Interactive White Boards and Iranian Male high school students' vocabulary breadth

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Abstract: Using technology in education is very common nowadays. Interactive white boards are considered one of the product of this technology. The purpose of this research study was to determine the impact of the interactive whiteboards as an instructional tool on Iranian first-grade high school male students' vocabulary achievement. Fifty first-grade high school male students participated in this study and were divided into two separate groups: one experimental group who were taught through the interactive whiteboards and the control group taught through traditional whiteboard. A vocabulary test used to asses students' vocabulary achievement. The study was based on eight ninety-minute-long sessions (one session each week). Four units including vocabularies were taught during this two-month period. While teaching vocabulary, at first the teacher played the CD that pronounced each new word 3 times and asked students to repeat the words after listening to them. Then, the pronounced word appeared on the screen. Next, if the word was concrete, its picture was displayed on the interactive whiteboard, and finally the new words were used in sentences. The result of pre and post-test indicated that using interactive white boards as a treatment did not have a significant impact on Iranian high school male students' vocabulary achievement when compared to traditional board.

Keywords: Interactive Whiteboard (IWB) or Smart Boards, Vocabulary Breadth, Students' Perception

1. Introduction

Technology has certainly changed the way we live. It has affected different aspects of life. Technology plays an important role in people's life. Many complex and critical processes can be done with ease and greater efficiency with the help of modern technology. Thanks to the application of technology, life has changed, and it has changed for the better (Oak, 2012).

E-learning has many faces in classrooms. Interactive Whiteboard (IWB) is one of many tools of e-learning. IWB is a large touch-sensitive and interactive display that connects to a computer and projector. A projector projects the computer's desktop onto the board's surface, where users control the computer using a pen, finger, or other devices (Gruber, 2011). The interactive whiteboard software allows for teacher-cued animation, equations and word problems that can be retrieved, dragged, and dropped. It can project the information that a teacher highlights, enlarges, and she can record students' feedback. The interactive whiteboard allows

for the creation of collaborative and interactive lessons by combining resources (Gruber, 2011).

Mercer, Hennessy, and Warwick (2010) investigated the effects of using smart boards as a tool on encouraging and supporting classroom dialogues. The authors' concern here was with the promotion of dialogic communications between teachers and students which is widely considered educationally valuable nowadays. They investigated how teachers could use the technical interactivity of the interactive whiteboard to support dialogic interactivity. The design of the study was predicted based on a partnership between the authors and three UK teachers. Outcomes were illustrative examples of teachers' effective strategies for using interactive whiteboards for orchestrating dialogues.

Lopez (2011) conducted a qualitative study to find out whether or not smart boards can be an effective tools to motivate students to learn different subjects.The study indicated that smart boards can have a positive impact on learning and teaching. As this electronic whiteboard is colorful, it can be motivating to students as a visual stimulus.

The research also indicated that it can be used to teach students with limited learning motor skills.

The research aimed at investigating the role of smart boards in improving Iranian high school male students' vocabulary knowledge.

1.1. Literature Review

There are some empirical studies done on the use of interactive whiteboard. The following issues are reviewed: investigating teachers' and students' attitude toward using interactive whiteboard in education, the relationship between smart boards and foreign language learning, smart boards and students' retention, attention, participation, interest and success, smart boards and school students' mathematics.

Through an empirical study, Bell (2000) investigated if smart boards have any effects on writing achievement, writing attitude and computer attitude among 90 eighth graders in junior high school during a sex week period. The experimental group was taught through interactive whiteboards (IWB) projectors and videos while the control group was taught in the traditional way. She concluded that the students' achievement was not different in the two groups based on their post-test but their attitudes towards computer use were improved and consequently their attitudes towards writing changes to the better.

Robinson (2004) investigated the impact of technology on middle school students' mathematics. He investigated using IWBs in teaching a unit on transformation .Two seven grade classes were the participants of this study. One grouped used IWB while the other did not. Results indicated that students' attitude toward IWB and consequently toward learning mathematics were rised although the students' achievement was not statistically different in both groups.

