CHAPTER IV

FINDINGS

This chapter presents the results of the current study which used a Pre-Post Experimental design with a quantitative method approach to explore the effects of the use of Interactive Whiteboard on the achievement and attitudes of EFL secondary students in EFL writing classes at English First Kediri. Six adult classes at the private school were surveyed. The data were collected from students‘ essays and 3 questionnaires administered to 134 EFL students consisting of 69 participants enrolled in control classes and 65 ones enrolled in experimental classes.

The purpose of this study was to investigate the impact of the use of IWB in pre-writing activities on the writings of EFL students at English First Kediri and their attitude towards the writing class.

The present study addressed the following questions:

1. Does the use of Interactive Whiteboard in pre-writing instruction improve the development of ideas in the writings of EFL students?
2. Does the use of Interactive Whiteboard in pre-writing instruction lead EFL students to use topic-related vocabulary words properly?
3. Does the use of Interactive Whiteboard in pre-writing instruction boost the attitude of EFL students towards writing?

A. Quantitative Findings of Research Question 1

Quantitative data needed to answer Research Question 1 were collected from two sources: Pre-Test Post-Test scores with respect to the development of ideas of participants in experimental and control groups in the experimental group regarding the development of ideas after the implementation of IWB pre-writing instruction.

1. Data Analysis of the Pre-test1 Post-test1 Scores with respect to the Development of Ideas after the IWB Pre-writing Instruction

To find out if the use of IWB in pre-writing activities improved participants‘ performance regarding the development of ideas in essay writing, the researcher used two independent samples t-tests. The first independent samples t-test examined whether there was a significant difference in performance between the mean value of Pre-test1 scores of participants in the control group and that of Pre-test1 scores of participants in the experimental group, and the second independent samples t-test inspected if there was a significant difference in performance between the mean value of Post-test1 scores of participants in the control group and that of Post-test1 scores of participants in the experimental group. Also, the researcher used two paired in conducting the t-tests, the researcher had to check the assumption of normality and that of variance by using the Shapiro-Wilk test that tested whether the control and experimental level of the independent variable were statistically normal or not, by examining the Q-Q plots, histograms, and boxplots that displayed the degree of normality of the

aforementioned levels of the independent variable graphically, and by using the Leven‘s Test for Equality of Variances that tested the variance of each level of the independent variable.

Regarding the normal distribution of Pretest1 scores of control and experimental levels, the results of the Shapiro-Wilk test with an a priori alpha level of .05 displayed in Table 4 showed that $p > .05$ for the control group and $p > .05$ for the experimental group which means that neither the control group level nor the experimental group level was significant, and as such, the researcher considered both levels of the independent variable to be normally distributed. Therefore, the researcher rejected the Alternative Hypothesis ($p < 0.05$) that there was a significant departure from normality, and as such, she concluded that the assumption of normality has been met.

Table 1

Test of Normality of Pretest 1 Scores (Ideas)

	Group	Shapiro-Wilk		
		Statistic	Df	Sig.
Pre-test1 scores (ideas)	C	.96	69	.057
	E	.97	65	.124

In order to determine normality of Pretest1 scores graphically, the researcher examined the histograms and Q-Q Plots of the control and experimental groups. A further illustration of normal distribution of Pretest1 scores of both groups is displayed in the boxplots (Appendix H1). As revealed in the histogram of Pretest1 scores of the control group (Figure 1) and that of the experimental group (Figure 2), the data of both groups were normally distributed.

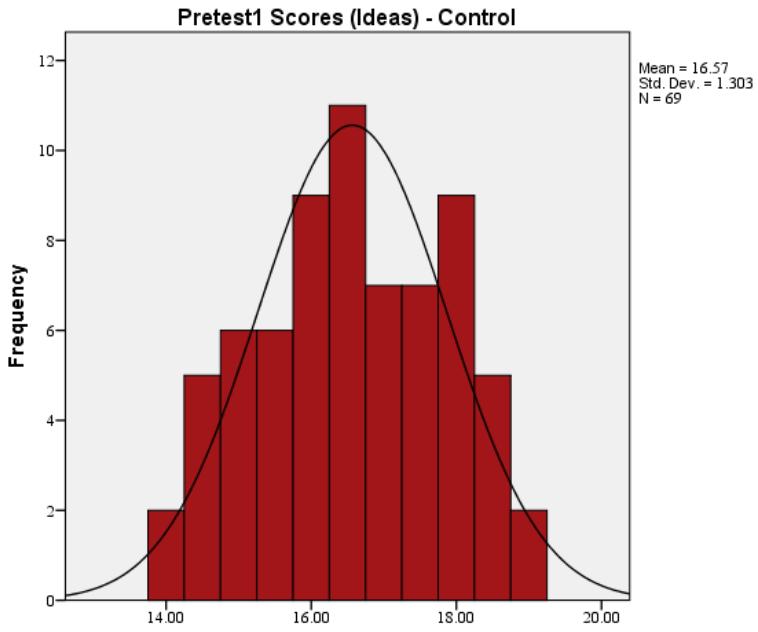

Figure 1. Histogram of Pretest1 scores (ideas) of the control group

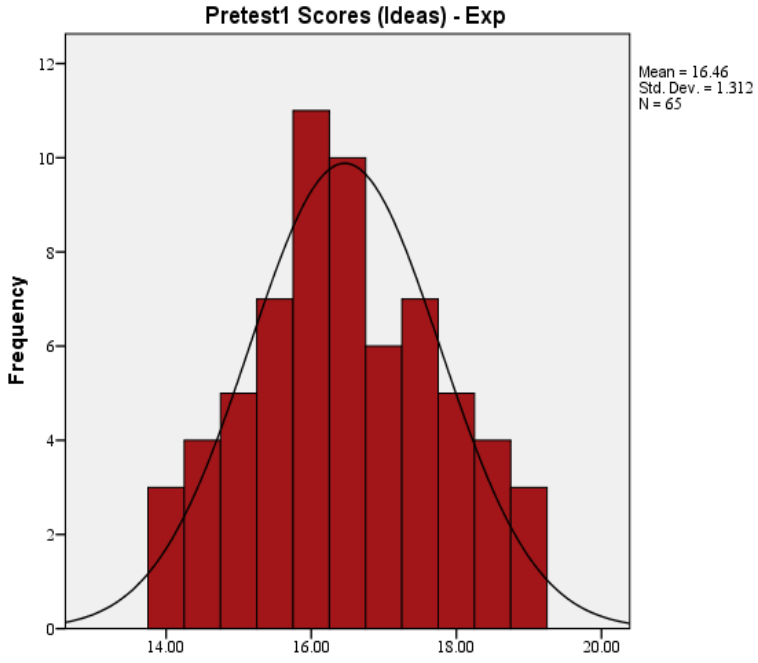

Figure 2. Histogram of Pretest1 scores (ideas) of the experimental group

As to the normal Q-Q plots of the Pretest1 scores (ideas) of the control group and those of the experimental group displayed in Figures 3 and 4 below, we found that the data were closely located along the diagonal lines, the thing which proved that the assumption of normality has been met in both groups.

Figure 3. Normal Q-Q plot of Pretest1 scores (ideas) of the control group

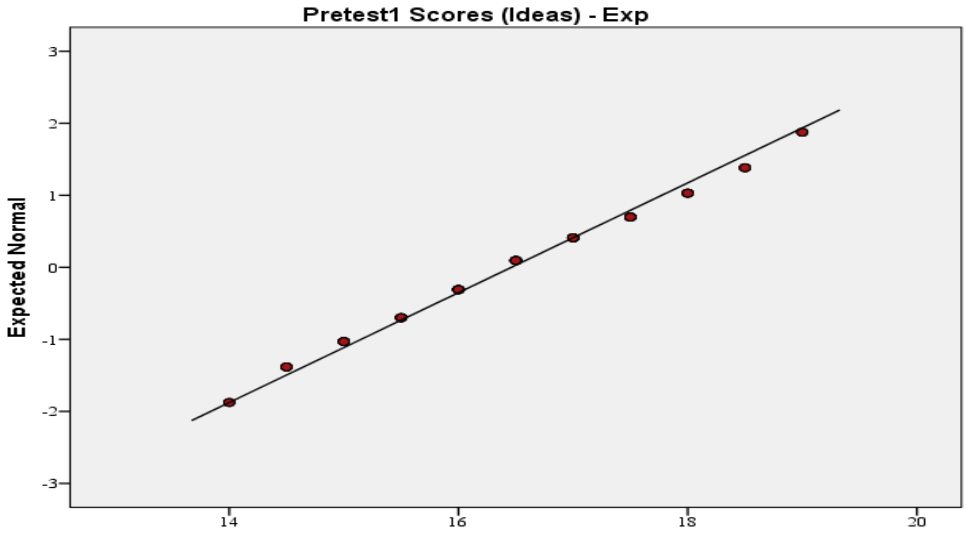

Figure 4. Normal Q-Q plot of Pretest1 scores (ideas) of the experimental group

To examine the assumption of homogeneity of variance for Pretest1 scores (ideas) variable, the Levene‘s Test was used with the level of significance α= .05. As table 3 indicates, the result shows that P (F=.02; p>.05) = .89. As such, the Alternative Hypothesis (H_1: $\sigma_1^2 \neq \sigma_2^2$) was rejected for the assumption of homogeneity of variance and concluded that there was nosignificant difference between the two group‘s variances. Hence, the assumption of homogeneity of variance was met, so the researcher proceeded with the t-tests.

Table 2 shows that there was not a significant difference in descriptive statistics of Pretest1 scores (ideas) between the control group (M=16.56, SD= 1.30) and the experimental group (M=16.46, SD=1.31).

Table 2

Descriptive Statistics of Pretest1 Scores (Ideas)

	Group	N	*M*	*SD*	Std. Error Mean
Pretest1.Ideas	C	69	16.56	1.30	.15
	E	65	16.46	1.31	.16

Note: *M*: Mean *SD*: Standard Deviation

The result of the independent samples t-test indicated that there was not a significant difference between the experimental and control groups in the pretest1 scores with respect to ideas P (t(132) = .45, df = 132) > .05 using an alpha level of .05 as revealed in Table 6. Thus, the Alternative Hypothesis H_1:$\mu_{Control} \neq \mu_{Experimental}$ was rejected in favor of the Null Hypothesis H_0:$\mu_{Control} = \mu_{Experimental}$.

Table 3

Independent Samples Test of Pretest1 Scores (Ideas)

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
							Lower	Upper
Pretest1.ideas	Equal variances assumed	.02	.89	.45	132	.64	-.34	.55
	Equal variances not assumed			.45	131.41	.64	-.34	.55

Another independent samples t-test was carried out with an alpha level of .05 to examine if there was a significant difference in performance after the IWB treatment. However, before conducting it, the researcher examined the assumptions of normality and homogeneity of variance of Posttest1 scores by using the Shapiro-Wilk test and Levene's Test for Equality of Variances and examining the histograms, Q-Q plots and boxplots of Posttest1 scores. The results of Shapiro-Wilk test with an a priori alpha level of .05 demonstrated in Table 4 showed that $p > .05$ for the control group and $p > .05$ for the experimental group which means that both levels of the independent variable were normally distributed. Therefore, the researcher rejected the Alternative Hypothesis ($p < 0.05$) that there was a significant departure from normality, and as such, she concluded that the assumption of normality has been met.

Table 4

Test of Normality of Post-test1 (ideas)

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Post-test1 (ideas)	C	.98	69	.69
	E	.96	65	.10

With respect to the graphical normality of data, an examination of the histogram of Posttest1 scores of the control group (Figure 5) and that of the experimental group (Figure 6) evidenced that the data of both groups were normally distributed.

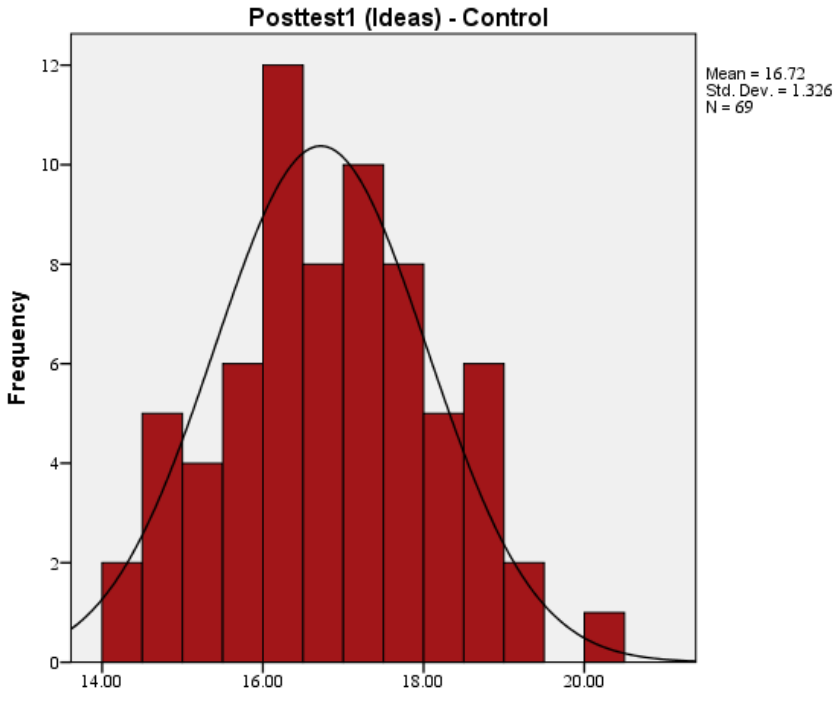

Figure 5. Histogram of Posttest1 scores (ideas) of the control group

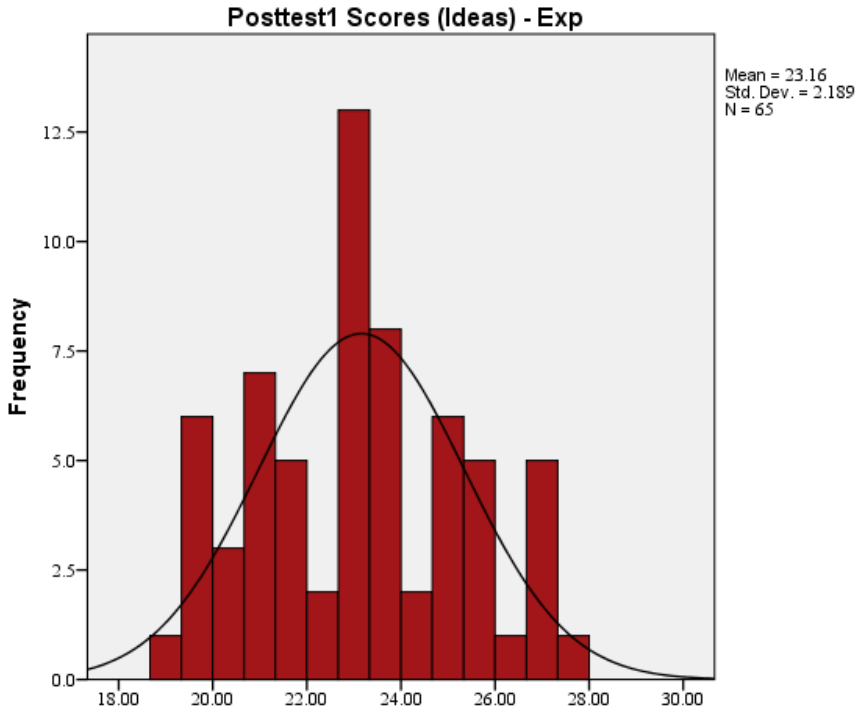

Figure 6. Histogram of Posttest1 scores (ideas) of the experimental group

As to the normal Q-Q plots of the Posttest1 scores of both groups, Figures 7 and 8 ascertained normality of data in both groups. Boxplots of Posttest1 scores of both groups (Appendix H1) provided further cross validation of normality of data.

