedule was a term of 20 sessions for its classes. The teachers had 19 sessions each term to teach and the 20th session would have been taken for the final exam of the institute.

On the first session of the class, the researcher gave the online reading comprehension test to both classes by the help of her colleague. In order to have the online test, the researcher provided free access to internet for both experimental and control groups. Moreover, the researcher helped the learners who did not have mobile phones to participate in the test by allowing them to use the computers of the institute. In order to prevent any cheating in the test, the researcher asked two other colleagues to help her out with controlling the classroom environment. The same were asked to be considered in the control group class. After finishing the test within 30 minutes, the researcher went on by introducing herself as the new teacher of the class and the new course the learner would have as the syllabus of the institute. The teaching process of the control group class was kept in the traditional method after the pretest.

On the second session, the researcher started her research by introducing 30 different short story books to each learner as the first research material. The learners were told to read and study the story books by themselves as homework. To continue with the research, the second treatment was introduced to the learners. The class was asked to work on the short story books and the 504 Absolutely Essential Words for the rest of the term. The researcher decided to use just 30 minutes of each session to carry on her research as she should teach the syllabus of the institute.

On the 3rd session, the researcher started to teach new words to the learners by the help of the flashcards after her 60 minutes of teaching the syllabus of the institute. As there were 132 flashcards, the researcher taught 9 cards containing 4 up to 6 new words with the definition and examples. To have an effective usage of the flashcards, each card was reviewed and questioned in the further session. The researcher tried to create her very own method of using flashcards inside the classroom as teaching tool as there were no established method in that regard.

The 4th session had flashcard teaching and a sudden quiz of the short story books in written format. The quiz had only one question:
What have you learnt from your story book since reading?
This quiz was to see if the learners studied the books or not. It also gave the researcher a perspective of the learners reading comprehension.

In order to avoid the boring atmosphere of using repeated teaching tools, the 5th and 15th session were held without any research treatments. The 10th session was just used to have another quiz of the short story books with the same question before.

From the 6th session, the researcher introduced another treatment. The Little Prince novel was given to the learners. The learners were told that they would study the novel inside the classroom along the course. Each 6th, 7th, 9th, 11th, 12th, 13th, 14th, 16th and 17th sessions were held having
both flashcards and novel reading in the classroom. After reading the novel in each session, the learners were asked to talk about what they have comprehended randomly the next session.

To accomplish the intention of the research, the researcher used the animation of the Little Prince in sessions 6th, 12th and 17th instead of the novel. The 18th, was held discussing on the novel and animation. After teaching for 18 sessions, the 19th session was used to take the post-test. The same online reading comprehension test as the post-test. Immediately, the researcher gathered all the screenshots of the results to collect the needed data. The control group class had the same test on the 19th sessions, too.

4- Results

The data were analyzed using Statistical Package for Social Sciences (SPSS version 26) software program and summarized in tables based on statistical and practical significance.

4.1. Research Questions

The purpose of this study was to examine the effect of short-term vocabulary knowledge on reading comprehension of Iranian intermediate EFL learners. For this purpose, the following research question was asked:

- Does short-term vocabulary knowledge have any effect on Iranian intermediate EFL learners' reading comprehension?

4.2. Null Hypothesis

In order to deal with the main issue under investigation, the following hypothesis was put forth based on the research questions:

H0: Short-term vocabulary knowledge does not have any effect on Iranian intermediate EFL learners' reading comprehension.

4.3. Testing the Hypothesis

In order to investigate the first research question, it was hypothesized that short-term vocabulary knowledge does not have any effects on learners' reading comprehension. To test this hypothesis, first the mean, the standard deviation and other descriptive statistics of both experimental and control groups on pre and post-tests were calculated separately. Then, for the pre-vocabulary level test, a normality test was run on each control and experimental group to see if the data were normally distributed or not.

<table>
<thead>
<tr>
<th>Table 1-Normality Test of the pre Reading Comprehension Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Pre-Test Control Group</td>
</tr>
<tr>
<td>Pre-Test Experimental Group</td>
</tr>
</tbody>
</table>

The Kolmogorov-Smirnov statistic, as shown in Table 1, evaluates the normality of the distribution of scores using a non-significant result (Sig.), also known as p-value, that can be higher or lower than 0.05. The normality test of the pre reading comprehension test showed that the data distribution is not normal as the p-value was lower than 0.05 (p=0.000 <0.05).

The data of the pre-test were not normally distributed. Therefore, the researcher used Mann-Whitney U test as it is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed.

<table>
<thead>
<tr>
<th>Table 2-Mann-Whitney U Test Results for the pre Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Reading Comprehension Test</td>
</tr>
</tbody>
</table>
In Table 2, the statistics result of Mann-Whitney U Test for the pre-test is presented. The U score was 294.000, the W score was 759.000, the Z score was -2.559, and the Asymp. Sig. (2-tailed) was 0.402.

**Table 3 - Ranks of the Pre Reading Comprehension Level Test**

<table>
<thead>
<tr>
<th>Control and Experimental Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Vocabulary Level Test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>30</td>
<td>25.30</td>
<td>759.00</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>30</td>
<td>35.70</td>
<td>1071.00</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 indicated the mean rank of the pre vocabulary level test. The mean rank of the control group was 25.30. The experimental group had 35.70 as the mean rank.

Same statistical analyses were run for the data of the post-test. Similar to the pre-test, descriptive statistics for the post reading comprehension test was run for the control and experimental groups.