Tate (2004) conducted a study to measure the impact of interactive whiteboards in retention, attention, participation, interest, and success among college students. The participants of this study were American college students who were then divided into two groups: control group worked without electronic whiteboards and experimental group worked with electronic whiteboards. The results revealed that the subjects in the technology-enhanced section self-reported more enthusiasm and interest in the course than did the students in the traditional sections, and as a result, the retention rate in the experimental section was much higher than in the control section.

In their study, Hall and Higgins (2005), investigated the teaching/learning success based on comprehensive installation of IWBs in England. Students' achievement, structured lessons observation, and both teachers' and students' attitudes were the areas under investigation. The results indicated that technology use changes teachers' practice, and they showed that teachers' and students' attitudes were much positive. However, the results indicated that the students' attainment on the national test was very low.

Concerning teachers and students' attitudes toward using technology in education, Mathews-Aydinli, and Elaziz (2010) investigated the attitudes of teachers and students' toward the use of interactive whiteboards in foreign language teaching and learning context. Data were collected through the questionnaire distributed to 485 students and 82 teachers in different institutions in Turkey ranging from primary school to universities. The analysis of questionnaire revealed that both students and teachers have positive attitudes toward using smart boards in language instruction. The results also indicated that the more the teachers use this educational tool, the more likely they like it.

Enayati, Modanloo,and Mir Kazemi (2012) conducted a research in the city of Babol. Participants of this study were 380 teachers. In order to review teachers' attitude in using technology in education, a questionnaire was used. The results indicated that teachers' attitude toward the use of technology was positive and traditional methods can not help learners' requirement and their success in today's society.

1.2. Research Questions

1) Do smart boards help Iranian high school male students significantly improve their vocabulary breadth?
2) Do smart boards lead to a better vocabulary achievement compared to traditional white boards for the Iranian male students at high school?

2. Method

2.1. Participants

50 male students in two different first-grade high schools in Sepidan were the participants of this study. All students and teachers were the native speakers of Persian. The students had studied English for two years before. The students' age range was between 15-16. They came from the same cultural and social background as they were living within the same context. The participants were assigned into two groups: the experimental and control group, each including 25 students.

2.2. Instrument

A vocabulary test for the pre- and post-test used to address whether or not an IWB has any effect on Iranian high school male students' vocabulary achievement during the learning process. The test included 30 items of vocabulary. The test was an achievement test developed by the researcher based on the vocabulary items in the students' high school book. The content was reported to be valid by two experts, and the reliability was shown to be relatively high (r=0.71) through Cronback Alpha Formula.

2.3. Procedure

This study was conducted in two different high schools in Sepidan, Iran. Fifty first-grade high school male students were the participants in this study. The participants of the study were classified into two groups randomly: the experimental group was taught English vocabularies through interactive whiteboards while the control group was taught

with the conventional white boards. The interactive whiteboard or smart board was used by the teacher regularly as the traditional whiteboards. The study was based on eight ninety-minute-long sessions. Four units including vocabularies were taught during this two-month period. IWB was used regularly while teaching new vocabularies in the experimental group. Before the intervention of the treatment, both groups took a pre-test to have their vocabulary knowledge assessed.

While teaching vocabulary, at first the teacher played the CD that pronounced each new word 3 times and asked students to repeat the words after listening to them. Then, the pronounced word appeared on the screen. Next, if the word was concrete, its picture was displayed on the interactive whiteboard, and finally the new words were used in sentences. The instruction took one session each week, within a period of two months, in the second semester of the 2013-2014 academic year. At the end, a vocabulary posttest was used to check the improvement. The teacher in the control group, however, used traditional whiteboards to write the words on and draw the related pictures.

