



The Influence of Using Interactive Whiteboard on Learner Achievement in the Language Classroom: A Case Study

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Abstract

Sustained engagement and increased attention in the language classroom enhances interactivity which leads to a higher degree of understanding by all learners in the learning setting. Motivation and learner engagement are essential ingredients in language learning that stimulate learners for better performance. Language learning in an interactive learning environment leads to achievement and interactive whiteboard has the potential to motivate language learners for an effective learning. This study investigated the influence of interactive whiteboard in the language classroom and found that learners showed better achievement in the language classroom when interactive whiteboard was employed. This study revealed that learners who had instruction with interactive whiteboard achieved better in language tests than the students who had traditional instruction.

Keywords: Interactive Whiteboard, Interactivity, Motivation, Engagement, Achievement

Introduction

Since 1970s many researches have been conducted to determine the effects of Interactive Whiteboard (IWB) compared to traditional instruction (Morrison et al., 2010). In particular, a large research project focused on the integration of IWB into classroom instruction in 2000s. Today rather than the teacher-led lecture method of instruction, IWB supported teaching has become the suggested method of instruction in all classrooms. Traditional boards are being replaced by IWB for their effectiveness (Lewin et al., 2008), and IWB, which is considered as a modern teaching method, has become a part of many classrooms and met pedagogical needs of learners to a significant extent in today's class environment. IWB with its supportive role has enhanced the teaching and learning process and has proved to be the framework for the methodology. The impact of IWB on learner achievement is the foundation of this study.

Literature Review

With the advent of education technology tools, classroom practice has been changing to a significant extent by creating an interactive, collaborative, learner-oriented and discussion-based learning environment (Prensky, 2007). A wide base of literature related to technology in education has investigated the role of technological tools on learner achievement. IWB, though relatively new as an instructional tool in the classroom, has proved itself effective on learner achievement. There has been considerable research conducted to investigate the effectiveness of IWB on learning styles, learner motivation, and interactivity which form the basic components of learner engagement. In social cognitive theory Vygotsky (1978) argues that instruction is most efficient when learners are engaged in activities in a supportive learning environment. The use of IWB encourages interactivity and collaborative learning (Bell, 1998). This idea is supported by Glover, Miller, Averis and Door (2007) who state that when teachers employ IWB as an educational tool in the classroom they "become more aware of the nature of interactivity and its stimulation as the basis for conceptual development and cognitive understanding" (p.17).

By the same token, constructivism, a theory of knowledge, emphasizes involvement in the learning process. Supporting this idea Alexiou-Ray, Wilson, Wright & Peirano (2003) focus on the learning process by actively participating in meaningful experiences through the use of IWB which "emphasized a more constructivist approach in which students are actively learning with 'real world' implications" (p.73). Both social cognitive theory and



constructivism put an emphasis on collaboration and interactivity to facilitate understanding in the learning process.

Interactivity incorporates a variety of instructional strategies to learning. In a study by Smith, Hardman, and Higgins (2006) it was found that the use of IWB increased engagement in the classroom and offered more opportunities for whole-class teaching. Levy (2002) in her study investigated the impact of IWB on interactivity and found that interaction between teacher and student was triggered by discussions, participation and questions when IWB was employed in the learning environment. In another study by Gerard, Greene and Widener (1999) it was explored that IWB enhanced conversation between teacher and student which contributed to interactivity to a significant extent in the classroom.

Schut (2007) conducted a study on the use of IWB and her results indicated that IWB is engaging since it provides a wide range of visual materials which facilitate remembering things with ease. Moreover, the potential of applying various learning styles with IWB can meet the needs of each student for better achievement.

Motivation and learner engagement are essential ingredients in learning and these aspects are indicatives of effective learning. Weimer (2001) in his study indicated increased motivation when IWB is used in the classroom. Similarly, Berque (2004) in her study reports greater learner engagement with IWB use. Engagement and motivation invigorate achievement. Beeland (2002) advocating this idea found in his study that IWB notably raises learner achievement.

Research Questions

1. Does integration of IWB into classroom instruction produce better motivation, engagement, and interactivity in the classroom?
2. Does the use of IWB increase learner achievement?

Research Methodology

Design of the Study

This study employed both qualitative and quantitative methods at the same time. Qualitative approach was used in this study by drawing meaningful results from test scores of learners to determine the influence of IWB on learner achievement. Quantitative approach allows reporting data results, which were obtained from tests students had on a regular basis, in numerical terms to measure the credibility of research findings.

