

An Experimental Investigation on Preparatory Year EFL learners' Vocabulary achievement through Interactive Whiteboard (IWB)

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ABSTRACT :Vocabulary is a vital part of foreign language learning and teaching process and it requires more consideration in terms of appropriate methodological choice in order to facilitate the learning process of foreign language learners. Interactive Whiteboard (IWB), which is now associated with the teaching and learning process in Saudi Arabia, and especially in the EFL classrooms provided motivation for conducting the experimental investigation concerning the effects of Interactive Whiteboard (IWB) on Preparatory Year EFL learners' vocabulary achievement. The study involved two intact groups from the Preparatory Year EFL learners at a Saudi university and were labelled as Treatment and Control groups respectively. The Treatment group was given intervention for seven weeks through the Interactive Whiteboard (IWB) while the control group with the traditional whiteboard. 40 items MCQs type vocabulary achievement test was conducted at the beginning as pre-test and again at the end of the study as post-test. The data achieved was analyzed using the SPSS and the results showed that there was significant difference between the Treatment and control groups in terms of better performance in the vocabulary.

KEYWORDS: *Interactive Whiteboard (IWB), Preparatory Year, Saudi EFL learners, Vocabulary Achievement*

I. INTRODUCTION

Vocabulary is considered as one of the most significant element in language learning process. Researchers in the field of English language teaching characterizes vocabulary as one of most important skills essential for teaching and learning a foreign language [1]. It also provides a strong foundation for the advancement and progress of all the other skills for language learning such as reading, listening, speaking, and writing [2]. The importance of vocabulary has been recognized by Wilkins as "without grammar very little can be conveyed, but without vocabulary, nothing can be conveyed"[3]. Thus, vocabulary is a major tool for the students to allow them to use a foreign language successfully.

Vocabulary as defined by Schmitt is a list of words, usually in alphabetical order and with explanation of their meanings [2]. Nation has defined vocabulary as the knowledge of words and word meanings [4]. Stahl explains that vocabulary knowledge is knowledge; the knowledge of a word not only implies a definition, but also means how that word fits into the world [5]. The linguistic analysis of a word includes a set of properties or features and according to this each word is the combination of its meaning, register, associations, collocations, grammatical behavior, written form (spelling), spoken form (pronunciation) and frequency. Accordingly, mastering a word not only involves learning its meaning only but to learn all the seven different aspects and these properties are termed as word knowledge.

Similarly, Oxford University Press Dictionary defines achievement as a thing done successfully with effort, skill or courage. Achievement means how successfully the learner has acquired command of the materials through the teaching and learning process. Valencia suggests that the achievement test gives a complete and important evidence of the learners correct and valid assessment of their achievement [6]. The purpose of vocabulary assessment is to investigate the learners' advancement in vocabulary learning and to evaluate how adequate their vocabulary knowledge is to meet their communication requirements [7].

Several studies conducted in Saudi context have concluded that Saudi EFL learners are poor at learning the vocabulary and they leave high school knowing only less than one thousand words on average in their EFL classrooms [8, 9, 10]. These researchers further argue that Saudi EFL learners do not have adequate vocabulary and the most unpleasant thing is that they are not even acquainted with the basic vocabulary learning techniques. One of the major reasons for the poor performance of the EFL learners in Saudi Arabia is because of the extensive use of traditional methods of teaching, the most common of which is Grammar-translation method. The EFL learners are given the translation of certain passages and they are asked to memorize certain words with their meanings. This in turn affects their overall performance and skill level in English language learning. Gyllstad has rightly pointed out that developing the learners' vocabulary skills will ultimately facilitate richer listening, speaking, reading and writing abilities [11].

With these challenges in mind and the fact that modern day technologies have gained recognition globally for their success in supporting second language acquisition, Education ministry in Saudi Arabia aim to furnish most educational institutions with modern equipment for integrating technology into the EFL classrooms. One such advancement is the addition of Interactive Whiteboard (IWB) in the EFL classrooms. Keeping in view the curriculum and the course contents, at the Preparatory Year, the Saudi EFL learners are expected to learn and keep adequate vocabulary so that they could be able to successfully complete the Preparatory Year, in order for them to be promoted to the faculty. Technologies, such as Interactive Whiteboard (IWB) in EFL classrooms lead new hopes, for the EFL learners, teachers and the administrators. Yet, being a new technology in Saudi educational domain, it has not been researched thoroughly, and there is a need to explore the effects of Interactive Whiteboard (IWB) on Saudi EFL learners' vocabulary achievement.