After the treatment, the results of vocabulary pre-test and post-test were compared to determine whether using smart boards had any effect on Iranian high school male students' vocabulary improvement or not. The goals behind the interventions were to test the effect of smart boards on Iranian high school male students' vocabulary achievement.

3. Result

3.1. Smart Boards and Vocabulary Achievement

Table 1. Independent t-test for Comparing the Control and Experimental Groups' Performance in the Vocabulary Pretest

	Test	Mean difference	T	df	Sig. (2-tailed)
Pair 1	Control-Experimental pretest	.366	.269	58	.789

In order to check the homogeneity of students in two groups of experimental and control, an independence t-test between pre-test scores of two groups was taken., Table 1 shows that the mean difference between the control and experimental groups in the pretest (3.66) is not statistically significant (.789 > 0.05), suggesting that both groups were at the same level of vocabulary knowledge at the beginning of the study.

Table 2 shows the results of descriptive statistics including mean and standard deviation of the participants' scores in the vocabulary pretest and posttest in the control and experimental groups.

Table 2. Vocabulary Pretest and Posttest Scores in the Control and Experimental Groups

Group	Test	Mean	SD
Control	Pretest	14.26	5.07
	Posttest	14.90	4.70
Experimental	Pretest	13.90	5.47
	Posttest	14.96	5.02

As shown in the above table, both groups have improved means in their posttest compared to the pretest scores. In the control group, the mean of the pretest score is 14.26 whereas the mean of the posttest score is 14.90. In the same way, in the experimental group, the mean of the pretest is 13.90 while the mean of the posttest score is 14.96. In the control group, the SD of the posttests is lower than that in the pretest score (4.70 vs. 5.07, respectively), and the same is true for the experimental group (5.02 vs 5.47) indicating that in the posttest the scores are more normally distributed around the mean.

The results highlight that both experimental and control groups had some degree of vocabulary improvement; however, to show whether the progress is statistically significant, two paired *t*-tests are performed the results of which are presented in Table 2.

Table 3 shows the results of independent *t*-tests performed to compare control (traditional whiteboard users) and experimental (smart board users) groups' performance in the vocabulary pretest and posttest.

Table 3. Independent t-test for Comparing the Control and Experimental Groups' Performance in the Vocabulary Pretest and Posttest

	Test	Mean difference	T	df	Sig. (2-tailed)
Pair 1	Control-Experimental pretest	.366	.269	58	.789
Pair 2	Control-Experimental posttest	-.066	-.053	58	.368

Table 3 shows that the mean difference between the control and experimental groups in the pretest (3.66) is not statistically significant (.789 > 0.05), suggesting that both groups were at the same level of vocabulary knowledge at the beginning of the study. Likewise, the mean difference between the control and experimental groups in the posttest (-.066) is not statistically significant (.368 < 0.05), demonstrating that the experimental group in which smart boards were used could not outperform the control group which made use of the traditional white boards.

3.2. Smart Boards & Vocabulary Improvement

Table 4. Paired t-test for Comparing the Control and Experimental Groups' Performance in the Vocabulary Pretest & Posttest

	Group	Mean	SD	t	df	Sig. (2-tailed)
Pair 1	Control pretest-posttest	-.63	1.56	-2.218	29	.035
Pair 2	Experimental pretest-posttest	-1.06	4.75	-7.05	29	.000

As the results of the above within-group analysis show, the difference between the performance of the control group in pretest and posttest is significant (.035 < 0.05). Similarly, the difference between the experimental group's performance from the pretest to the posttest is significant (.000 < 0.05). The significant progress observed in the posttest shows that all students, regardless of the group, could, to some extent, improve their vocabulary in this course. However, the progress is more evident in the experimental than the control group as the mean difference between the pretest and posttest shows (-1.06 vs..63).