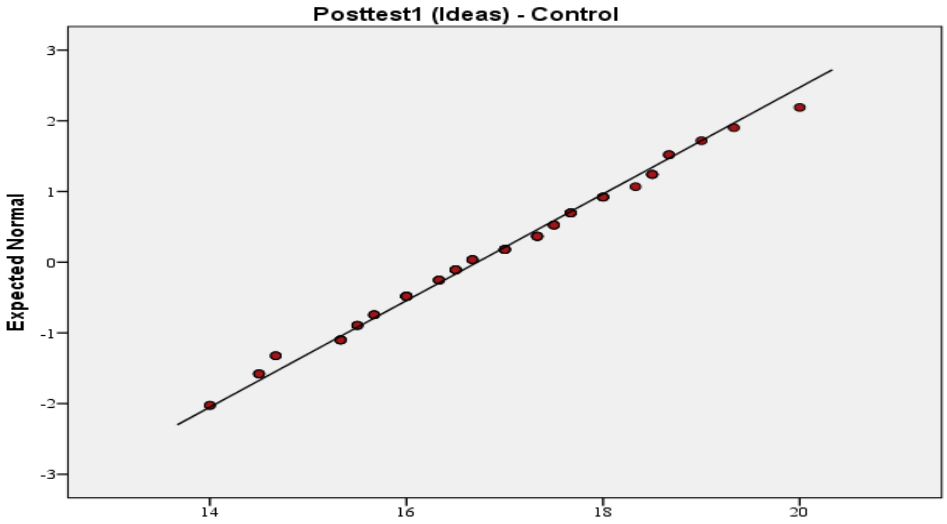

Figure 7. Normal Q-Q plot of Pretest1 scores (ideas) of the control group

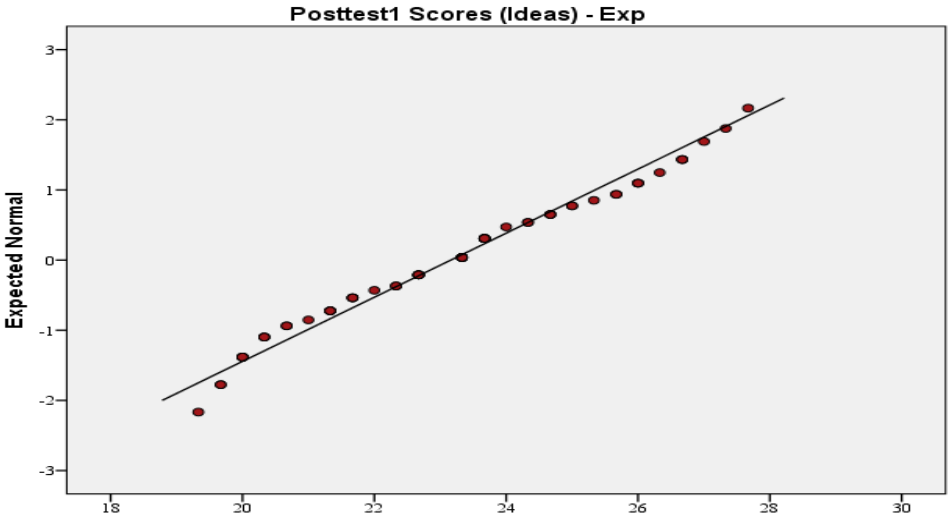

Figure 8. Normal Q-Q plot of Pretest1 scores (ideas) of the experimental group

To examine the assumption of homogeneity of variance for Pretest1 scores (ideas) variable, the Levene‘s Test was used with the level of significance $\alpha = .05$. As table 8 indicates, P ($F= 15.87$; $p<.05$) = .00. As such, the researcher rejected the Null Hypothesis (no difference) and retained the Alternative Hypothesis (H_1: $\sigma_1^2 \neq \sigma_2^2$) for the assumption of homogeneity of variance and concluded that there was a significant difference between the two group‘s variances. Hence, the researcher used the data results associated with the Equal variances not assumed, which takes into account the Cochran & Cox (1957) adjustment for the standard error of the estimate and the Satterthwaite (1946) adjustment for the degrees of freedom. In other words, the researcher used the bottom line of the t-test for equality of means results table and ignored the top line of information. Accordingly, as indicated in Tables 5 and 6, the results of the independent samples t-test showed that after the IWB treatment, the experimental group (M = 23.15, SD = 2.18) outperformed the control group (M = 16.71, SD = 1.32) in

writing achievement P (t (104.20) = -20.44, df = 104.20) < .05 with a 95% confidence interval of the difference ranging between -7.06 and -5.81. The effect size of improvement d = -3.53, which suggests a highly significant gain in achievement from an educational point of view (see Table 9). Thus, the Null Hypothesis H_0 : $\mu_{Control}=\mu_{Experimental}$ was rejected in favor of the Alternative Hypothesis H_1 : $\mu_{Control}\neq\mu_{Experimental.}$

Table 5

Descriptive Statistics of Posttest1 Scores (Ideas)

	Group	N	*M*	*SD*
posttest1.ideas	C	69	16.71	1.32
	E	65	23.15	2.18

Note: *M*: Mean *SD*: Standard Deviation

Table 6

Independent Samples Test of Posttest1 Scores (Ideas)

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
							Lower	Upper
posttest1.ideas	Equal variances assumed	15.87	.000	-20.73	132	.000	-7.05	-5.82
	Equal variances not assumed			-20.44	104.20	.000	-7.06	-5.81

The researcher, also, carried out two paired samples t-tests with the level of significance α= .05. The first was to examine if regular pre-writing instruction enhanced the development of ideas in the essay writings of students in the control group, and the second was to inspect whether the IWB pre-writing instruction

improved the development of ideas in the essay writings of students in the experimental group. As indicated in Tables 7 and 8, there was not a significant difference ($p > 0.05$) between Pretest1 scores of students in the control group before receiving pre-writing instruction (M = 16.56, SD = 1.30) and Posttest1 scores of participants in the control group after receiving regular pre-writing instruction (M = 16.71, SD = 1.32).

Table 7

Paired Samples Test of Pretest1 Posttest1 Scores (Ideas) of Control Group

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Lower	Upper			
Pair 1	pretest1ideas.C - posttest1ideas.C	-.33	.02	-1.74	68	.08

Table 8

Descriptive Statistics of Pretest1 Posttest1 Scores (Ideas) of Control Group

		N	*M*	*SD*
Pair 1	pretest1ideas.C	69	16.56	1.30
	posttest1ideas.C	69	16.71	1.32

Note: *M*: Mean *SD*: Standard Deviation

In contrast to the above results, Table 9 showed an increase in the mean value from Time1 (M = 16.46, SD = 1.31) to Time 2 (M = 23.15, SD = 2.18) in the participants‘ performance after receiving the IWB pre-writing instruction. The paired samples t-test yielded a value of P ($t (64) = -36.06$, $df = 64$) < 0.05 which suggests a gain in achievement with a 95% confidence interval ranging from -7.06 to -6.32 as indicated in Table 10.

Table 9

Descriptive Statistics of Pretest1 Posttest1 Scores (Ideas) of Experimental Group

		N	*M*	*SD*
Pair	pretest1ideas.Exp	65	16.46	1.31
	posttest1ideas.Exp	65	23.15	2.18

Note: *M*: Mean *SD*: Standard Deviation

Table 10

Paired Samples Test of Pretest1 Posttest1 Scores (Ideas) of Experimental Group

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Lower	Upper			
Pair	pretest1ideas.exp - posttest1.ideasexp	-7.06	-6.32	-36.06	64	.00

2. Data Analysis of the Performance Questionnaire with respect to the Development of Ideas after the IWB Pre-writing Instruction

To cross-validate the aforementioned analyses of Pretest1 Posttest1 scores with respect to idea development of the participants in the control and experimental groups, seven questionnaire items on the written performance of the participants in the experimental group with respect to idea development in essay writing after receiving the IWB pre-writing instruction were examined and analyzed using SPSS. All the questions were stated positively when the IWB was used except one question (Q9) stated negatively. As Table 11 shows, the majority of participants disagreed that the pre-writing activities in the Interactive Whiteboard distracted them from developing their ideas during writing (M= 2.05, SD=1.06). On the other hand, around two thirds of the participants (f=42) agreed

and one third of them (f=19) strongly agreed that the pre-writing activities in the Interactive Whiteboard increased their knowledge about the writing topic (Q1). Moreover, more than half the participants (f=37) agreed and around one third of them (f=23) strongly agreed that they were able to develop their ideas better during writing because of the diagrams, charts, and webs displayed via the Interactive Whiteboard (Q3).

Similarly, almost all participants reported that they become more able to support the main ideas in their writings after the pre-writing activities used in the interactive Whiteboard (Q4), and they agreed that the pre-writing activities in the Interactive Whiteboard helped them in remembering the main ideas of the topic during writing (Q5) and made them get rid of the mental block that they used to suffer from when they started writing (Q8). Regarding the responses of the last question, although around two thirds of the participants agreed that they no more needed much time to write down their ideas after the Interactive Whiteboard pre-writing activities, one participant strongly disagreed and five participants disagreed at the time that seventeen participants expressed the opinion that they did not know (M= 3.75, SD= 0.93). This suggests that some participants still need some time to think of what to write about even after the IWB pre-writing instruction.

In conclusion, the findings of the data analysis of the performance questionnaire with respect to the development of ideas (Figure 9) showed that the participants noticed a positive change in their written performance when they practiced pre-writing activities via the IWB, and as a result, these findings have

conformed with the findings of the data analyses of the essay scores with respect to the development of ideas after the IWB pre-writing instruction. Therefore, the first Alternative Hypothesis that the use of the Interactive Whiteboard in pre-writing instruction improves the development of ideas in the writings of EFL secondary students was retained.

Table 11

Descriptive Statistics of Students' Perception of Performance regarding Idea Development after IWB Prewriting Instruction

		SD	D	N	A	SA	*M*	*SD*
Q1	f			4	42	19	4.23	0.55
	%			6.2	64.6	29.2		
Q3	f			5	37	23	4.28	0.60
	%			7.7	56.9	35.4		
Q4	f			9	41	15	4.09	0.60
	%			13.8	63.1	23.1		
Q5	f		1	3	39	22	4.26	0.61
	%		1.5	4.6	60	33.8		
Q8	f		1	13	43	8	3.89	0.61
	%		1.5	20	66.2	12.3		
Q9	f	21	30	8	2	4	2.05	1.06
	%	32.3	46.2	12.3	3.1	6.2		
Q10	f	1	5	17	28	14	3.75	0.93
	%	1.5	7.7	26.2	43.1	21.5		

Note: f: Frequency %: Percentage SD: Strongly disagree D: Disagree N: I don't know A: Agree SA: Strongly agree *M*: Mean *SD*: Standard Deviation

Q1: The pre-writing activities in the Interactive Whiteboard increase my knowledge about the writing topic

Q3: I can develop my ideas better during writing because of the diagrams, charts, and webs displayed via the Interactive Whiteboard

Q4: I become more able to support the main ideas in my writings after the pre-writing activities used in the Interactive Whiteboard

Q5: The pre-writing activities in the Interactive Whiteboard help me in remembering the main ideas of the topic during writing

Q8: Practicing the pre-writing activities via the Interactive Whiteboard makes me get rid of the mental block that I used to suffer from when I start writing

Q9: The pre-writing activities in the Interactive Whiteboard distract me from developing my ideas during writing

Q10: I no more need much time to write down my ideas after the Interactive Whiteboard pre-writing activities

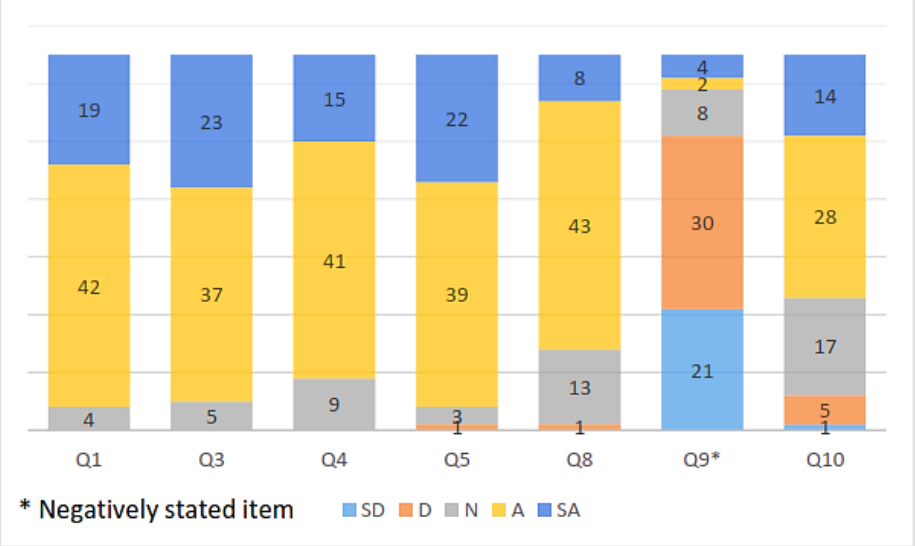

Figure 9. Students‘ perception of their performance regarding idea development after IWB prewriting instruction

B. Quantitative Findings of Research Question 2

Research Question 2: Does the use of Interactive Whiteboard in pre-writing instruction lead EFL students to use topic-related vocabulary words properly? To answer Research Question 2, quantitative data were collected from two sources: Pretest1 Posttest1 scores pertaining to the proper use of topic-related words of participants in experimental and control groups and a questionnaire on the performance of participants in the experimental group with respect to the proper use of topic-related words after using IWB pre-writing instruction.

1. Data Analysis of the Pretest1 Posttest1 pertaining to the Proper Use of Topic-related Words after the IWB Pre-Writing Instruction

In order to examine if implementing the IWB pre-writing instruction enhanced participants‘ performance in terms of the proper use of topic-related words, the researcher used two independent samples t-tests. The first independent samples t-test compared between the mean value of the pretest1 scores pertaining to the proper use of topic-related words of the participants in the treatment group and that of participants in the non-treatment group. Table 12 shows the results of the Shapiro-Wilk test of normality which investigated whether the levels of the independent variable were statistically normal. The results of the Shapiro-Wilk test with a priori alpha level of .05 revealed that neither the Control Group Level nor the Experimental Group Level was significant given that $p > .05$ for the Control Group and $p > .05$ for the Experimental Group, and as such, the researcher considered both levels of the Independent Variable to be normally distributed. Thus, she rejected the Alternative Hypothesis ($p < 0.05$) that there was

a significant departure from normality, and as such, she concluded that both levels (the experimental and control) of the independent variable are statistically normally distributed.

Table 12

Test of Normality of Pretest1 (Vocab)

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Pretest1 (vocab)	C	.97	69	.06
	E	.97	65	.07

To validate the results of the Shapiro-Wilk Tests, the researcher tested the assumption of normality graphically by examining the histograms and the outputs of the Q-Q Plots of Pretest1 scores (vocab). The histogram of Pretest1 scores of the control group (Figure 10) and that of the experimental group (Figure 11) showed that the data of Pretest1 scores (vocab) of both groups are normally distributed.