II. LITERATURE REVIEW

Vocabulary learning, and teaching has acquired tremendous recognition and appreciation over the last three decades as researchers [4, 12] have tried to find out the important role vocabulary plays in learning a foreign and second language. Before that, vocabulary learning was considered as a matter of mastering the syntactic or morphological content with the help of memorization and repetition and translation [13]. According to Vermeer for a greater period of time, vocabulary learning was considered as an intentional process requiring learners to learn by heart and cram the vocabulary and grammar rules from the lists provided by teachers and publishers [14]. Schmitt states that earlier vocabulary learning was thought to be involved with mapping of a lexical item to its meaning [3]. However, the research has suggested that it is not just the matching of a form to a meaning but involves several other aspects.

Thus, it could be concluded that vocabulary learning, and teaching was a neglected field as it was considered as a messy part of the linguistic competence. Researchers, however focused on the theories related to vocabulary teaching and conducted the studies to understand and imply the processes and techniques which could accelerate and enhance the acquisition of new lexical items for second and foreign language learners. Moreover, with better twiggling of the researchers and academicians, it has been apprehended that vocabulary knowledge is multi-dimensional and include numerous aspects of language learning process, therefore, there is a need to understand the most appropriate methodology, for vocabulary instruction to facilitate the learning process and to enable the learners to have command of vocabulary knowledge.

Vocabulary plays a significant role in the progress and development of the four skills of language i.e. listening, speaking, reading and writing, and according to Hirschel and Fritz, the better understanding of vocabulary is a key to success in the language learning [15]. According to El-Dakhs vocabulary is believed to be a major contributor to learners' performance in English as foreign language teaching and learning process and is also at the heart of foreign language ability [16]. It is an increasingly significant area in applied linguistics research. According to Al-Darayesh, EFL learners with poor vocabulary skills are not only incapable to perform in productive skills but are even unable to understand a simple reading text or an audio script [17].

Achievement in the field of English language teaching and learning is a subject that has been widely studied and researched around the globe. EFL learners have a strong purpose to obtain proficiency in English language and their learning can be measured by students' progress based on the test scores related to curriculum content. In Saudi Arabia, a lot of studies have been conducted to understand the connection between language learning achievement and the factors that could possibly manipulate the academic functioning of the EFL learners such as language learning strategies [18], personality traits and learning patterns [19] and motivation [20]. These studies exhibited that these factors could influence positively or negatively on the EFL learners' achievement, their proficiency level and their role and attitude in their EFL classroom.

In order to investigate the Interactive Whiteboard (IWB) use in vocabulary development of EFL learners' Martin scrutinized the use of the Interactive Whiteboard (IWB) for the vocabulary development of the elementary school children in United Arab Emirates [21]. The researcher used the Interactive Whiteboard (IWB) based lessons to four groups. The data was collected through the observations of the classrooms and the teachers' interviews. The results of the study indicated a positive development of the students. However, it should be noted that the study did not employ the control group and therefore, a comparison could not be demonstrated about the level of development that has been made due to the Interactive Whiteboard (IWB) usage.

A study by Demir explained the effects of vocabulary instruction in-class strategies developed by the researcher on the vocabulary achievement of EFL learners at Turkish secondary schools [22]. The study was experimental in nature and used two groups, Treatment which was taught by using the strategies developed by the researcher, while control group students were taught with the traditional method. The post-test results concluded a significant difference in the vocabulary achievement and retention of the Treatment group students.

A study by Al-Farra also investigated the effectiveness of the Interactive Whiteboard (IWB) in developing 10th graders' vocabulary achievement and retention [23]. The study was conducted at a Palestinian school involving 85 male students. The study employed quasi-experimental pre-test-post-test design. Data was collected through researchers prepared achievement test and an attitude scale. However, the study included the treatment (in this case the use of the Interactive Whiteboard (IWB)) for only two (2) lessons per week. The results of the study revealed that there is statistically significant difference between the scores of the control and Treatment group students in favour of the Treatment group as the Treatment group students performed better in the vocabulary achievement post-test. The study involved the secondary school level students whereas the present study is conducted with the university students registered in the Preparatory Year. The present study also employed the use of the Interactive Whiteboard (IWB) for the whole duration of the study which is six (6) weeks and include 18 hours per week classes.