Sample Selection

The target population in this study is students of English language teaching department at Ishik University. First year students were used in this study. Two groups of learners were created each of which included 20 students so totally a number of 40 students were selected. The students had a proficiency test after they were admitted to the university. It was assured that all learners had the same level of language proficiency to obtain credible results in this research for that reason students who had a score between 70 and 74 were placed in the control group and those who had a score between 65 and 69 were placed in the experimental group. The students were not informed that they were a part of the experiment.

Data Collection

The study investigated the impact of using IWB on learner achievement thus for six weeks while classroom instruction was provided for control group by traditional methods, it was provided for experimental group by the use of IWB in different classrooms. To explore the development of students, they had tests in every two weeks. Both groups had the same subjects in their classes and the same questions in the language tests during the experiment. The topics covered in the classes were the English tenses, if conditionals and modals. In the control group these subjects were taught using traditional instruction. Simply put, the



grammatical rules were explicitly taught based on teacher-centered approach. To ensure that the grammatical patterns were grasped by the students, handouts were distributed and the questions were done in the classroom through providing explanations if needed. On the other hand, IWB was used in the experimental group. The students studied all topics through presentations on IWB. The potential of IWB enabled the students to have more exercises in the classes. The collected data has been analyzed by Statistical Package for the Social Sciences (SPSS).

Findings

Table 1: Scores of students in both groups in tests

	IWB Supported Instruction			Traditional Instruction		
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Student 1	86	92	94	78	80	82
Student 2	84	88	92	76	78	82
Student 3	84	88	90	72	74	78
Student 4	82	84	88	70	72	76
Student 5	78	82	84	68	70	74
Student 6	76	78	82	64	66	68
Student 7	72	76	80	62	64	66
Student 8	72	74	78	60	62	66
Student 9	70	74	76	58	60	62
Student 10	70	74	76	56	58	60
Student 11	68	72	74	56	58	62
Student 12	66	70	72	54	58	60
Student 13	64	68	72	54	56	60
Student 14	62	66	70	52	54	56
Student 15	60	64	68	52	56	58
Student 16	56	60	64	50	54	56
Student 17	56	58	62	50	52	54
Student 18	54	56	60	50	54	56
Student 19	52	56	60	48	52	56
Student 20	48	52	58	46	50	54

Table 1 shows the test scores of students in the experimental group and the control group. While students in the experimental group had classroom instruction with IWB, students in the control group had classroom instruction by traditional methods. When test scores of students are examined, it is seen that students in the experimental group had better results in all tests. These scores yield that the use of IWB in the language classroom played a key role in language learning achievement.

Table 2: Paired Samples Statistics

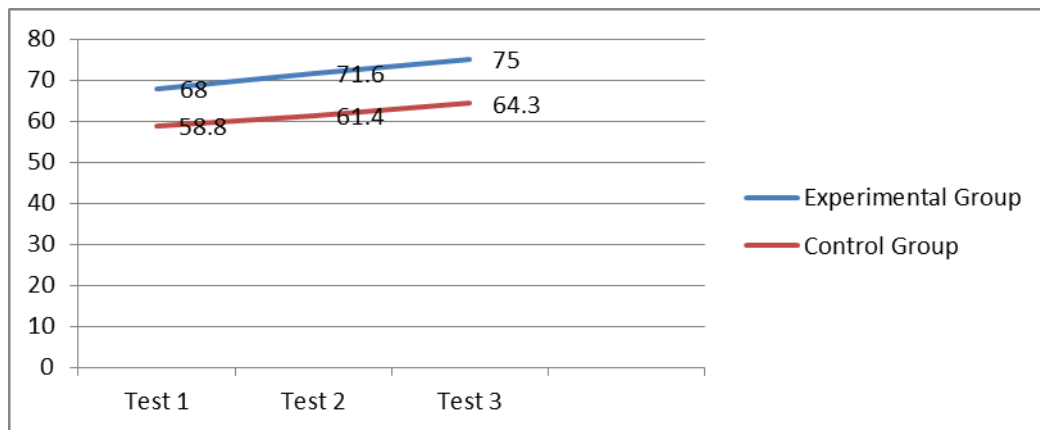
	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 IWB_Test_1	68.0000	20	11.46161	2.56289
IWB_Test_2	71.6000	20	11.67273	2.61010
Pair 2 IWB_Test_2	71.6000	20	11.67273	2.61010
IWB_Test_3	75.0000	20	11.07867	2.47727
Pair 3 Traditional_Test_1	58.8000	20	9.61140	2.14917



	Traditional_Test_2	61.4000	20	9.06352	2.02666
Pair 4	Traditional_Test_2	61.4000	20	9.06352	2.02666
	Traditional_Test_3	64.3000	20	9.34204	2.08894

Table 2 has generated descriptive statistics for the variables. In the Paired Samples Statistics Box, the mean for the experimental group IWB (IWB supported teaching) test 1 is 68, the mean for the IWB test 2 is 71.6, and the mean for IWB test 3 is 75. The mean for the traditional test 1 is 58.8, the mean for the traditional test 2 is 61.4 and the man for the traditional test 3 is 64.3. The number of participants in each condition (N) is 20.