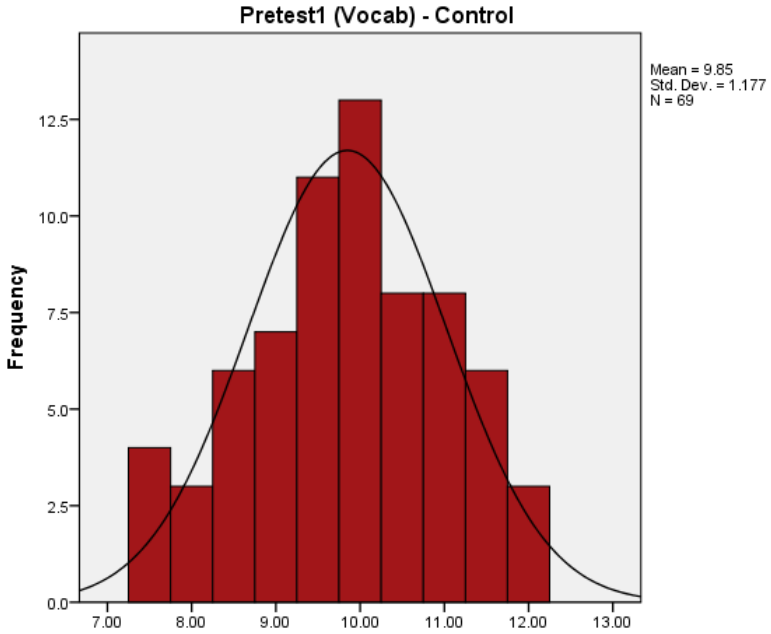

Figure 10. Histogram of Pretest1 scores (vocab) of the control group

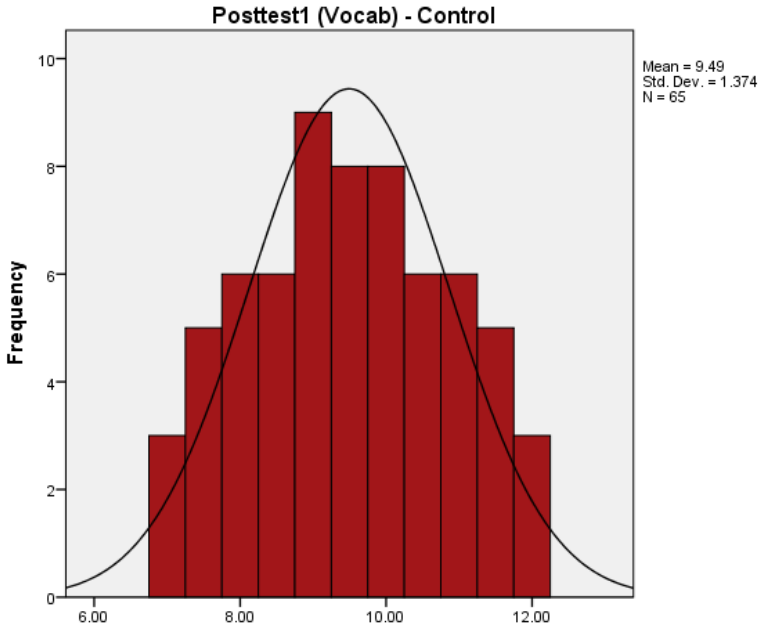

Figure 11. Histogram of Pretest1 scores (vocab) of the experimental group

By examining the normal Q-Q plots of Pretest1 scores (vocab) of the control group and that of the experimental group shown in Figures 12 and 13 below, the researcher found that the assumption of normality has been met in both groups since the data were located along the diagonal lines in both figures 12 and 13. A further illustration of normal distribution of Pretest1 scores (vocab) of both groups was displayed in the boxplots (Appendix H3).

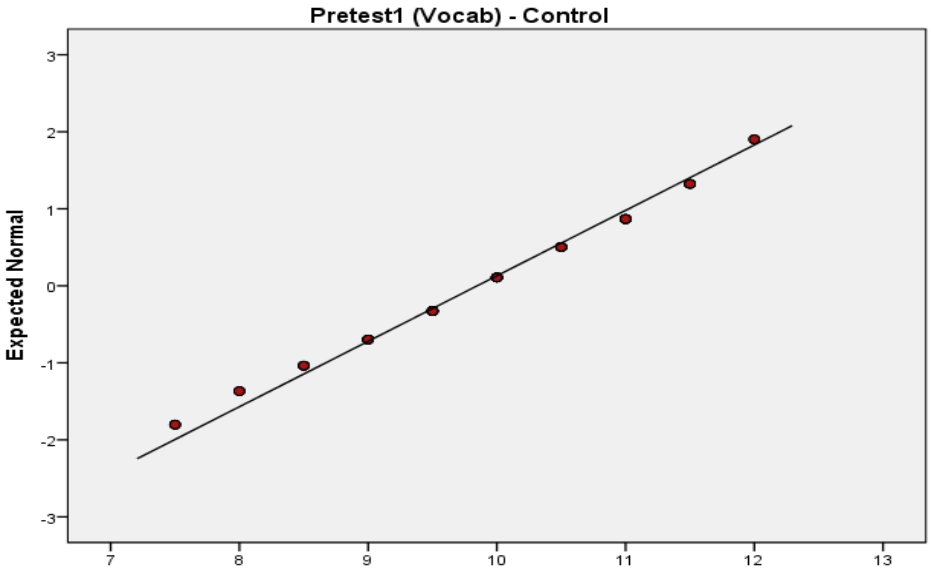

Figure 12. Normal Q-Q Plot of Pretest1 scores (vocab) of the control group

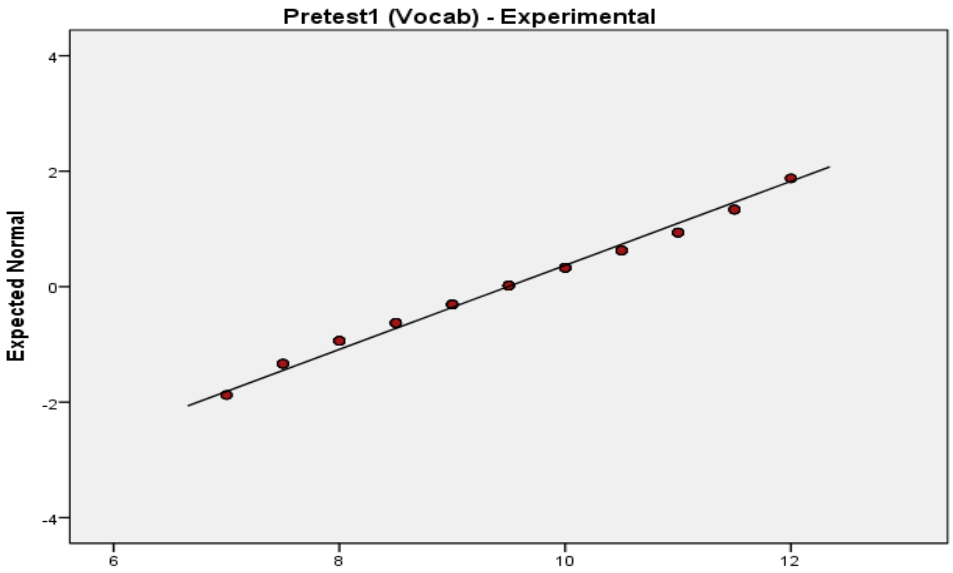

Figure 13. Normal Q-Q plot of Pretest1 scores (vocab) of the experimental group

With respect to the assumption of homogeneity of variance for Pretest1 scores (vocabulary), the Levene‘s Test was used with the level of significance α = .05. As table 14 shows, P (F= 1.83; p>0.05) = .15. As such, the Alternative Hypothesis (H_1: $\sigma_1^2 \neq \sigma_2^2$) was rejected for the assumption of homogeneity of variance and found out that there was no significant difference between the two group‘s variances. Therefore, it was concluded that the assumption of homogeneity of variance was met, and accordingly, it was proceeded with the independent samples t-test.

Descriptive statistics showed no substantial difference in the mean values between the control group (M = 9.85, SD = 1.18) and the experimental group (M = 9.49, SD = 1.37) as shown in Table 13. The results of the independent-samples t-test of Pretest1 scores (vocab) with an alpha level of .05, and as revealed in Table 14, indicated that there was not a significant difference between the mean value of the experimental group and that of the control group with P (t (132) =

1.61, df = 132) > .05. Thus, the Alternative Hypothesis H_1: $\mu_{Control} \neq \mu_{Experimental}$ was rejected in favor of the Null Hypothesis $H_0 \mu_{Control} = \mu_{Experimental}$.

Table 13

Descriptive Statistics of Pretest1 Scores (Vocab)

	Group	N	*M*	*SD*	Std. Error Mean
Pretest1 scores (vocab)	C	69	9.85	1.18	.14
	E	65	9.49	1.37	.17

Table 14

Independent Sample Test of Pretest1 Scores (Vocab)

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	T	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
							Lower	Upper
Pretest1 Scores (vocab)	Equal variances assumed	2.09	.15	1.61	132	.11	-.08	.79
	Equal variances not assumed			1.60	126.27	.11	-.08	.79

Another independent-samples t-test was conducted using an alpha level of .05 in order to determine whether the experimental group (receiving IWB pre-writing instruction) and the control group (receiving regular instruction) differed significantly on Posttest1 with respect to the proper use of topic-related words in essay writings.

Concerning the statistical normal distribution of Posttest1 scores (vocab) of control and experimental levels, the results of the Shapiro-Wilk test with an a priori alpha level of .05 displayed in table 15 showed that p > .05 for the control

group and p > .05 for the experimental group which means that neither the control group level nor the experimental group level was significant, and as such, the researcher considered both levels of the independent variable to be normally distributed. Therefore, the Alternative Hypothesis ($p < 0.05$) was rejected as there was a significant departure from normality, and hence, it was concluded that the assumption of normality has been met.

Table 15

Test of Normality of Posttest1 Scores (Vocab)

	Group	Shapiro-Wilk		
		Statistic	Df	Sig.
Posttest1 scores (vocab)	C	.97	69	.15
	E	.96	65	.06

With respect to the graphical normality of data, an examination of the histogram of Posttest1 scores (vocab) of the control group (Figure 14) and that of the experimental group (Figure 15) evidenced that the data of both groups were normally distributed.

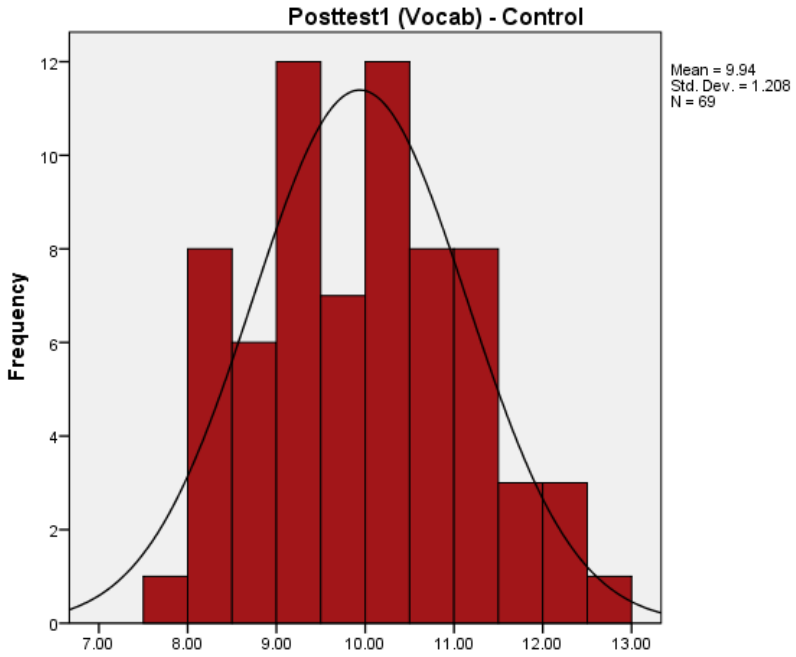

Figure 14. Histogram of Posttest1 scores (vocab) of the control group

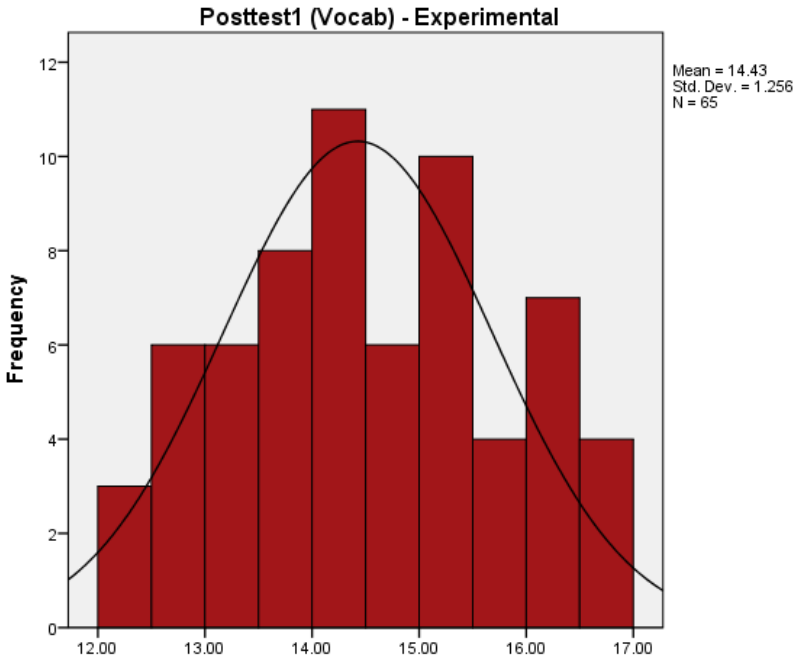

Figure 15. Histogram of Posttest1 scores (vocab) of the experimental group

As to the normal Q-Q plots of the Posttest1 scores (vocab), Figures 16 and 17 ascertained normality of data in both groups. Boxplots of Posttest1 scores (vocab) of both groups (Appendix H3) provided further cross validation of normality of data.

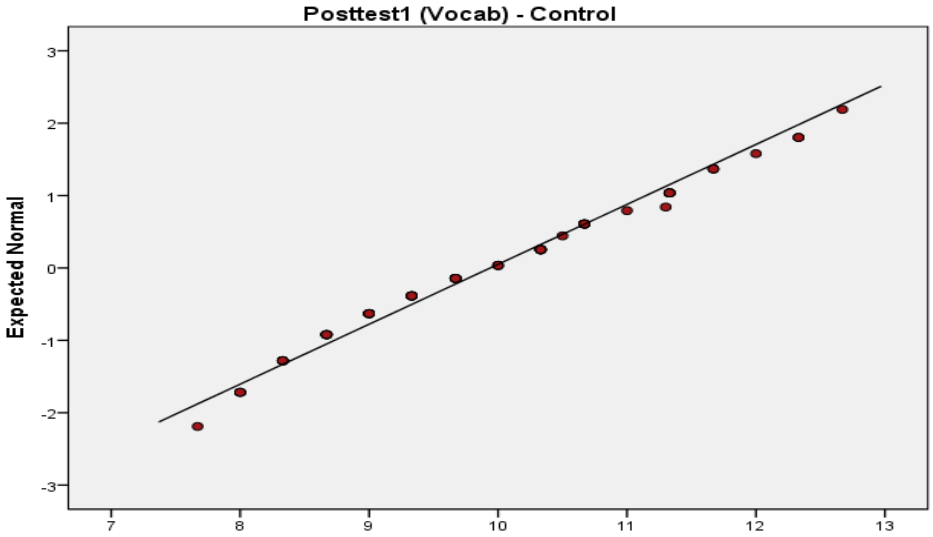

Figure 16. Normal Q-Q plot of Posttest1 scores (vocab) of the control group

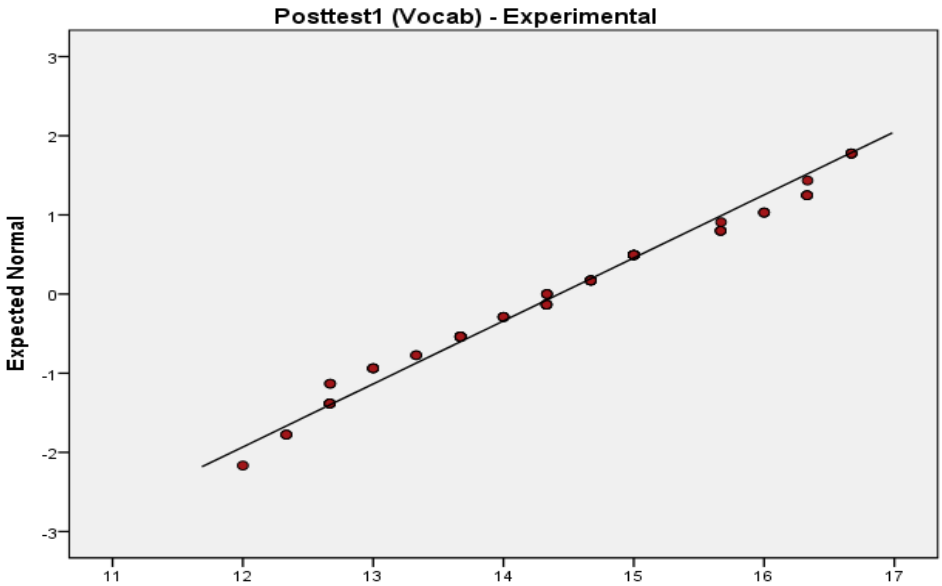

Figure 17. Normal Q-Q plot of Posttest1 scores (vocab) of the experimental group

To examine the assumption of homogeneity of variance for Posttest1 scores (vocab) variable, the Levene‘s Test was used with the level of significance α = .05. As Table 17 indicates, the results revealed that P (F=.017; p>.05) = 0.88. Consequently, the Alternative Hypothesis (H_1: $\sigma_1^2 \neq \sigma_2^2$) was rejected for the assumption of homogeneity of variance and concluded that there was no significant difference between the two group‘s variances. Hence, the assumption of homogeneity of variance was met, so it was proceeded with the t-tests. As Tables 16 and 17 reveal, the results of the independent samples t-test of Posttest1 scores relating to the proper use of topic-related words in essay writings showed that after the intervention, the experimental group (M = 14.43, SD = 1.26) outperformed the control group in writing achievement (M = 9.94, SD = 1.21), P(t (132) = -21.08, df = 132) < .05. The effect size of improvement d = -3.64 suggests a remarkable gain in achievement from an educational point of view. Thus, the Null Hypothesis H_0:$\mu_{Control}=\mu_{Experimental}$was rejected in favor of the Alternative one H_1:$\mu_{Control}\neq\mu_{Experimental}$.