Keeping in view the importance of vocabulary in language learning; and the fact that language teaching is changing because of the immense use of the technology inside and outside of the classroom, this study tends to investigate the effect of Interactive Whiteboard (IWB) use on Preparatory Year EFL learners' vocabulary achievement at a Saudi university. EFL teachers at the Universities in Saudi Arabia are required to utilize and maintain technological tools in their classrooms to better help and engage their students. Teachers are provided with professional development centred on the use of technology and teachers are seen as up to date in their instructional strategies if they can effectively integrate technology into their classrooms. While many strategies are used to enhance students' interest and engagement in the EFL classrooms, technology is often referred to most and additional research may inform that practice.

The present experimental study has been intended to investigate study the effect of Interactive Whiteboard (IWB) on Preparatory Year EFL learners' vocabulary achievement while learning English at a Saudi University. The investigation could be beneficial for the Preparatory Year EFL Instructors as this program has been initiated in almost all the universities in Saudi Arabia, because of the significant importance of the English language in Saudi Educational domain.

III. RESEARCH QUESTIONS

The key research questions under investigation in this study are as follow:

1. Is there any significant difference between the Preparatory Year EFL Learners of Treatment group and Control group in the results of their post-test Achievement test in terms of performance in vocabulary?
2. Is there any significant difference between the results of the pre-test and post-test Achievement test of the Preparatory Year EFL Learners of the Treatment group in terms of performance in vocabulary?

IV. METHODOLOGY

Achievement test is a significant instrument in academic assessment process and has enormous implication in measuring instructional progress of the students in the subject area. According to Ary, Jacobs, Sorensen, and Walker, they are used to measure what individuals in the research study have learned [24]. Fraenkel, Wallen and Hyun deliberates that the most important advantage of using the achievement test is to get the feedback and evaluation of academic progress [25]. The data collected from achievement test results enable

the researcher to figure out the areas of proficiency and gaps in student learning, and to compare the progress of the two groups, i.e. the Treatment and the control group.

The current research study was accomplished at the English Language Unit (ELU) of a public-sector university in Saudi Arabia. The study utilized a non-randomized control group, Pre-test-Post-Test Design to investigate the effect of Interactive Whiteboard (IWB) on Preparatory Year EFL learners' vocabulary achievement. In the study, two intact groups of the Preparatory Year students enrolled in Pre-Intermediate level were selected and were randomly assigned as Treatment and Control group. The reason for choosing the intact group is, as discussed by Creswell that in certain educational investigation, the researcher does not have full control to make their own group and they have to use the group already formulated by the administration [26]. The current study also prohibited the researcher to formulate his own groups and therefore two intact groups were used to serve the purpose of the study. The study included 61 EFL learners of the Preparatory Year students enrolled in Pre-Intermediate level, out of which 31 students were in the Treatment group while another 30 students were in the Control group.

The Vocabulary achievement test that has been used in this study has been developed by the researcher with the help of two experts from Examination Development Unit (EDU) of the ELU and made up of 40 questions on the 4-choice multiple-choice format. The rationale for developing the test in the form of multiple-choice format is the point that the students are tested and evaluated through this method in their summative assessments and they are quite familiar with this method of testing. Several tests were evaluated to find one that would be more suitable for the Saudi EFL learners in this context, and the 4-choice multiple-choice format was found to be more suitable to serve the purpose of the study. The 4-choice multiple-choice format has also been used in Nation's vocabulary tests.

The achievement test that has been used in the current research study has been divided into two parts. The questions format used a stem plus a 4-choice multiple-choice format. The item stem consists of the word followed by a very simple non-defining sentence containing the word. The non-defining sentence has the roles of (1) indicating the part of speech of the word, (2) limiting the meaning of the word where words may have a homograph or very different senses, and (3) slightly cueing the meaning by presenting an example of use. The words represented by the distracters should fit sensibly within the stem. The vocabulary of the stem (with the exception of the tested word) is within the first 500 words of English.

The distracters are the same part of speech as the correct answer, and in most cases the distracters are the meanings of words from around the same 1000-word frequency level as the correct answer. Non-meaning clues such as the length of the choice, and general versus specific choices have been avoided and have been checked in piloting. The occurrence of the correct answers was spread evenly across the four choices of a, b, c, and d. The test did not use an 'I do not know' choice, because it discourages informed guessing. The learners were also asked to cross-out the options that they considered incorrect. All the vocabulary that have been included in the test are based on the topics that are covered in the syllabus, already designed by Oxford University Press.

The vocabulary achievement test was validated for construct, content and face validity by two workmates and the suggested modifications were made before the test was conducted. Mackey and Gass, consider face validity as a measure which is concerned whether the research instrument appears to measure the construct it is intended to measure [27]. Additionally, to check the reliability of the EFL learners' achievement test Kuder-Richardson Formula 20 (KR-20) was used during the study and it was found to be $\rho_{KR20} = 0.77$. The results showed that the achievement test was reliable and was therefore used in the study.