4. Discussion

Overall, the first research hypothesis stating that *smart boards help Iranian male students at high school level improve their vocabulary breadth* is supported as the results of within-group analysis indicated. The improvement was significant in both groups with the experimental group making more progress than the control group. These findings provided evidence for usefulness of the vocabulary instuction, either through smart boards or whiteboards, which is supported by some other researchers. This finding is empirically supported by few studies done in this area. Riska (2010), however, found that in schools using smart board, students annotated the vocabulary using a dictionary and graphics to define the vocabulary words and smart boards had an impact on their immediate and delayed vocabulary recall compared to the control groups in schools with traditional white boards. Cuthell (2003) observed that PowerPoint demonstrations for grammar and vocabulary work on the whiteboard was very useful, especially for teaching to all boy groups. Phillips (2013) examined the use of the keyword method and the smart board presentation in vocabulary instruction for students with learning disabilities and observed an improvement in all quiz scores of vocabulary acquisition pertaining to word recognition, identification, and application in both reading and social studies.

Concerning the second question, i.e., *the effect of smart boards vs. traditional white boards on vocabulary achievement,* the results of between-group analysis indicated, although some degree of achievement naturally occurred during the course comparing each group's pretest and posttest scores, the achievement was not statistically significant in either groups meaning that application of IWB does not necessarily result in a better vocabulary learning. One reason is that traditional skills required students to look up the words in the dictionary, resort to print materials or guess the meaning of words. But, when smart board technology is applied in the classroom, students find how easy it is to search the definition of new vocabularies and other information using the Internet, and it consequently discourages traditional forms of learning and the effort students used to put to learning new vocabularies that resulted in better retention of words. On the other hand,

gazing at the screen for a long time while students are not asked to write down information, and no discussion on what they see or manipulation of other materials during the smart board activity may result in passive learning (Bianca, n.d) in a way students may learn something but do not know how to use it. So, it is not surprising that using IWB did not lead to a better vocabulary achievement compared to traditional boards. Lack of significant improvement can also be attributed to negative features of such modern tools. Replacing a smart board with a traditional white board may negatively influence what and how students learn due to technology problems. Very few studies have so far tried to investigate the effect of IWBs on vocabulary achievement; however, these findings did not support the findings obtained from other studies. Unlike the present study, students in Phillips' study (2013) showed an increase in their quiz scores of vocabulary acquisition when smart boards were utilized.

5. Conclusion

The study sought to answer the research questions whether smart boards lead to a better vocabulary achievement compared to traditional white boards for the Iranian male students at high school. It was also an attempt to explore if smart boards help Iranian high school male students significantly improve their vocabulary breadth. Based on the result, the following conclusions were drawn: a) the effect of using IWB on improving vocabulary breadth among Iranian high school male students was positive as the results of within-group analysis indicated; b) Using IWB as a treatment did not have a significant impact on students' vocabulary achievement when compared to traditional method as manifested in the comparison of the two groups' mean scores.

Key Terms

Interactive Whiteboard(IWB) or smart boards: It is one of the e-learning tools which is a large touch-sensitive and interactive display that connects to a computer or projector, which reflects the computer desktop onto the board's surface. Users can control information on the screen using a pen, finger, or other devices. The interactive whiteboard software allows for teacher-cued animation, equations and word problems that can be retrieved, dragged, and dropped. It can project the information that a teacher highlights, enlarges, and she can record students' feedback. The interactive whiteboard allows for the creation of collaborative and interactive lessons by combining resources (Gruber, 2011).

Vocabulary breadth: Qian and Schedl (2004) defined vocabulary breadth as the number of words which a learner has at least some superficial knowledge of meaning. Breadth of vocabulary knowledge refers to the number of words a student knows. With native speakers, the objective of many studies has been to measure the number of words that they know in some absolute sense (Shen,2008) whereas with second language learners in this study, the aim is more

narrowly defined in terms of first-grade students' knowledge of vocabulary (vocabulary breadth) of items in their school book .

Students' perception: It refers to students' attitudes toward using IWBs to improve their vocabulary knowledge in the present study.

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