Table 16

Descriptive Statistics of Posttest1 Scores (Vocab)

	Group	N	*M*	*SD*	Std. Error Mean
Posttest1 scores (vocab)	C	69	9.94	1.21	.14
	E	65	14.43	1.26	.15

Table 17

Independent Sample Test of Posttest1 Scores (Vocab)

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
							Lower	Upper
Posttest1 Scores (vocab)	Equal variances assumed	.02	.88	-21.08	132	.00	-4.91	-4.07
	Equal variances not assumed			-21.05	130.71	.00	-4.91	-4.06

The researcher, also, conducted two paired samples t-tests with the level of significance $\alpha \leq .05$. The first was to find out if regular pre-writing instruction enabled students in the non-treatment group to use topic-related words properly in essay writings, and the second was to test whether the IWB pre-writing instruction allowed students in the treatment group to use topic-related words properly in essay writings. As indicated in Table 18 and 19, there was not a significant difference ($p > 0.05$) between Pretest1 scores (vocab) of students in the non-treatment group before receiving pre-writing instruction ($M = 9.84$, $SD = 1.18$) and posttest1 scores (vocab) of students in the non-treatment group after receiving regular pre-writing instruction ($M=9.94$, $SD = 1.21$).

Table 18

Descriptive Statistics of Pretest1 Posttest1 Scores (Vocab) of the Experimental Group

		N	*M*	*SD*
Pair	pretest1.vocab.C - posttest1.vocab.C	69	9.84	1.18
		69	9.94	1.21

Table 19

Paired Samples Test of Pretest1 Posttest1 Scores (Vocab) of the Control Group

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Lower	Upper			
Pair	pretest1ideas.C - posttest1.ideas.C	-.20906	.02674	-1.543	68	.127

In contrast to the above results, descriptive statistics displayed in Tables 20 and 21 show that there was a remarkable difference in mean values ($p < 0.05$) between Pretest1 scores (vocab) of students in the treatment group before receiving pre-writing instruction (M = 9.49, SD = 1.37) and Posttest1 scores (vocab) of participants in the treatment group after receiving IWB pre-writing instruction (M = 14.43, SD = 1.26). The results of the paired samples t-test conducted to measure difference in the participants‘ writing performance pertaining to the proper use of topic-related vocabulary words after the IWB treatment revealed statistically significant difference P(t (64) = -30.03, df = 64) = .00 at $\alpha \leq .05$. The 95% confidence interval for the difference is between -5.26 and -4.60. Therefore, the researcher deduced that IWB pre-writing instruction helped students in the experimental group to perform better in essay writing with respect to the proper use of topic-related vocabulary words.

Table 20

Descriptive Statistics of Pretest1 Posttest1 Scores (Vocab) of the Experimental Group

		N	*M*	*SD*
Pair	pretest1.vocab.exp - posttest1.vocab.exp	65	9.49	1.37
		65	14.43	1.26

Table 21

Paired Samples Test of Pretest1 Posttest1 Scores (Vocab) of the Experimental Group

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Lower	Upper			
Pair 1	pretest1.vocab.exp - posttest1.vocab.exp	-5.26	-4.60	-30.03	64	.00

2. Data Analysis of the Performance Result with respect to Topic-related Vocabulary Words after the IWB Pre-writing Instruction

Descriptive statistics (frequency, percentage, mean, and standard deviation) of three questionnaire items on the participants‘ perception of their performance in terms of their proper use of vocabulary words in essay writings were calculated and presented in Table 22. The findings of the three questionnaire items verified the above mentioned analyses of the participants‘ essay scores of the proper use of topic-related words in the experimental group after receiving the IWB pre-writing instruction (See Figure 18). Almost all the participants disagreed that vocabulary activities in the Interactive Whiteboard were not related to the writing topic (M=1.6, SD= 0.55). When asked about whether the IWB pre-writing instruction enriched their bank of vocabulary with many words related to the writing topic (Q6), 21.5% of the participants strongly agreed, 64.6 % of them agreed, and only

6.2% disagreed (M= 4.02, SD=0.73). Also, 56.9% of the participants agreed that they use vocabulary words more efficiently in their writings after the IWB pre-writing instruction, 27.7% of them strongly agreed, 10.8% couldn‘t decide, 3.1% disagreed and only 1.5% strongly disagreed (M=4.06, SD=0.80).

Table 22

Descriptive Statistics of Students' Perception of Performance regarding their Proper Use of Topic-Related Vocabulary Words after IWB Prewriting Instruction

		SD	D	N	A	SA	*M*	*SD*
Q2	F	28	35	2			1.60	0.55
	%	43.1	53.8	3.1				
Q6	F		4	5	42	14	4.02	0.73
	%		6.2	7.7	64.6	21.5		
Q7	F	1	2	7	37	18	4.06	0.80
	%	1.5	3.1	10.8	56.9	27.7		

Note: F: Frequency SD: Strongly disagree D: Disagree N: I don‘t know A: Agree SA: Strongly agree M: Mean SD: Standard Deviation

Q2: The vocabulary activities in the Interactive Whiteboard were not related to the writing topic

Q6: My bank of vocabulary is enriched with many words related to the writing topic due to pre-writing activities in the Interactive Whiteboard

Q7: I use vocabulary words more efficiently in my writing after the Interactive Whiteboard pre-writing activities

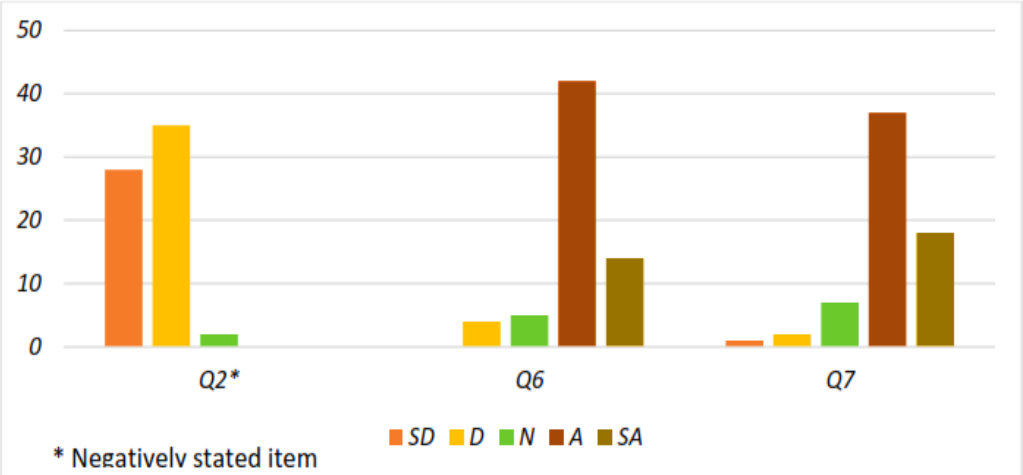

Figure 18. Students‘ perception of their performance regarding proper use of topic-related vocabulary words after IWB prewriting instruction

All in all, the findings of the data analysis of the performance questionnaire with respect to the proper use of vocabulary revealed that the participants reported that the IWB treatment enabled them to effectually use the acquired vocabulary in their writings; hence, these findings have been in harmony with the findings of the data analyses of the essay scores in terms of the proper use of topic-related vocabulary words after the IWB treatment. Thus, the second Alternative Hypothesis that the use of Interactive Whiteboard in pre-writing instruction leads EFL secondary students to use topic-related vocabulary words properly was retained.

C. Quantitative Findings of Research Questions 3

Quantitative data needed to answer the aforementioned research question were collected from a pre-post survey on the participants‘ attitudes towards writing in the control and experimental groups regarding IWB treatment.

1. **Data Analysis of EFL Student Attitude towards Writing Questionnaire regarding Regular Treatment**

Participants' Attitudes towards EFL Writing before and after conducting regular treatment were examined by the use of questionnaires with a five Likert scale for the responses. Responses of students in the control group were analyzed using the mean values, standard deviation, and a paired samples t-test. Overall mean scores of the total subject sample for each pair in the questionnaire with standard deviation are shown in Table 23; the findings of the paired samples t-test are displayed in table 24.

The results of pair 1 indicated a significant difference in attitude at P≤ .05, t (68) =6.02, P= .00. However, when we examine the mean values before regular prewriting instruction (M = 2.70, SD = .73) and after it (M = 2.00, SD= .62), we notice that students still disagree that writing in English is an enjoyable activity. Hence, we concluded that students showed a negative attitude (See Figure 19).

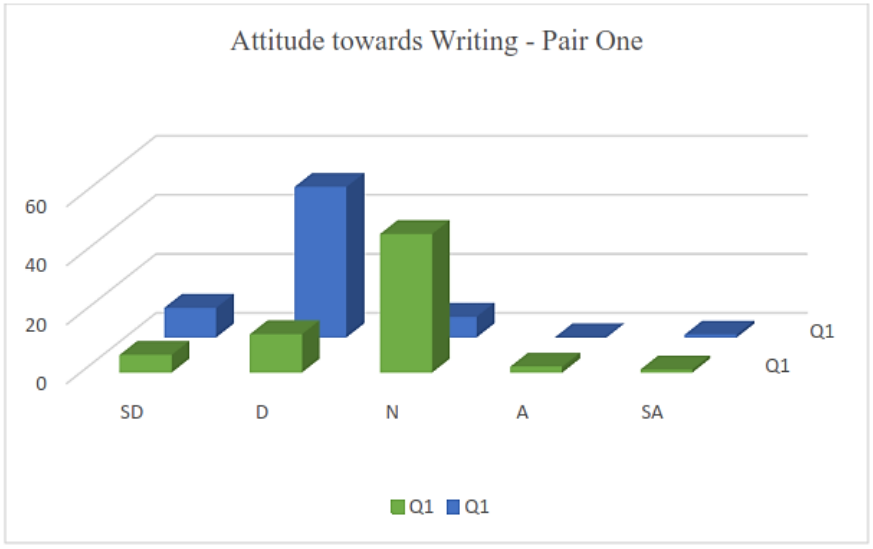

*Figure*19. Students‘ Pre-Post attitude towards writing pair one (regular instruction)

The results of pair 2 showed the mean values before regular prewriting instruction(M = 3.97, SD = .54) and after it (M = 4.14, SD= .39) with a significant difference in attitude at P≤ .05, t (68) = -1.99, P= .051. Nevertheless, such a difference was towards negativity in students‘ attitude towards writing, for more students agreed or strongly agreed that they try to avoid writing in English after regular treatment as revealed in Figure 20.

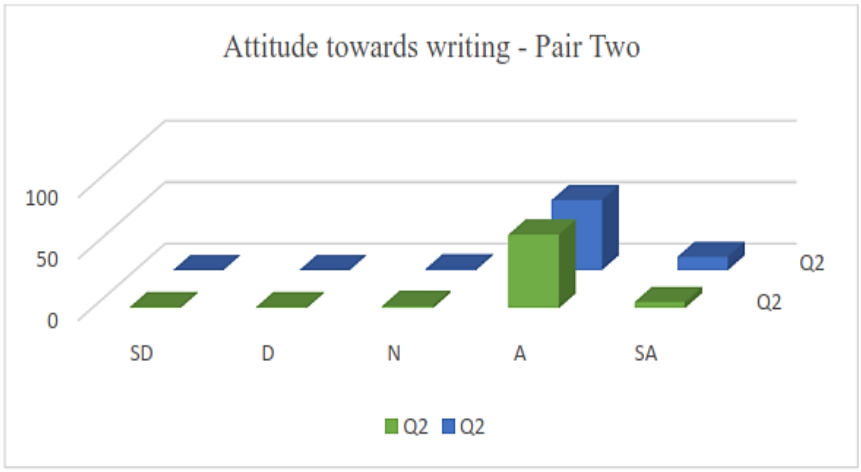

Figure 20. Students‘ Pre-Post attitude towards writing pair two (regular instruction)

The results of pair 3 didn‘t show a change between the mean values before regular prewriting instruction (M = 2.62, SD = .69) and after it (M = 2.61, SD= .57). Also, the findings didn‘t show a significant difference in attitude at P≤ .05, t (68) = .13, P= .90. Thus, students still don‘t like to write in English to communicate their ideas (See Figure 21).

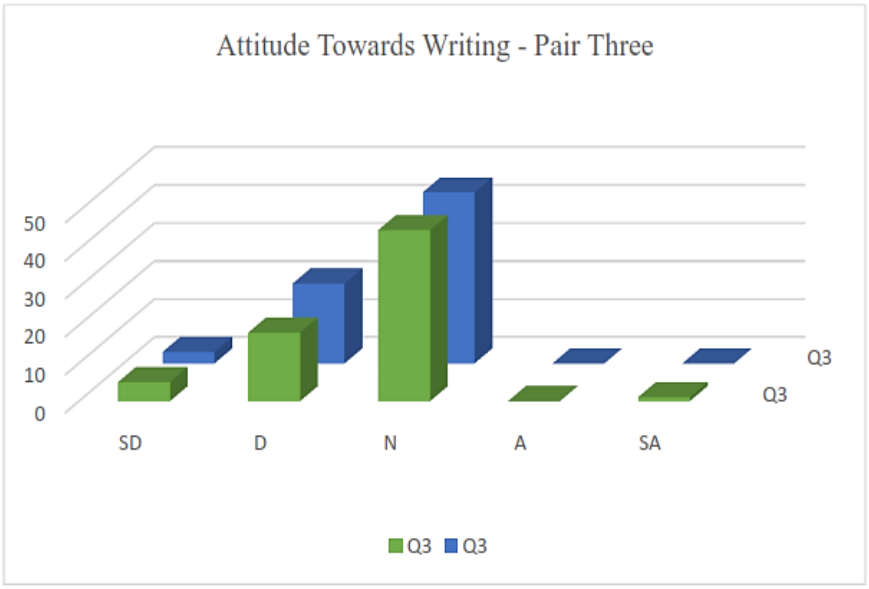

Figure 21. Students‘ Pre-Post attitude towards writing pair three (regular instruction)

The results of pair 4 indicated a significant difference in attitude at P≤ .05, t (68) =6.02, P= .00 with mean values (M = 4.55, SD = .63) before regular prewriting instruction and (M = 4.28, SD = .62) after it. However, as Figure 22 indicates, the difference is the result of an increase in the number of students who agreed or strongly agreed that they feel tense when they can‘t find the proper vocabulary words to express their ideas even after regular instruction.