V. DATA COLLECTION

The study involved two intact groups of the Preparatory Year students, who were enrolled in Pre-Intermediate level, and were randomly assigned to Treatment and Control groups. In order to collect the data for the current research study, vocabulary achievement test was conducted for both the Treatment and Control group students on the first day of the module. Then both the groups were taught the same textbook where the intervention to the Treatment group was provided with the help of Interactive Whiteboard (IWB) while the Control group students were taught with the traditional whiteboard. The intervention continued for seven weeks, and at the end of the intervention, the vocabulary achievement was conducted again with both the groups. The data collected from both the pre-intervention and post-intervention stages were analyzed through the Statistical Packages for Social Sciences (SPSS) for Windows v21. Independent Samples t-test was run to compare the means of the two groups.

VI. RESULTS AND ANALYSIS

The following results developed from the statistical analysis of the data. To answer the first research question, the researcher established the following null hypothesis: Statistically, there is no significant differences at ($\alpha \leq 0.05$) in the mean score between the Treatment group and the Control group in the vocabulary achievement post-test. In order to evaluate this hypothesis, the Independent Samples T-test is used to

measure the significant differences between the Treatment group ($n = 31$), who learned vocabulary through the Interactive Whiteboard (IWB) and the Control group ($n = 30$), who learned in the traditional way. Table 1 recorded the results of the post-test vocabulary achievement test of the Treatment and the control groups.

Table 1: Independent Samples T-test results for Treatment and Control groups

	Group	N	Mean	SD	t	Sig.
Post-test Vocabulary Achievement Test	Treatment	31	26.129	1.962	4.604	.000
	Control	30	21.866	2.745		

As displayed in Table 1, the Sig. value shows that there is significant difference at ($\alpha = 0.05$) in the total mean score of the post-test between the Treatment and Control group, in favour of the Treatment group, who learned vocabulary through the Interactive Whiteboard (IWB). This means we can reject the null hypothesis which says that there is not any statistically significant difference at ($\alpha \leq 0.05$) in the mean score between the control group and Treatment group in the vocabulary achievement post-test. The results thus established the basic fact that using the Interactive Whiteboard (IWB) effectively in the teaching of vocabulary, with all its interesting tools and aids increases the students' interest and thus they participate in learning eagerly when they touch the screen with their fingers which for them seems to be a magic aid. The Interactive Whiteboard (IWB) therefore has a positive impact on the Preparatory Year Saudi EFL learners in terms of vocabulary achievement.

According to Kelly and Preacher, an effect size supplement the statistical hypothesis testing and play an important role in power analysis, sample size planning and in meta-analysis. In effect size, the value indicates the intensity of the effect size [28]. For instance, a larger absolute value indicates a strong effect. Table 2 presents the effect size of the Interactive Whiteboard (IWB) on the vocabulary achievement post-test results of the Treatment and control groups, and clearly indicates that the effect size is medium, signifying the importance of the Interactive Whiteboard (IWB) in EFL learners' vocabulary achievement.

Table 2: The Effect Size of the Interactive Whiteboard (IWB) on the Vocabulary Achievement Post-test of the Treatment and control groups

Test	t	df	η^2	Effect Size
Vocabulary Achievement Post-test	4.604	59	0.26	Medium

To further explore this issue, it will also be very pertinent to look at the basic assumption of the equality of two groups through the analysis of pre-test scores of both Treatment and control groups. It is crucial to establish that both groups were at the similar level of achievement at the start of the experiment. Both Treatment and control groups had almost equal number of participants. The pre-test results of the vocabulary achievement test are presented as follow.

Table 3: Descriptive Statistics of Pre-test Vocabulary Achievement Test

	Group	N	Mean	SD	t	Sig.
Pre-test Vocabulary Achievement Test	Treatment	31	11.871	1.962	.335	.739
	Control	30	11.666	2.745		

Table 3 shows mean score of vocabulary achievement pre-test of the Treatment and control groups. Treatment group mean score was 11.871 which was 29.6 % of maximum score of 40 points, and standard deviation was 1.962 ($M = 11.871$, $SD = 1.962$) for 31 students ($N = 31$). Control group mean score was 11.666 which was 29.1 % of maximum score of 40 and standard deviation 2.745 ($M = 11.666$, $SD = 2.745$) for 30 students ($N = 30$). Standard deviation which is a measure of dispersion of scores from mean score, shows that scores were not widely dispersed.