Table 3: The achievement of students in tests



Both table 3 and table 4 reveals that the mean differences between tests are higher in experimental group which indicates that the improvement of students in tests is greater in the experimental group.

Table 4: Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	IWB_Test_1 - IWB_Test_2	-3.60000	1.04630	.23396	-4.08968	3.11032	15.387	.000	
Pair 2	IWB_Test_2 - IWB_Test_3	-3.40000	1.14248	.25547	-3.93470	2.86530	13.309	.000	
Pair 3	Traditional_Test_1 - Traditional_Test_2	-2.60000	.94032	.21026	-3.04009	2.15991	12.365	.000	
Pair 4	Traditional_Test_2 - Traditional_Test_3	-2.90000	1.02084	.22827	-3.37777	2.42223	12.704	.000	

The Sig. (2-Tailed) value in our example is 0.000 (If Sig < .01, then the model is significant at 99%). It can be concluded that there is a statistically significant difference between the mean teaching with IWB and teaching with traditional methods. Since the Paired Samples Statistics box revealed that the mean number of experimental group tests was greater than the mean for



the control group tests it can be concluded that the use of IWB is significantly more effective on learner achievement than the use of traditional methods.

Table 5: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Traditional_Test_1	Between Groups	1673.867	4	418.467	77.176	.000
	Within Groups	81.333	15	5.422		
	Total	1755.200	19			
Traditional_Test_2	Between Groups	1481.067	4	370.267	69.657	.000
	Within Groups	79.733	15	5.316		
	Total	1560.800	19			
Traditional_Test_3	Between Groups	1560.267	4	390.067	59.745	.000
	Within Groups	97.933	15	6.529		
	Total	1658.200	19			

This is the table that shows the output of the ANOVA analysis and whether there is a statistically significant difference between the group means. It is seen that the significance level is 0.000 for all means (If Sig < .01, then the model is significant at 99%) therefore, there is a statistically significant difference between the means for traditional tests.

Table 6: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
IWB_Test_1	Between Groups	2380.133	4	595.033	77.033	.000
	Within Groups	115.867	15	7.724		
	Total	2496.000	19			
IWB_Test_2	Between Groups	2456.933	4	614.233	69.870	.000
	Within Groups	131.867	15	8.791		
	Total	2588.800	19			
IWB_Test_3	Between Groups	2249.333	4	562.333	102.036	.000
	Within Groups	82.667	15	5.511		
	Total	2332.000	19			

This is the table that shows the output of the ANOVA analysis and whether there is a statistically significant difference between the group means. It is seen that the significance level is 0.000 for all means (If Sig < .01, then the model is significant at 99%) therefore, there is a statistically significant difference between the means for IWB based instruction.

Discussion and Conclusion

IWB has become an integral part of education recently. Particularly its support for interactive teaching has been highlighted in many researches (Hennessy et al., 2007). Fun and enjoyment IWB has brought to daily lessons through the use of visual images is combined with heightened learner engagement, a key factor which likely leads to motivation and motivated learners tend to achieve more success. IWB has the potential to assist instructors in their efforts to motivate and maintain learner engagement.

The inclusion of interactivity into classroom instruction maximizes motivation (Martin, 2007). A great many researches has revealed the link between motivation and achievement



(Weimer, 2001). From this point of view, the use of IWB in the learning setting augments learner achievement (Lewin et al., 2008).

A study conducted by Oleksiw (2007) found that students achieved better on their state test when instruction was provided with IWB. In another study by Dill (2008) it was revealed that IWB was positively associated with student achievement. Swan, Schenker and Kratcoski (2008) investigated the influence of IWB on learner achievement and they found that students showed higher performance in the classroom where IWB was used.

By the same token, this study yielded that the use of IWB greatly impacts learner achievement in the language classroom. Compared with the results of learners who were exposed to traditional instruction, learners who had instruction with IWB showed better performance and achieved better in the tests. The use of visual materials facilitated the comprehension of materials and at the same time motivated learners towards better learning.

This study found that learning outcomes increased with IWB instruction. Students developed positive attitudes towards language learning when learning setting is equipped with IWB. Attention and motivation infused learners to get involved in the learning process actively. This engagement allowed learners to perform better in language tests.

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