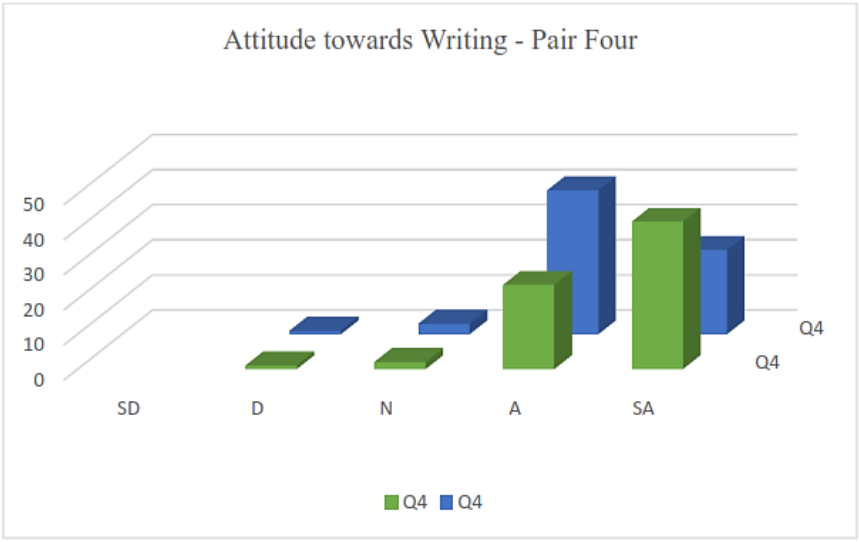

Figure 22. Students‘ Pre-Post attitude towards writing pair four (regular instruction)

The results of pair 5 didn‘t reveal a change between the mean values before regular prewriting instruction (M = 4.30, SD = .58) and after it (M = 4.25, SD= .47), and they didn‘t show any significant difference in attitude at P≤ .05, t (68) =.66, P= .51. This means that students remain to suffer in finding topic-related vocabulary words as shown in Figure 23.

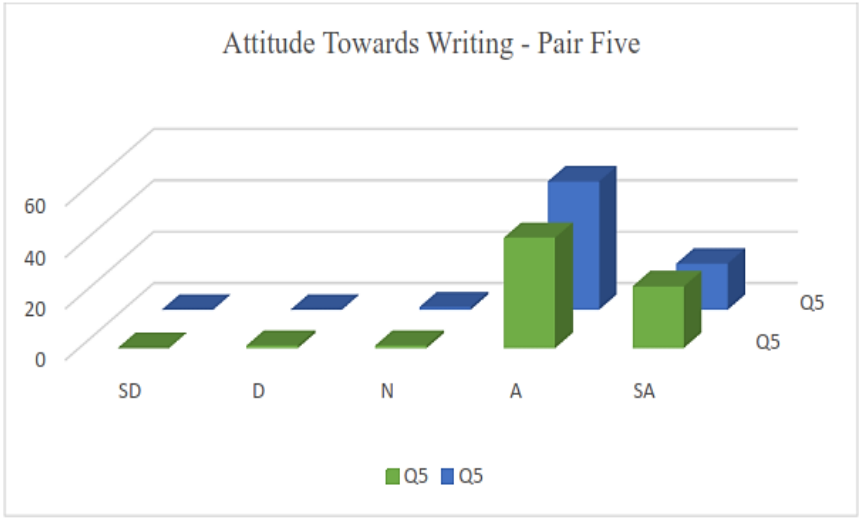

Figure 23. Students‘ Pre-Post attitude towards writing pair five (regular instruction)

The results of pair 6 indicated a significant difference in attitude at P≤ .05, t (68) = 1.98, P= .05 with mean values before regular prewriting instruction M = 4.23, SD = .75 and after it M = 4.04, SD= .36. Nevertheless, an examination of Figure 24 reveals that the attitude of the students did not shift to positivity. In fact, instead of strongly agreeing that it is difficult for them to support their ideas well when writing in English, the students only agreed on that.

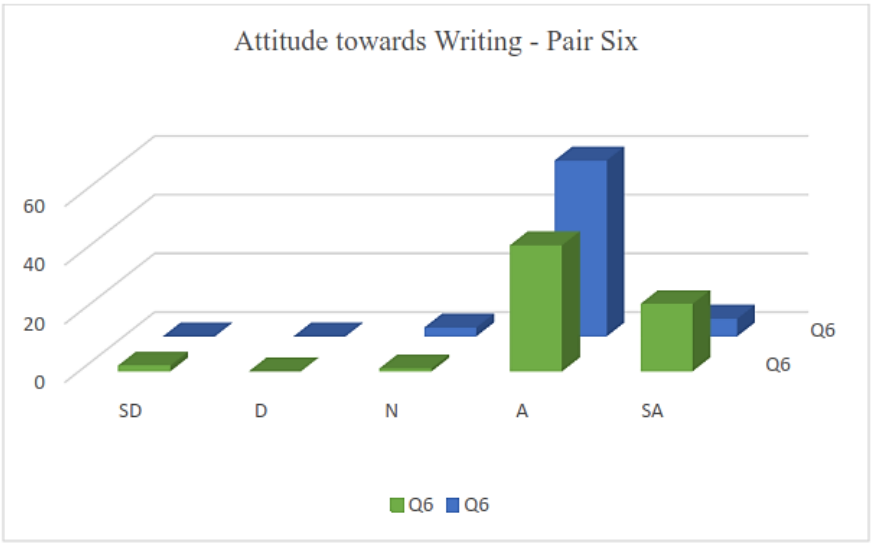

Figure 24. Students‘ Pre-Post attitude towards writing pair six (regular instruction)

The results of pair 7 didn‘t show a change between the mean values before regular prewriting instruction (M = 2.51, SD = .82) and after it (M = 2.68, SD= .47), and it didn‘t indicate a significant difference in attitude at P≤ .05, t (68) = -1.68, P= .11. Hence, students continue to disagree that they like to write their diaries in English as shown in Figure 25.

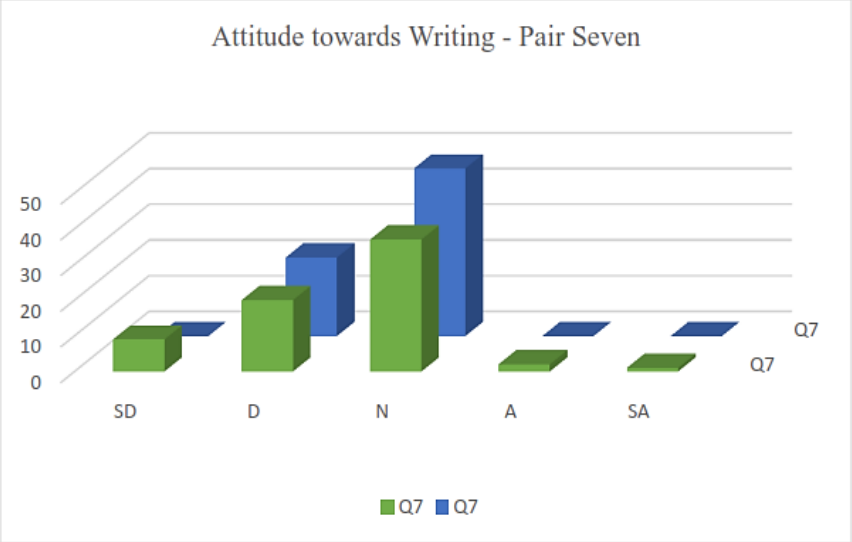

Figure 25. Students‘ Pre-Post attitude towards writing pair seven (regular instruction)

The results of pair 8 didn‘t show a substantial change between the mean values before regular prewriting instruction (M = 4.26, SD = .53) and after it (M = 4.14, SD= .46), and they didn‘t indicate a significant difference in attitude at P≤ .05, t (68) = 1.30, P= .20 as well. As a result, students continue to take much time to think of what they have to write about (See Figure 26).

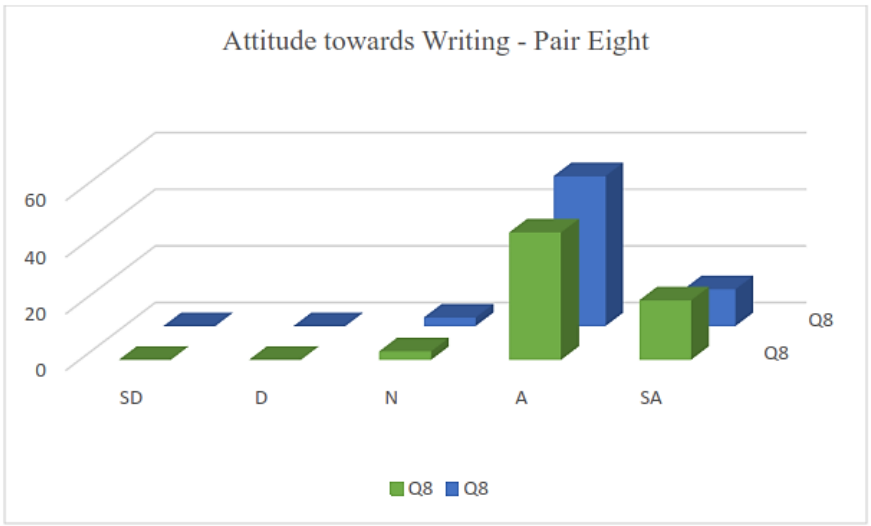

Figure 26. Students‘ Pre-Post attitude towards writing pair eight (regular instruction)

The results of pair 9 didn‘t indicate a considerable change between the mean values before regular prewriting instruction (M = 3.90, SD = .66) and after it (M = 4.04, SD= .40), and they, also, didn‘t show a significant difference in attitude at P≤ .05, t (68) = -1.60, P= .11. This means that students still consider writing in English a burden to them (See Figure 27).

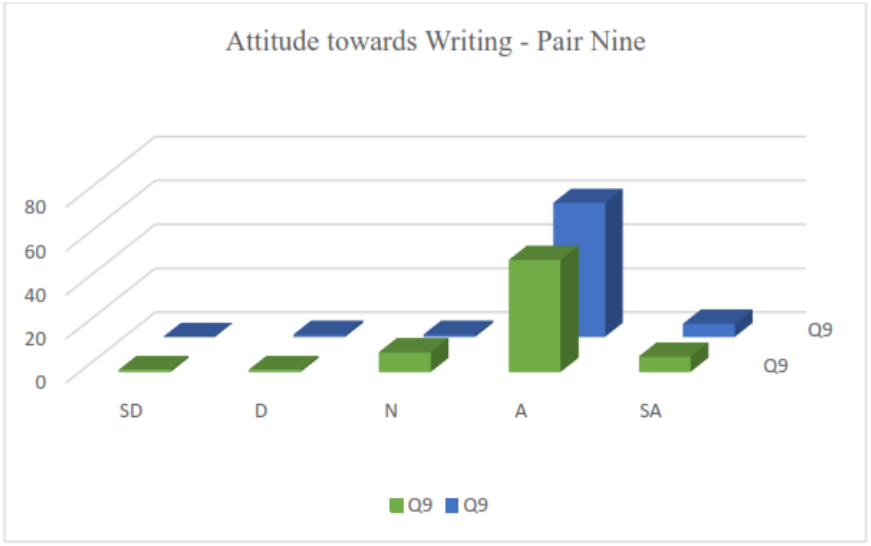

*Figure*27. Students‘ pre-post attitude towards writing pair nine (regular instruction)

The results of pair 10 indicated a significant difference in attitude at P≤ .05, t (68) = 3.21, P= .002, and a change in the mean values before regular prewriting instruction (M = 2.84, SD = 1.17) and after it (M = 3.42, SD= .83). However, as figure 28 shows, the change in attitude occurred in a more negative sense, for the number of students who agreed or strongly agreed that they feel bored during the English writing period increased.

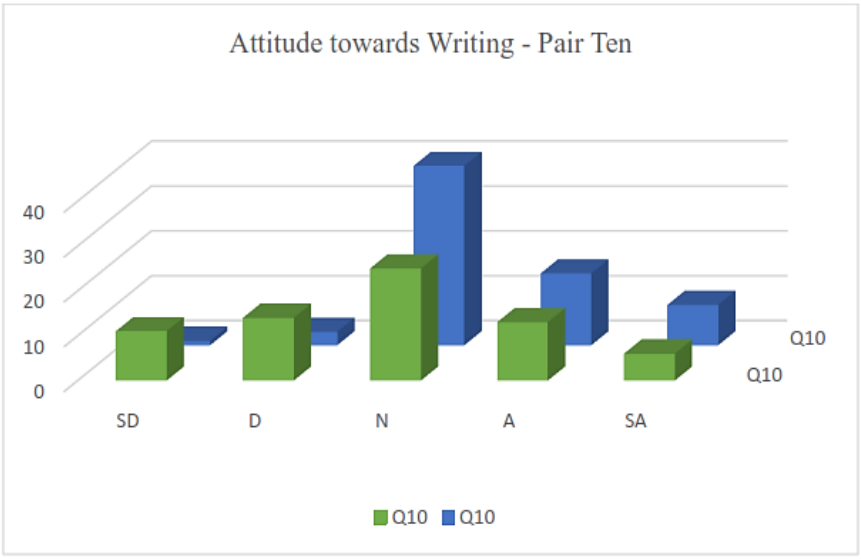

Figure 28. Students‘ Pre-Post attitude towards writing pair ten (regular instruction)

The results of pair 11 displayed neither a substantial change between the mean values before regular prewriting instruction (M = 4.07, SD = .46) and after it (M = 3.99, SD= .50)nor a significant difference in attitude at P≤ .05, t (68) = 1.10, P= .28 as Figure 29 indicates. Thus, students continue to get lost when they start writing in English.

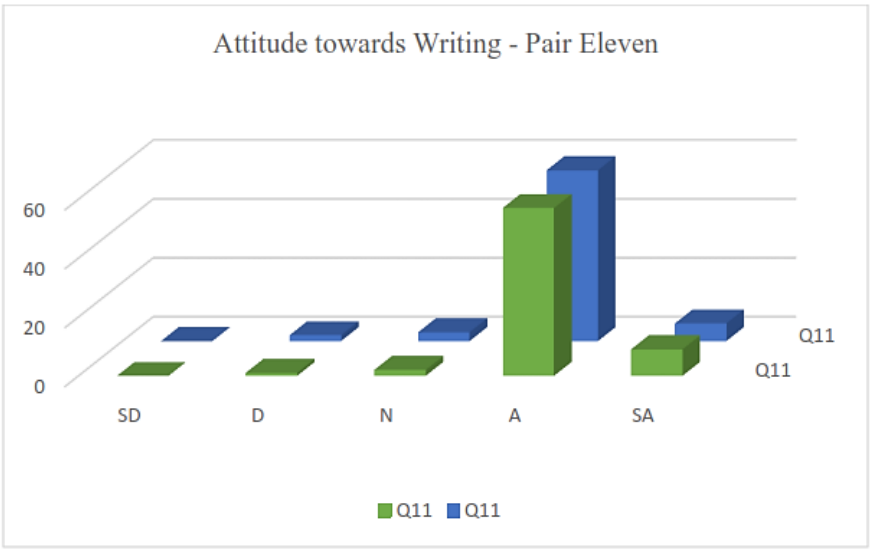

Figure 29. Students‘ Pre-Post attitude towards writing pair eleven (regular instruction)

The results of pair 12 indicated a weighty change between the mean values before regular prewriting instruction (M = 3.61, SD = 1.19) and after it (M = 4.14, SD= .39) and a significant difference in attitude at P≤ .05, t (68) = -3.58, P= .001. As displayed in Figure 30, more students agreed that they like other language skills more than writing after regular instruction.

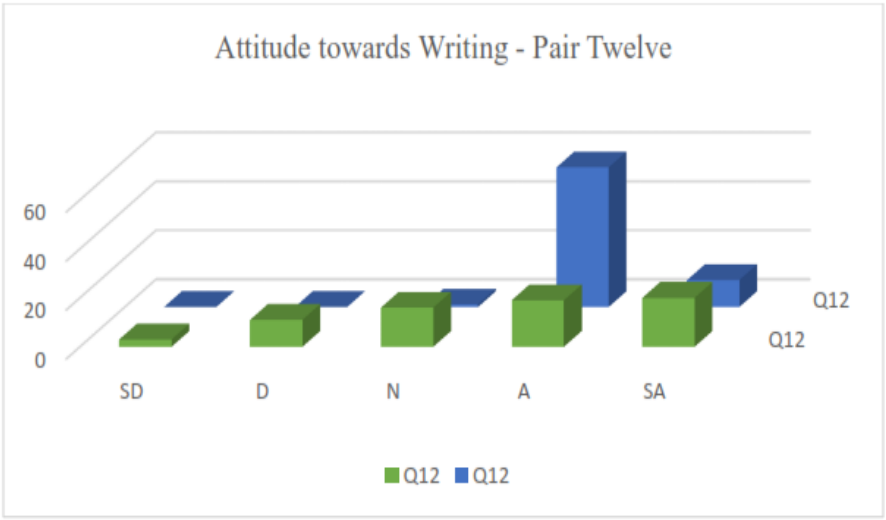

Figure 30. Students‘ Pre-Post attitude towards writing pair twelve (regular instruction)

The results of pair 13 showed no change in the mean values before regular prewriting instruction (M = 2.01, SD = .68) and after it (M = 1.99, SD= .50), and it didn‘t reveal any significant difference in attitude at P≤ .05, t (68) = .29, P= .78. Accordingly, students continue to disagree that they feel confident when thy write in English (See Figure 31).