For mean comparison independent samples t-test was conducted with ($\alpha = 0.05$). The p value ($p = .739$) indicated that there was no statistically significant difference in the mean scores of the Treatment group and the control group. The result confirmed that two groups were at the same level of achievement prior to start of the intervention. Levene's test was performed to satisfy the homogeneity of variances assumption. The results were ($p = .126$, with $\alpha = 0.05$) which meant that variances were homogeneous.

To answer the second research question, the Paired-Sample T-test is used. According to Pallant, a paired-sample t-test is stated to as repetitive measure test and is employed when the data from one group of people is collected on two different occasions or under two different conditions [29]. Pre-test-Post-test experimental design is an example of the type of situation where this technique is appropriate. Each subject under research is reviewed on same continuous measure at time one and then again at time two, subjecting them to some intervention. Thus, a paired-sample t-test discloses whether there is a statistically significant difference between the mean score of pre-test and the post-test.

A paired sample t-test was conducted to evaluate the effect of the Interactive Whiteboard (IWB) on Preparatory Year EFL learners' vocabulary achievement. There was a statistically significant increase in the post test score [$M=25.3871$; $SD=5.463$; $p<.05$] from pre-test score [$M= 9.435$; $SD=2.634$] as shown in Table 4.

Table 4: Paired sample T-test statistics for Treatment Group

	N	Mean	SD	Sig. (2 tailed)	t	df
Pre-test results	31	11.871	1.962	.000	-17.963	30
Post-test results	31	26.129	3.757			

In the Table 4, which provides the Paired Samples T-Test statistics for Treatment group, Sig. (2-tailed) is the probability (p) value. According to Pallant, if this value is less than .05 [29], it can be concluded that there is a significant difference between the pre-test and post test scores of the Preparatory Year EFL learners of the Treatment group. In the current research study, the probability value is .000, and thus the actual value is less than the specified alpha value of .05. Therefore, it can be concluded that there is a significant difference between the two scores.

In statistics, an effect size is a quantitative measure of the extent of a model under discussion. In order to show the range of the Interactive Whiteboard (IWB) effect on the Preparatory Year EFL learners of Treatment group achievement in vocabulary, the research applied the effect size formula as advocated by Cohen [30].

Table 5: The Effect Size of the Treatment with the Interactive Whiteboard (IWB) in the Post-test

Group	t	df	η^2	Effect Size
Treatment Group	-17.963	30	0.91	Large

Table 5 presents the effect size of the Interactive Whiteboard (IWB) on the vocabulary achievement post-test results of the Treatment group, and clearly shows that the effect size is large, signifying the importance of the Interactive Whiteboard (IWB) in Preparatory Year EFL learners' vocabulary achievement.

VII. CONCLUSION

The rationale of the study was to conduct an experimental investigation at a Saudi university in order to explore the effects of the Interactive Whiteboard (IWB) on Preparatory Year EFL learners' Vocabulary achievement. The results of the study are significant as the Treatment group EFL learners, who were given intervention through the Interactive Whiteboard (IWB), showed better performance in their post-test vocabulary achievement test than the learners in the control group who were taught with the traditional whiteboard. The results of the current research study thus indicated that the Interactive Whiteboard (IWB) is useful in developing Saudi EFL learners' vocabulary.

The EFL learners' in the Treatment group notably performed better than the EFL learners' in the control group on the post-test in terms of vocabulary achievement. Moreover, the Treatment group considerably increased its own score on the post-test as compared to the pre-test on vocabulary achievement. The control group, on other hand, could not show substantial improvement in vocabulary on the post-test as compared to the Treatment group. Therefore, it can be established that the Interactive Whiteboard (IWB) has positive effects on vocabulary learning of Saudi EFL learners.

From the results of this study and through the findings of other studies from previous literature the impression has brilliantly established that using technology in general helps the students to achieve better results. Saudi Arabia is investing a lot in Education and especially in modernizing the classrooms and equipping these with the state of the art technologies. According to a report by Saudi Gazette 2015, the Saudi Arabian spending on educational technology is projected to reach USD 125 million in 2016 and is set to grow at a compound annual rate of 33% over the next 5 years. The Interactive Whiteboard (IWB) is an effective tool in teaching all subjects not only English language, it includes many facilities and it is suitable for all levels of students. Recently, in

Saudi Arabia, the use of Interactive Whiteboard (IWB) has increased significantly in schools and it demonstrated its success in the teaching and learning process.

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