**Table 4 - Normality Test of the Post Reading Comprehension Test**

<table>
<thead>
<tr>
<th>Control and Experimental Groups</th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Reading Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>.412</td>
<td>.648</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>.345</td>
<td>.71</td>
</tr>
</tbody>
</table>

As shown in Table 4, both the control and experimental groups had 0.000 as Sig. Like the pre-test, the p-value for post reading comprehension test was lower than 0.05 in both groups. Similarly, the data distribution was not normal for the post reading comprehension test in both control and experimental groups, too.

**Table 5 - Mann-Whitney U Test Results for the Posttests**

<table>
<thead>
<tr>
<th>Post Reading Comprehension Test</th>
<th>Mann-Whitney U</th>
<th>Wilcoxon W</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>74.500</td>
<td>539.500</td>
<td>-5.874</td>
<td>.000</td>
</tr>
</tbody>
</table>

The researcher used Mann-Whitney U test as the data of the post-test of vocabulary were not normally distributed. As demonstrated in Table 5, the U score was 74.500, the W score was 539.500, the Z score was -5.874, and the Asymp. Sig. (2-tailed) was 0.000 for the post-test.

**Table 6 - Ranks of the Post Reading Comprehension Test**

<table>
<thead>
<tr>
<th>Control and Experimental Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Reading</td>
<td>30</td>
<td>17.98</td>
<td>539.50</td>
</tr>
</tbody>
</table>
In Table 6, the mean rank of the post reading comprehension test was demonstrated. The control group had 17.98 as the mean rank in their post reading comprehension test while the experimental group had 43.02 as their mean rank.

Comparing the results of Mann-Whitney U Test for the control and the experimental group, the W score which is simply the lowest sum of ranks (known as Wilcoxon W) was 759 for pre reading comprehension test while it was decreased to 539.50 in posttest. The Z score for pre reading comprehension test was -2.559 while it was -5.874 in posttest. 

As demonstrated in Table 2 and Table 5, Asymp. Sig. (2tailed) was 0.402 for pre reading comprehension test which was higher than 0.05 while it was lower for the posttest with the Asymp. Sig. (2tailed) of 0.000. Similarly, the U value of the Mann-Whitney test for post reading comprehension test was lower (74.500) than the pre reading comprehension test (294.000).

Considering Table 3 and Table 6, the mean rank for the control group (N=30) was 25.30 in pre reading comprehension test while it reduced to 17.98 in posttest. On the other hand, the mean rank of the experimental group was 35.70 in pre reading comprehension test which was increased in posttest to 43.02.

For the pre vocabulary level test, the p-value was higher than 0.05 that indicated the H0 was correctly hypothesized, as there were no treatments prior to the test. The p-value for the experimental group (0.000) that was lower than 0.05, rejected the H0 that Short-term vocabulary knowledge has no effect on Iranian intermediate EFL learners' reading comprehension. By the same token, the increase in Rank means of experimental group that get the treatments related to short-term vocabulary knowledge while the same was a decrease for the control group that were thought using traditional methods, correctly rejected the H0.

5- Results and Discussion

Based on the findings of this study, it can be concluded that short-term vocabulary knowledge had positive effects on Iranian EFL learners' reading comprehension. As the data showed, the experimental group that received short story books, flashcards, a novel associated with its animated film as the treatment had a better result in the post test than the control group that received no treatments. The results rejected the null hypothesis that short-term vocabulary knowledge has no effect on learners' reading comprehension.

The significance of vocabulary in reading comprehension is both fascinating and perplexing. To be able to build a mental representation of text, that is, to comprehend its meaning, one must first be able to decode the printed message[29].

According to Krashen [30], learners acquire vocabulary by reading extensively for meaning in the target language. He condemns explicit vocabulary presentation because “linguistic competence acquired this way is highly limited” in terms of quantity, usability, and quality of learned vocabulary (Krashen 1989, p. 440). In the present study, the role of vocabulary knowledge was shown to be really important in reading comprehension. It seems that reading comprehension and short-term vocabulary knowledge are related together.

The result of this study approves what Anjomshoa and Zamanian [31] have found about the effect of vocabulary knowledge on reading comprehension of Iranian EFL learners in Kerman Azad university. Their findings suggested that making students aware of their vocabulary knowledge as well as their capacity improves their reading ability by giving them a broader understanding of the
depth of reading comprehension texts. The difference is that they worked generally on vocabulary knowledge while the present study focused on short-term vocabulary knowledge. Moreover, unlike the present research, they did not choose specific level of English learners and preferred to have 81 university students.

The results, also were in line with the findings of Gu [32] while he was investigating the effect of vocabulary knowledge on Chinese English learners’ reading comprehension. The results of the study showed that both breadth and depth of vocabulary knowledge make contributions to reading comprehension; the breadth of vocabulary knowledge had a greater predictive power on multiple-choice reading comprehension than the depth of vocabulary, while vocabulary depth was the stronger predictor of post-reading summary writing. Unlike Gu, the present research just investigated the impact of short-term vocabulary knowledge on reading comprehension.

The findings of the present study are in line with Şen and Kuleli [33]. They tried to investigate the effects of vocabulary size and vocabulary depth on reading performance in EFL context. Unlike the present study, the main focus of their research was on reading performance. In their research the participants were 361 university students with different English language level. In the analysis of their data, linear regression and Pearson correlation statistics were used. The results of their research showed that vocabulary size and vocabulary depth were both significantly correlated to reading performance, but vocabulary depth predicted reading performance better.
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