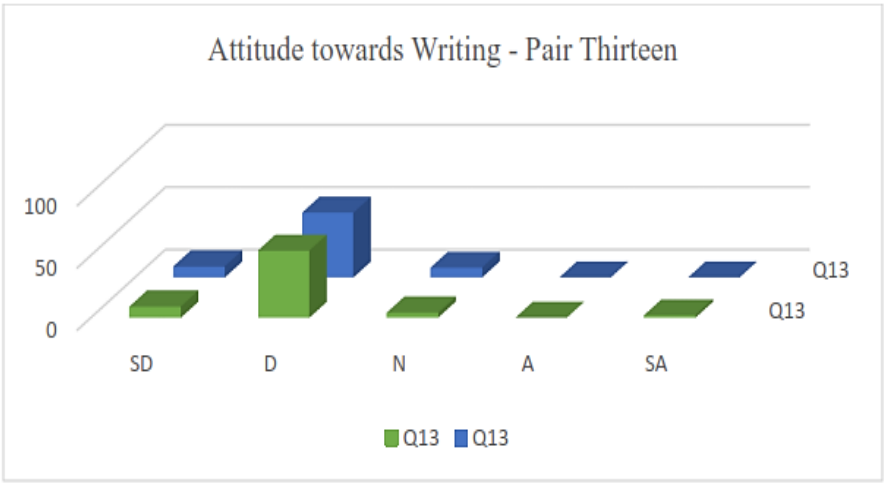

*Figure 31.*Students‘ Pre-Post attitude towards writing pair thirteen (regular instruction)

The results of pair 14 exposed neither a change in the mean values before regular prewriting instruction (M = 3.87, SD = .64) and after it (M = 4.01, SD= .56) nor a significant difference in attitude at P≤ .05, t (68)= -1.40, P= .17. This indicates that students continue to believe that they can‘t develop their ideas well in English as displayed in Figure 32.

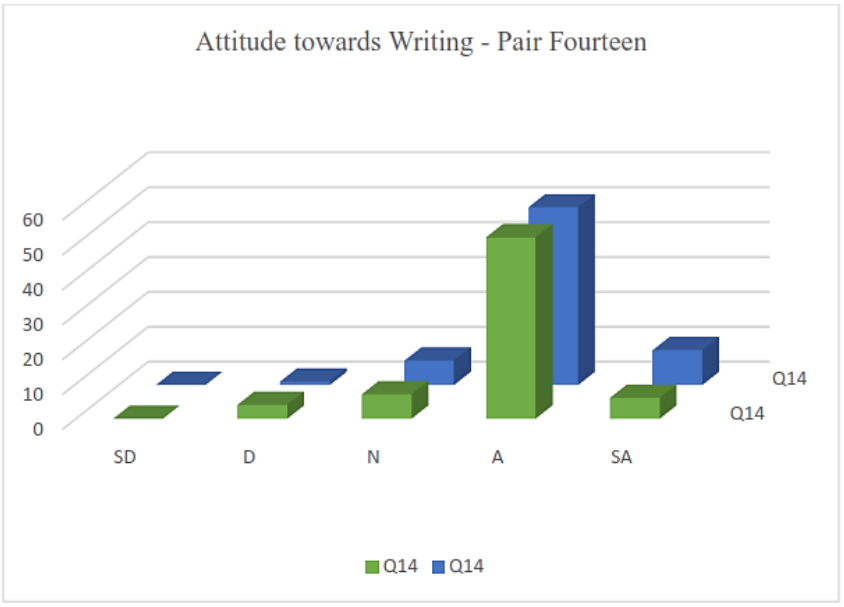

*Figure*32. Students‘ Pre-Post attitude towards writing pair fourteen (regular instruction)

The results of pair 15 indicated a noteworthy change between the mean values before regular prewriting instruction (M = 2.71, SD = .77) and after it (M = 2.26, SD= .74) and revealed a significant difference in attitude at P≤ .05, t (68) =3.65, P= .00. Nonetheless, Figure 33 shows a shift towards more negativity in students‘ attitude after regular treatment, for more students didn‘t approve that writing their thoughts in English is a relieving activity.

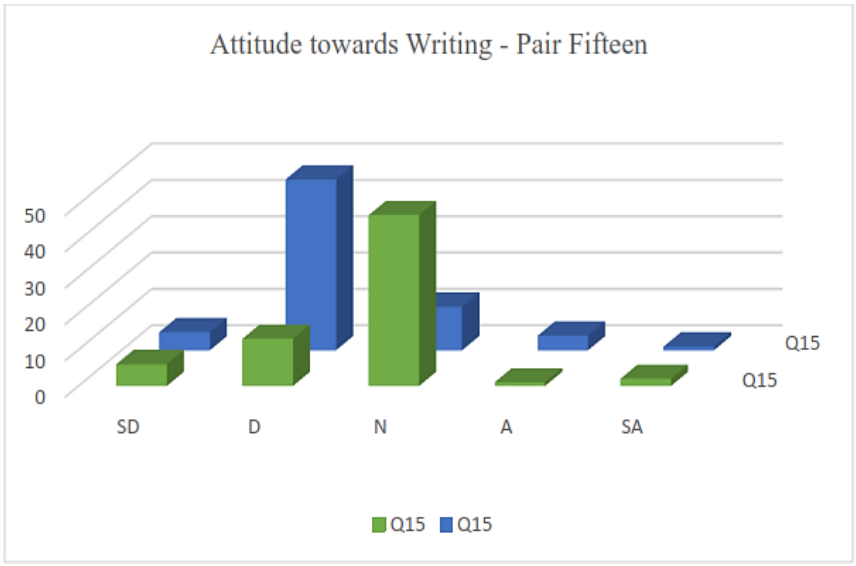

Figure 33. Students‘ Pre-Post attitude towards writing pair fifteen (regular instruction)

In a nutshell, regular prewriting instruction did not change the participants‘ attitude towards writing in the control group. This means that participants in the control group still adopt unfavorable attitudes towards writing.

Table 23

Descriptive Statistics of Students Attitude towards Writing regarding Regular Treatment

		N	*M*	*SD*
Pair 1	Writing in English is an enjoyable class activity	69	2.70	.73
	Writing in English is a pleasant class activity	69	2.00	.62
Pair 2	I try to avoid the writing tasks in the English class	69	3.97	.54
	I try to avoid writing in English	69	4.14	.39
Pair 3	I like to write in English to communicate my ideas	69	2.62	.69
	I choose to write in English to communicate my ideas	69	2.61	.57
Pair 4	I feel nervous when I can't find the proper vocabulary words to express my ideas	69	4.55	.63
	I feel tense when I can't find the proper vocabulary words to express my ideas	69	4.28	.62
Pair 5	When I write, I panic to remember the topic-related vocabulary words discussed in the pre-writing activities.	69	4.30	.58
	When I write, I feel stressed to find or remember the topic- related vocabulary words discussed in the pre- writing activities	69	4.25	.47
Pair 6	I feel tense during writing when I can't support my main ideas	69	4.23	.75
	It's difficult for me to support my ideas well when writing in English	69	4.04	.36
Pair 7	I like to use English when writing my diary	69	2.51	.82
	I prefer to write my diary in English	69	2.68	.47
Pair 8	I waste much time to think of what I have to write about	69	4.26	.53
	I take time to start writing in English	69	4.14	.46
Pair 9	Writing in English is a burden to me	69	3.90	.66
	Writing in English is a load on me	69	4.04	.40

Pair 10	I consider the writing period as the most boring among English periods	69	2.84	1.17
	I feel bored during the English writing period	69	3.42	.83
Pair 11	I get lost when I start writing in English	69	4.07	.46
	I become lost when I start writing in English	69	3.99	.50
Pair 12	I would like to learn all language skills except writing	69	3.61	1.19
	I like other language skills more than writing	69	4.14	.39
Pair 13	I feel confident when I write in English	69	2.01	.68
	Writing in English gives me a sense of confidence	69	1.99	.50
Pair 14	I never seem able to develop my ideas well	69	3.87	.64
	I can't develop my ideas well in English	69	4.01	.56
Pair 15	I like seeing my thoughts on paper	69	2.71	.77
	Writing my thoughts in English is a relieving activity	69	2.26	.74

Table 24

Paired Samples Test of Students Attitude towards Writing regarding Regular Treatment

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Lower	Upper			
Pair 1	Writing in English is an enjoyable class activity - Writing in English is a pleasant class activity	.47	.93	6.02	68	.00
Pair 2	I try to avoid the writing tasks in the English class - I try to avoid writing in English	-.35	.00	-1.99	68	.05
Pair 3	I like to write in English to communicate my ideas - I choose to write in English to communicate my ideas	-.21	.24	.13	68	.90
Pair 4	I feel nervous when I can't find the proper vocabulary words to express my ideas - I feel tense when I can't find the proper vocabulary words to express my ideas	.08	.47	2.79	68	.01
Pair 5	When I write, I panic to remember the topic-related vocabulary words discussed in the pre-writing activities. - When I write, I feel stressed to find or remember the topic- related vocabulary words discussed in the pre- writing activities	-.12	.23	.66	68	.51
Pair 6	I feel tense during writing when I can't support my main ideas - It's difficult for me to support my ideas well when writing in English	-.00	.38	1.98	68	.05
Pair 7	I like to use English when writing my diary - I prefer to write my diary in English	-.39	.04	-1.62	68	.11
Pair 8	I waste much time to think of what I have to write about - I take time to start writing in English	-.06	.29	1.30	68	.20

Pair 9	Writing in English is a burden to me - Writing in English is a load on me	-.33	.04	-1.60	68	.11
Pair 10	I consider the writing period as the most boring among English periods - I feel bored during the English writing period	-.94	-.22	-3.21	68	.002
Pair 11	I get lost when I start writing in English - I become lost when I start writing in English	-.07	.25	1.10	68	.28
Pair 12	I would like to learn all language skills except writing - I like other language skills more than writing	-.84	-.24	-3.58	68	.001
Pair 13	I feel confident when I write in English - Writing in English gives me a sense of confidence	-.17	.23	.29	68	.78
Pair 14	I never seem able to develop my ideas well - I can't develop my ideas well in English	-.35	.062	-1.40	68	.17
Pair 15	I like seeing my thoughts on paper - Writing my thoughts in English is a relieving activity	.20	.70	3.65	68	.001

2. Data Analysis of EFL Student Attitude towards Writing Questionnaire regarding IWB Treatment

Participants' Attitudes towards EFL Writing before and after conducting IWB treatment were examined by the use of questionnaires with a five Likert scale for the responses. Responses of students in the experimental group were analyzed using the mean values, standard deviation, and a paired samples t-test. Overall mean scores of the total subject sample for each pair in the questionnaire with standard deviation are shown in Table 25, and the findings of the paired samples t-test are displayed in Table 26.

The results of pair 1 indicated a considerable change in the mean values before IWB prewriting instruction (M = 2.52, SD = 1.05) and after it (M = 3.92, SD= .78) as well as a significant difference in attitude at P≤ .05, t (64) =-9.88, P= .00. The 95% confidence interval of the difference ranges from -1.68 to -1.12. Hence, we concluded that students changed their attitude and started to view writing as an enjoyable and engaging activity after the IWB treatment (See Figure 34).

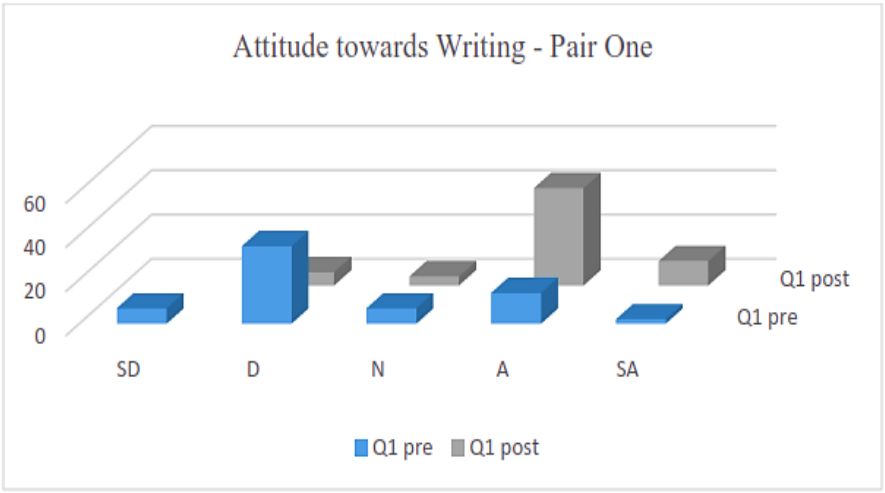

Figure 34. Students‘ Pre-Post attitude towards writing pair one (IWB instruction)

The results of pair 2 showed that students who used to avoid the writing tasks in the English class no more did that after the IWB intervention (Refer to Figure 35). This is obviously revealed in the mean values before the IWB prewriting instruction (M = 3.35, SD = 1.15) and after it (M = 1.92, SD= .51) and the significant difference in attitude at P≤ .05, t (64) = 9.42, P= .00. The 95% confidence interval for the difference is between 1.13 and 1.73

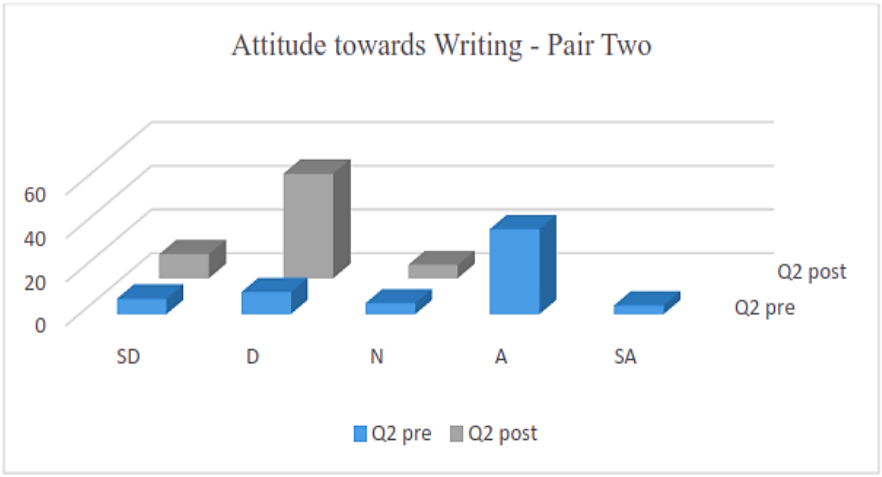

Figure 35. Students‘ Pre-Post attitude towards writing pair two (IWB instruction)

The results of pair 3 showed a substantial change between the mean values before IWB prewriting instruction (M = 2.63, SD = 1.04) and after it (M = 3.83, SD= .72). Also, the findings revealed a significant difference in attitude at P≤ .05, t (64) = -7.97, P= .00 with 95% confidence interval for the difference between -1.50 and -.90. Thus, The IWB instruction motivated students to write in English to communicate their ideas (See Figure 36).

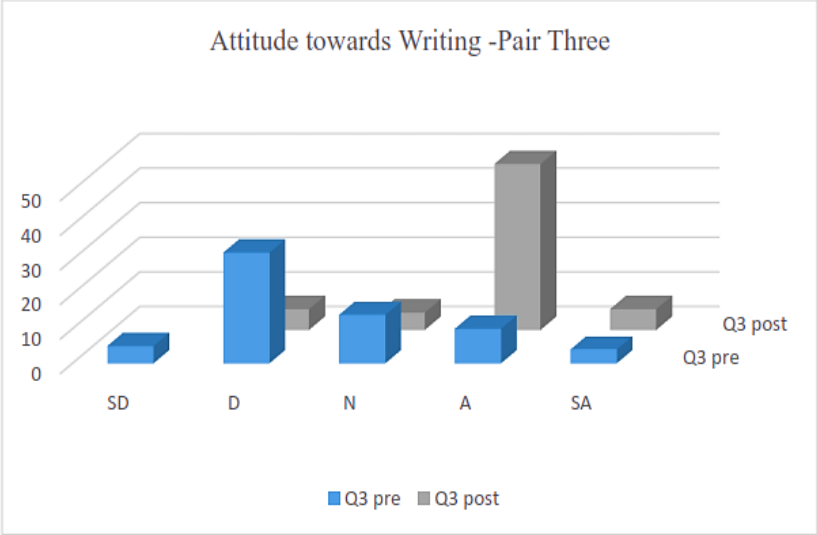

Figure 36. Students‘ Pre-Post attitude towards writing pair three (IWB instruction)

The results of pair 4 indicated a significant difference in attitude at P≤ .05, t (64) =3.52, P= .001. As Figure 37 indicates, students strongly agreed that they felt nervous when they couldn‘t find proper vocabulary words to express their ideas before IWB prewriting instruction (M = 4.58, SD = .71), whereas they agreed that they became less anxious when they write after the IWB treatment (M = 4.11, SD = .79). The 95% confidence interval for the difference is between .21 and .75.

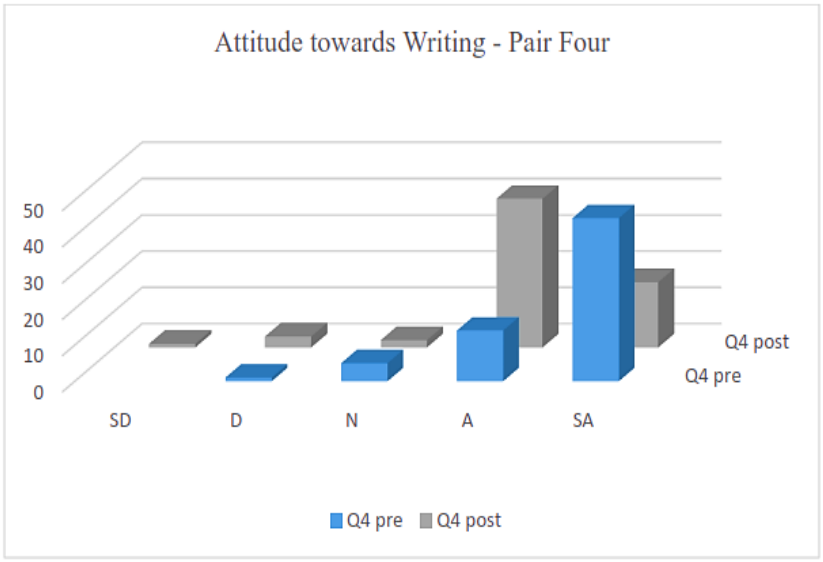

Figure 37. Students‘ Pre-Post attitude towards writing pair four (IWB instruction)

The results of pair 5 revealed a change between the mean values before IWB prewriting instruction (M = 4.09, SD = .86) and after it (M = 1.92, SD= .57) as well as a significant difference in attitude at P≤ .05, t (64) = 18.51, P= .00. The 95% confidence interval for the difference is between 1.94 and 2.40. This means

that students no more panic to remember the topic-related vocabulary words after the IWB treatment as shown in Figure 38.

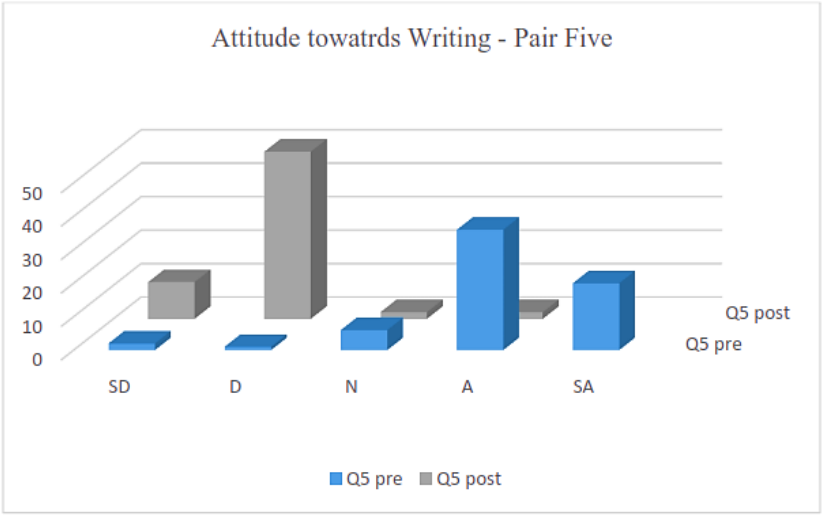

Figure 39. Students‘ Pre-Post attitude towards writing pair five (IWB instruction)

The results of pair 6 indicated a significant difference in attitude at P≤ .05, t (64) = 17.07, P= .00 with mean values before IWB prewriting instruction M = 4.20, SD = .96 and after it M = 1.95, SD= .60. The 95% confidence interval for the difference is between 1.99 and 2.51. This reveals that it‘s no more difficulty for students to support their ideas well in writing after the IWB prewriting instruction (Refer to Figure 40).

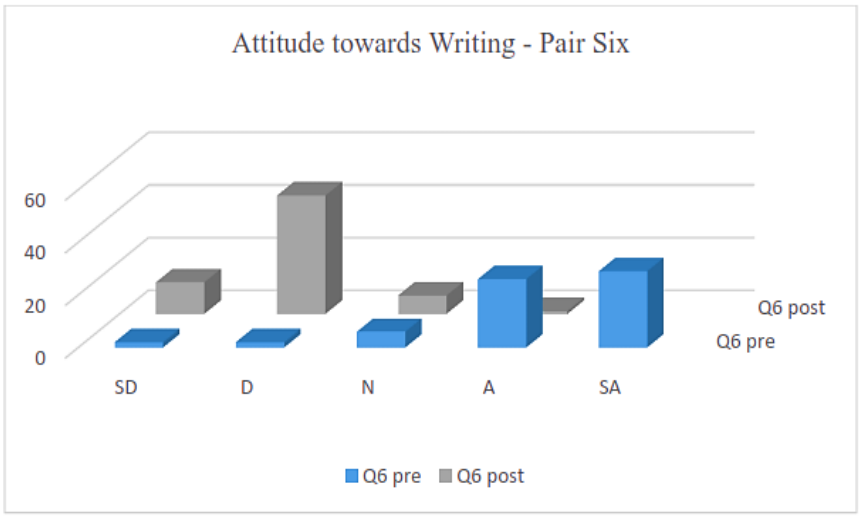

Figure 40. Students‘ Pre-Post attitude towards writing pair six (IWB instruction)

The results of pair 7 indicated a change between the mean values before IWB prewriting instruction (M = 3.05, SD = 1.44) and after it (M = 4.23, SD= .63). It, also, showed a significant difference in attitude at P≤ .05, t (64) = -5.73, P= .00. The 95% confidence interval for the difference is between -1.60 and -.77. Hence, students who used to have negative attitude towards writing in English before the IWB treatment expressed positive attitudes towards writing after it as shown in Figure 41.

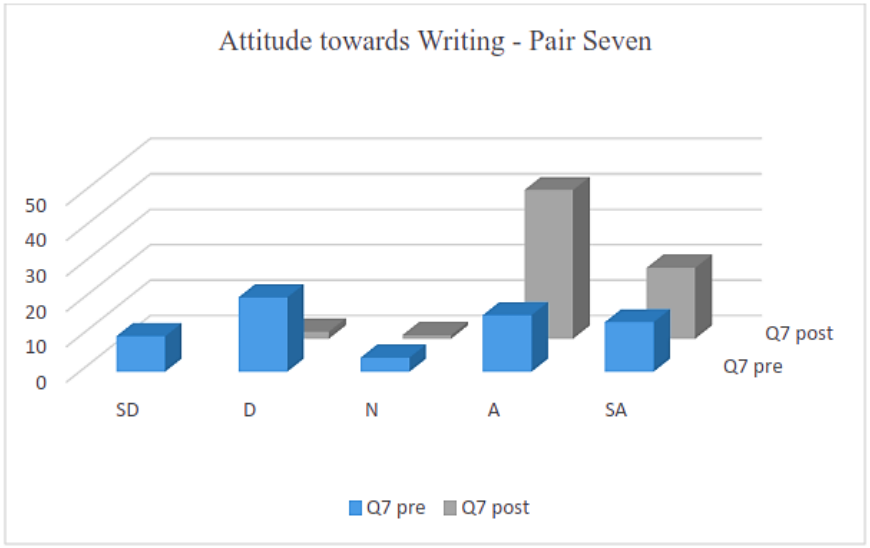

Figure 41. Students‘ Pre-Post attitude towards writing pair seven (IWB instruction)

The results of pair 8 showed a substantial change between the mean values before IWB prewriting instruction (M = 4.03, SD = .88) and after it (M = 2.00, SD= .61) and a significant difference in attitude at P≤ .05, t (64) = 16.38, P= .00 as well. The 95% confidence interval for the difference is between 1.78 and 2.28. As a result, students didn‘t take much time to think of what they have to write after the IWB treatment as they used to do before it (See Figure 42).

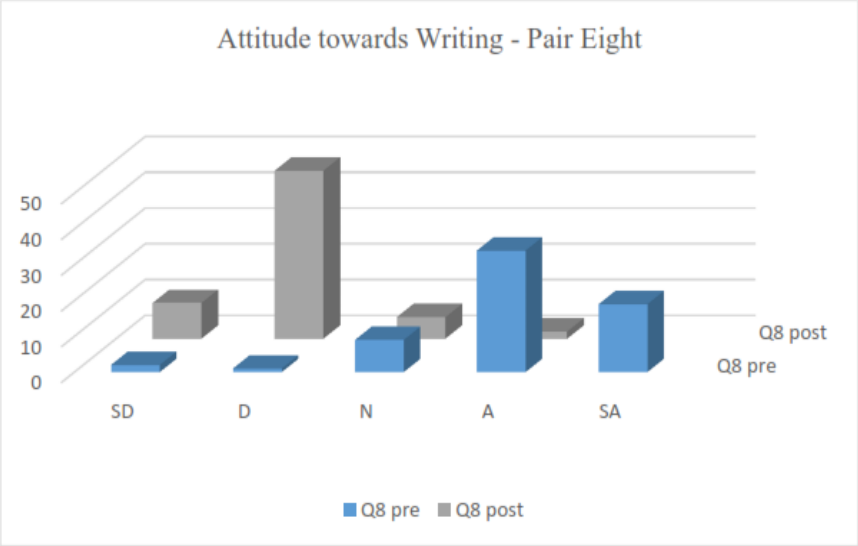

Figure 42. Students‘ Pre-Post attitude towards writing pair eight (IWB instruction)

The results of pair 9 indicated a considerable change between the mean values before IWB prewriting instruction (M = 3.29, SD = 1.23) and after it (M = 3.95, SD= .62) as well as a significant difference in attitude at P≤ .05, t (64) = -3.71, P= .00. The 95% confidence interval for the difference is between -1.02 and -.31. This means that students no more viewed writing in English a burden to them after the IWB treatment as they used to do before it (See Figure 43).

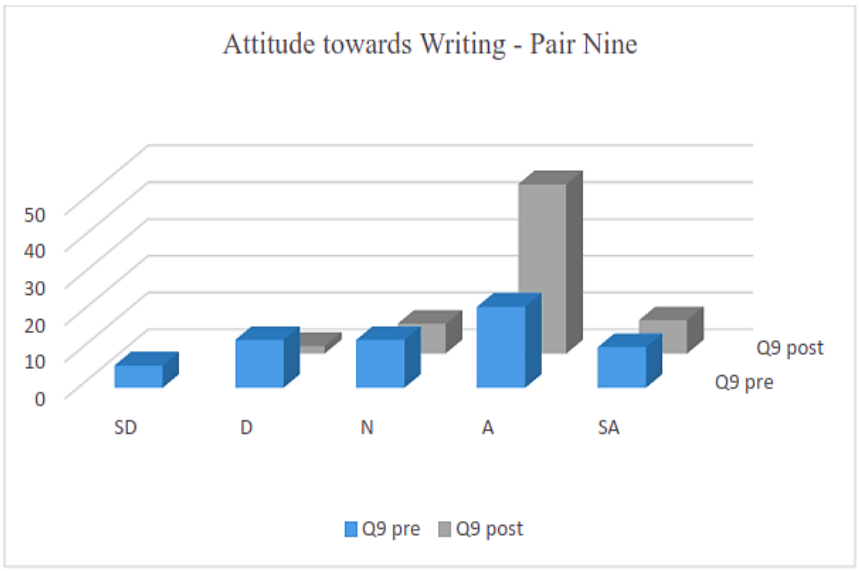

Figure 43. Students‘ Pre-Post attitude towards writing pair nine (IWB instruction)

The results of pair 10 indicated a significant difference in attitude at P≤ .05, t (64) = 5.43, P= .00, and a change in the mean values before IWB prewriting instruction (M = 2.88, SD = 1.17) and after it (M = 2.06, SD= .66). The 95% confidence interval for the difference is between .56 and 1.12. As Figure 44 shows, some students agreed that the writing period is a boring one and others disagreed on that before the IWB treatment. However, the students‘ attitude changed after the IWB treatment, for the majority of students either disagreed or strongly disagreed that they feel bored during the English writing period.

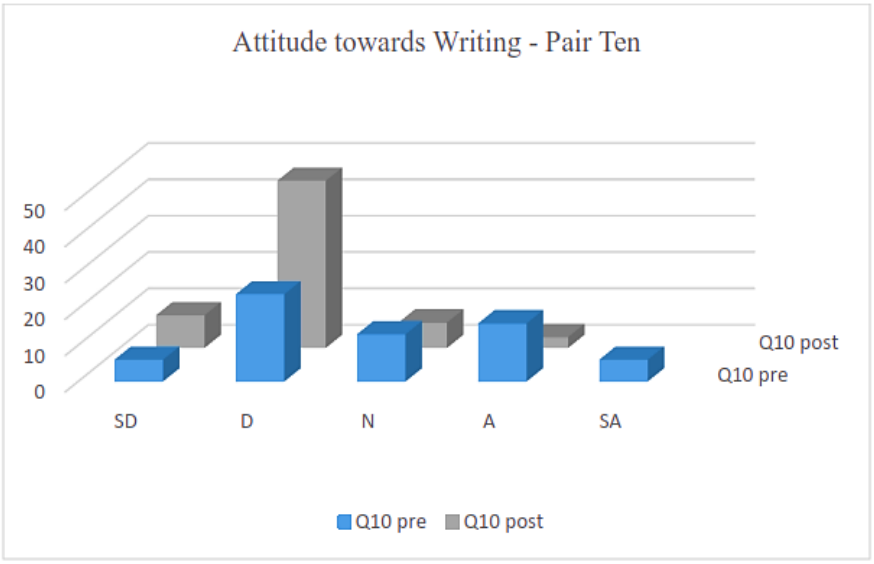

Figure 44. Students‘ Pre-Post attitude towards writing pair ten (IWB instruction)

The results of pair 11 displayed a substantial change between the mean values before the IWB prewriting instruction (M = 3.52, SD = .99) and after it (M = 2.00, SD= .69). They, also, showed a significant difference in attitude at P≤ .05, t (64) = 11.25, P= .00. The 95% confidence interval for the difference is between 1.25 and 1.79. Thus, students no more get lost when they start writing in English after the IWB treatment as they used to do before it (See Figure 45).

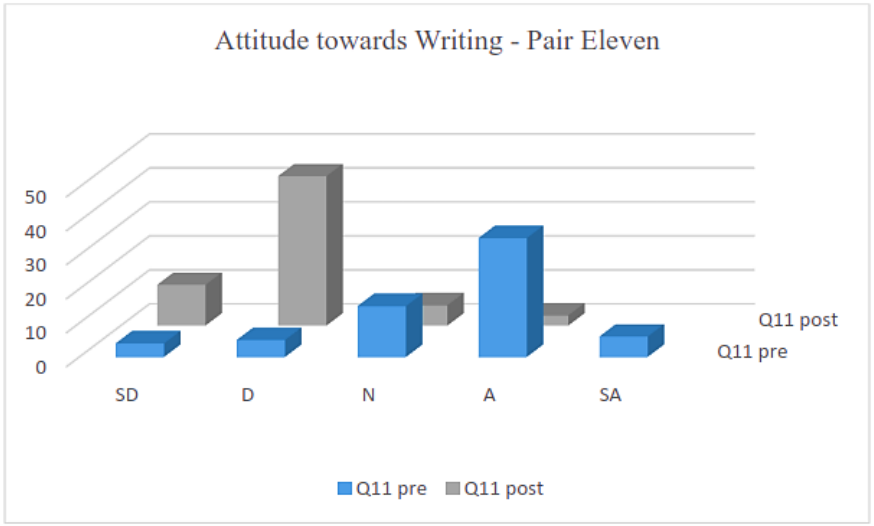

Figure 45. Students‘ Pre-Post attitude towards writing pair eleven (IWB instruction)

The results of pair 12 indicated a weighty change between the mean values before the IWB prewriting instruction (M = 3.46, SD = 1.11) and after it (M = 2.05, SD= .65) and a significant difference in attitude at P≤ .05, t (64) = 8.34, P= .00. The 95% confidence interval for the difference is between 1.08 and 1.75. As displayed in Figure 46, some students agreed that they like other language skills more than writing, and others disagreed before the IWB treatment. Nevertheless, such an attitude drastically changed after the IWB prewriting instruction since most students either disagreed or strongly disagreed that they like other language skills more than writing.

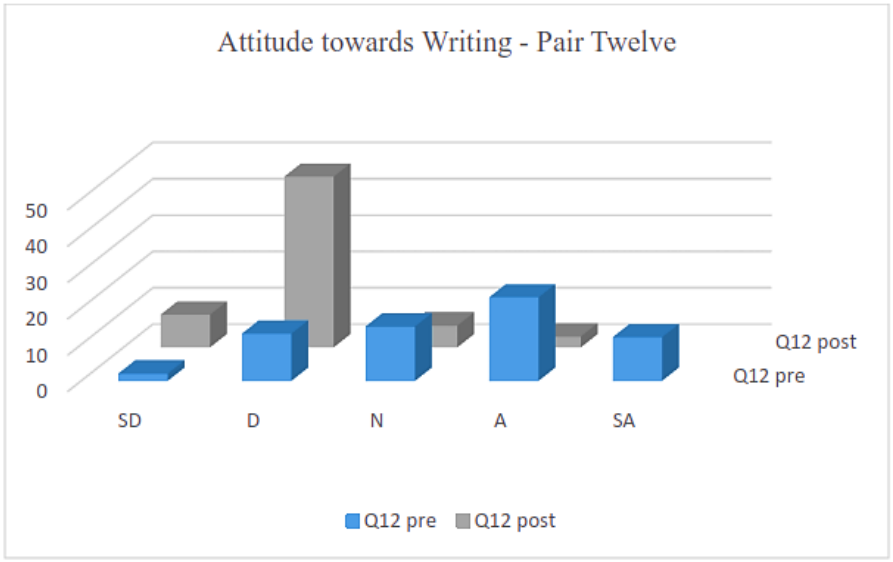

Figure 46. Students‘ Pre-Post attitude towards writing pair twelve (IWB instruction)

The results of pair 13 showed a substantial change between the mean values before the IWB prewriting instruction (M = 2.48, SD = .92) and after it (M = 4.23, SD= .63), and they revealed a significant difference in attitude at P≤ .05, t (64) = -11.92, P= .00 as well. The 95% confidence interval for the difference is between -2.05 and -1.46. Accordingly, the IWB treatment induced students to feel confident when they write in English (See Figure 47).

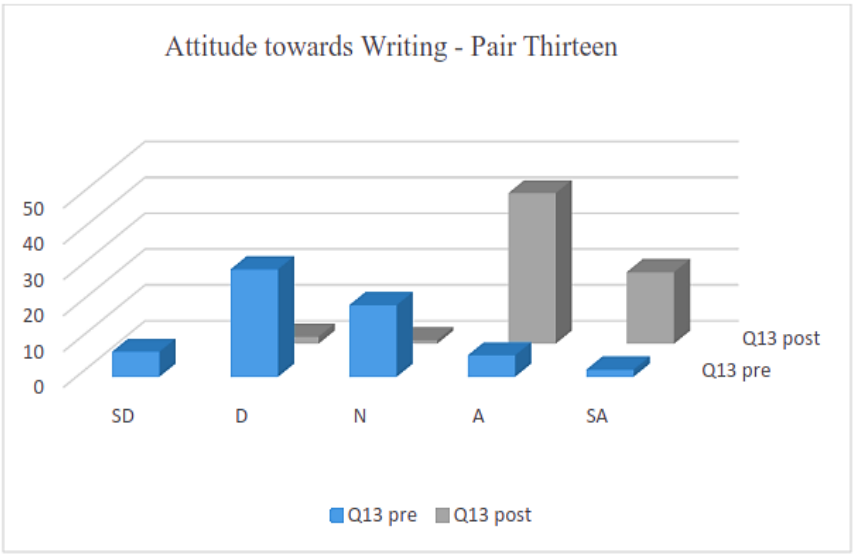

Figure 47. Students‘ Pre-Post attitude towards writing pair thirteen (IWB instruction)

The results of pair 14 exposed a change in the mean values before IWB prewriting instruction (M = 3.58, SD = .97) and after it (M = 4.22, SD= .57) and a significant difference in attitude at P≤ .05, t (64)= -4.63, P= .00. The 95% confidence interval for the difference is between -.90 and -.36. This indicates that students no more believed that they can‘t develop their ideas well in English after the IWB treatment as they used to think before it (See Figure 48).

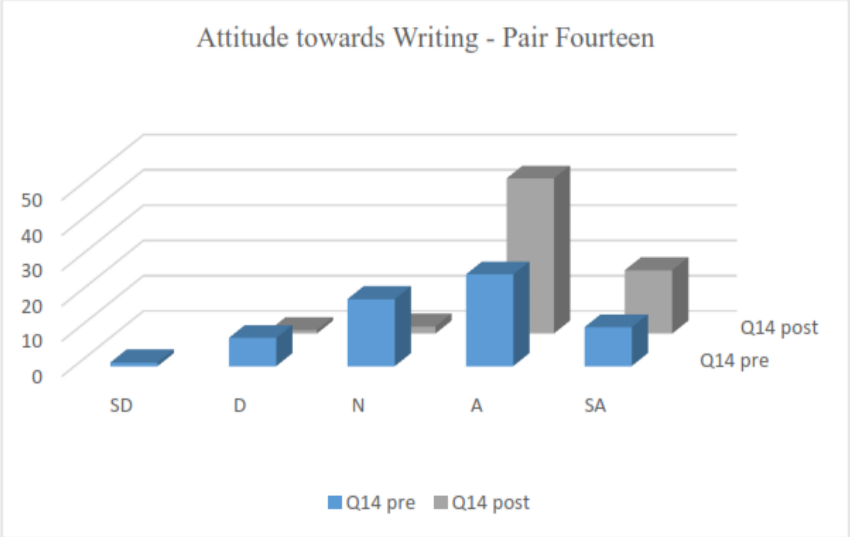

Figure 48. Students‘ Pre-Post attitude towards writing pair fourteen (IWB instruction)

The results of pair 15 indicated a noteworthy change between the mean values before regular prewriting instruction (M = 3.22, SD = 1.31) and after it (M = 4.23, SD= .58) and revealed a significant difference in attitude at P≤ .05, t (64) =-5.30, P= .00. The 95% confidence interval for the difference is between -1.40 and -.63. As Figure 49 shows, there is a shift in students‘ attitude after the IWB treatment, for almost all students approved that they felt relieved when they write their thoughts in English after the IWB prewriting instruction in contrast to what they felt before the IWB treatment.

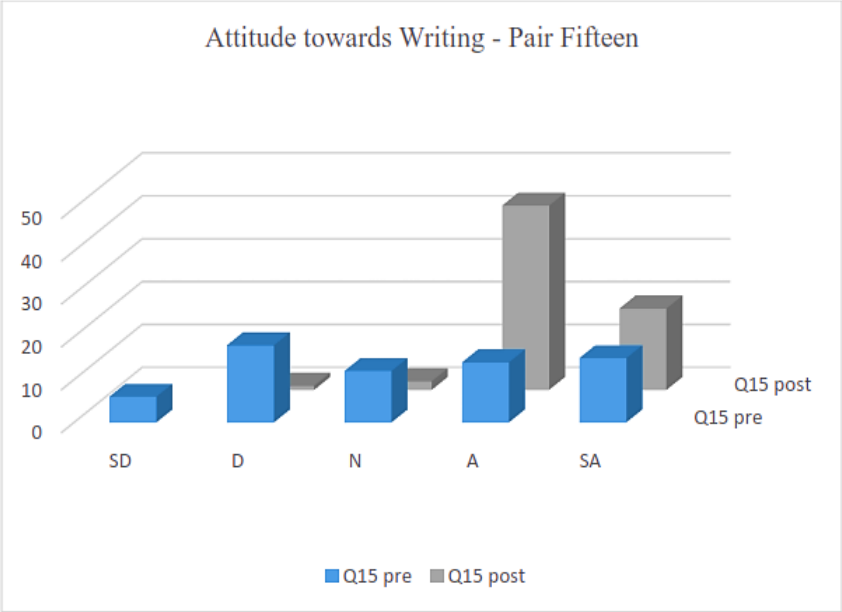

Figure 49. Students‘ Pre-Post attitude towards writing pair fifteen (IWB instruction)

To sum up, the IWB prewriting instruction has led to a remarkable change in the participants‘ attitude towards writing in the experimental group. This means that participants in the experimental group expressed positive attitudes towards writing after the IWB treatment. Therefore, the Alternative Hypothesis, The use of Interactive Whiteboard in pre-writing instruction boosts the attitudes of EFL students towards writing was retained.

Table 25

Descriptive Statistics of Student Attitude towards Writing regarding IWB Treatment

		N	*M*	*SD*
Pair 1	Writing in English is an enjoyable class activity	65	2.52	1.05
	Writing in English is an engaging activity after the Interactive Whiteboard pre-writing instruction	65	3.92	.78
Pair 2	I try to avoid the writing tasks in the English class	65	3.35	1.15
	I try to avoid the English writing tasks after the Interactive Whiteboard pre-writing instruction	65	1.92	.510
Pair 3	I like to write in English to communicate my ideas	65	2.63	1.04
	I become motivated to write about what I learned in the Interactive Whiteboard pre-writing activities	65	3.83	.72
Pair 4	I feel nervous when I can't find the proper vocabulary words to express my ideas	65	4.58	.71
	I feel less anxious to find proper vocabulary when I write after Interactive Whiteboard pre-writing activities	65	4.11	.79
Pair 5	When I write, I panic to remember the topic-related vocabulary words discussed in the pre-writing activities.	65	4.09	.86
	When I write, I panic to remember the topic-related vocabulary words discussed in the Interactive Whiteboard pre-writing instruction	65	1.92	.57
Pair 6	I feel tense during writing when I can't support my main ideas	65	4.20	.96
	It's difficult for me to support my ideas well in writing after the Interactive Whiteboard pre-writing instruction	65	1.95	.60
Pair 7	I like to use English when writing my diary	65	3.05	1.44
	I like to write in English after the Interactive Whiteboard pre-writing activities	65	4.23	.63
Pair 8	I waste much time to think of what I have to write about	65	4.03	.88
	I need much time to start writing even after the Interactive Whiteboard pre-writing activities	65	2.00	.61

Pair 9	Writing in English is a burden to me	65	3.29	1.23
	I no more view writing as a burden to me after doing the Interactive Whiteboard pre-writing activities	65	3.95	.62
Pair 10	I consider the writing period as the most boring among English periods	65	2.88	1.17
	I consider writing a boring activity even when the Interactive Whiteboard is used in pre-writing activities	65	2.06	.66
Pair 11	I get lost when I start writing in English	65	3.52	.99
	I get lost when I start writing in English even after the I Interactive Whiteboard pre-writing instruction	65	2.00	.69
Pair 12	I would like to learn all language skills except writing	65	3.46	1.11
	I would like to learn all language skills except writing even after the Interactive Whiteboard pre-writing instruction	65	2.05	.65
Pair 13	I feel confident when I write in English	65	2.48	.92
	I feel confident of what I write about after the Interactive Whiteboard pre-writing instruction	65	4.23	.63
Pair 14	I never seem able to develop my ideas well	65	3.58	.97
	I can develop my ideas well after the Interactive Whiteboard pre-writing activities	65	4.22	.57
Pair 15	I like seeing my thoughts on paper	65	3.22	1.31
	I feel relieved when I write my thoughts in English after the Interactive Whiteboard pre-writing instruction	65	4.23	.58

Table 26

Paired Samples Test of Student Attitude towards Writing regarding IWB Treatment

		95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Lower	Upper			
Pair 1	Writing in English is an enjoyable class activity - Writing in English is an engaging activity after the Interactive Whiteboard pre-writing instruction	-1.68	-1.12	-9.88	64	.00
Pair 2	I try to avoid the writing tasks in the English class - I try to avoid the English writing tasks after the Interactive Whiteboard pre-writing instruction	1.13	1.73	9.42	64	.00
Pair 3	I like to write in English to communicate my ideas - I become motivated to write about what I learned in the Interactive Whiteboard pre-writing activities	-1.50	-.90	-7.97	64	.00
Pair 4	I feel nervous when I can't find the proper vocabulary words to express my ideas - I feel less anxious to find proper vocabulary when I write after Interactive Whiteboard pre-writing activities	.21	.75	3.52	64	.001
Pair 5	When I write, I panic to remember the topic-related vocabulary words discussed in the pre-writing activities. - When I write, I panic to remember the topic-related vocabulary words discussed in the Interactive Whiteboard pre-writing instruction	1.94	2.40	18.51	64	.00
Pair 6	I feel tense during writing when I can't support my main ideas - It's difficult for me to support my ideas well in writing after the Interactive Whiteboard pre-writing instruction	1.99	2.51	17.07	64	.00
Pair 7	I like to use English when writing my diary - I like to write in English after the Interactive Whiteboard pre-writing activities	-1.60	-.77	-5.73	64	.00

Pair 8	I waste much time to think of what I have to write about - I need much time to start writing even after the Interactive Whiteboard pre-writing activities	1.78	2.28	16.38	64	.00
Pair 9	Writing in English is a burden to me - I no more view writing as a burden to me after doing the Interactive Whiteboard pre-writing activities	-1.02	-.31	-3.71	64	.00
Pair 10	I consider the writing period as the most boring among English periods - I consider writing a boring activity even when the Interactive Whiteboard is used in pre-writing activities	.56	1.12	5.43	64	.00
Pair 11	I get lost when I start writing in English - I get lost when I start writing in English even after the Interactive Whiteboard pre-writing instruction	1.25	1.79	11.25	64	.00
Pair 12	I would like to learn all language skills except writing - I would like to learn all language skills except writing even after the Interactive Whiteboard pre-writing instruction	1.08	1.75	8.34	64	.00
Pair 13	I feel confident when I write in English - I feel confident of what I write about after the Interactive Whiteboard pre-writing instruction	-2.05	-1.46	-11.92	64	.00
Pair 14	I never seem able to develop my ideas well - I can develop my ideas well after the Interactive Whiteboard pre-writing activities	-.90	-.36	-4.63	64	.00
Pair 15	I like seeing my thoughts on paper - I feel relieved when I write my thoughts in English after the Interactive Whiteboard pre-writing instruction	-1.40	-.63	-5.30	64	.00