CHAPTER IV

RESULTS

This chapter presents the results of the experiment conducted to compare the effects of the three methods of teaching, namely FTBI, TBI and CI on the students' English learning achievement and their writing ability. The results of hypothesis testing are presented according to hypotheses one to four. The results of the investigation of the students' attitude towards each treatment are lastly presented. The discussion of all findings is taken up in chapter 5.

4.1 Differences in the Learning Achievement among the Students Learning by the TBI, the FTBI and the CI

To address the hypothesis 1 which is "On average, there is no significant difference among the achievement test scores of students receiving different treatments", the data obtained with the posttest were performed by Kruskal-Wallis *H* test as shown in Table 4.1.

Table 4.1 Results of Measures by Kruskal-Wallis *H* Test for English Learning Achievement

Treatments	N	Mean Rank	Test Statistics	
			df	Asymp. Sig.
FTBI	30	48.1	2	0.708
TBI	31	43.26		
CI	31	48.19		

Table 4.1 displays the results of measures by the Kruskal-Wallis *H* test for the scores on the posttest, which tested the subjects' English language proficiency. The Kruskal-Wallis *H* test demonstrates no significant difference for three different treatments ($df = 2$, $H = 0.708$, $p < .03$). As can be seen, the treatments generally have more or less the same effect on the students' English learning achievement. So, the hypothesis was

accepted. However, it is noticeable that whether or not the treatments have positive effect on the students' English learning achievement. This, thus, deserves further analysis in order to see that the quite similar effect each treatment distributes is positive or negative. Tables 4.2 and 4.3 determine this.

Table 4.2: Descriptive Results by Measures for Pretest and Posttest Score

Treatment		N	Min.	Max.	$\bar{x}$	SD	Variance
TBI	Pretest	31	20	46.07	30.38	6.55	43.01
	Posttest	31	23	68.6	43.38	11.29	127.62
FTBI	Pretest	30	20	44.4	30.98	6.2	38.64
	Posttest	30	28	59.75	43.8	8.03	64.53
CI	Pretest	31	18.5	44.58	30.66	6.42	41.25
	Posttest	31	27.17	75	44.73	10.75	115.57

Table 4.2 summarizes the results of measures by the descriptive statistics for the scores on the pretest and posttest, which tested how far the subjects improved their English language proficiency. The mean and standard deviation among the three groups for the pretest is similar: for the TBI group, $\bar{x}$ = 30.38, *SD* = 6.55; for the FTBI group, $\bar{x}$ = 30.98, *SD* = 6.2; for the CI group, $\bar{x}$ = 30.66, *SD* = 6.42). This means that the three groups are similar in their language proficiency prior to the study. The posttest measures demonstrate that the mean scores between the three groups are similar but the average score of the FTBI group ($\bar{x}$ = 43.8, *SD* = 8.03) in its distribution varies from the mean less widely than those of the TBI group ($\bar{x}$ = 43.38, *SD* = 11.29) and CI group ($\bar{x}$ = 44.73, *SD* = 10.75). This indicates that the variability between the subjects' English language proficiency in the TBI is the greatest, and that in the FTBI group is the lowest, suggesting that the FTBI treatment tends to take care different students in improving their L2 learning

As has been proved, there is no significant difference on the posttest scores among the three groups receiving different treatments; analysis of the pre-post mean difference can determine whether or not the treatments have positive effect on the

learning improvement. Table 4.3 presents the measures for the differences between the pre and posttest results using Wilcoxon Signed Ranks test.

Table 4.3: Paired Samples Test for the TBI, FTBI and CI students

	N	Pre-Post Mean Difference	SD	*Z*-value
TBI	31	12.99	7.87	-4.700*
FTBI	30	12.82	8.84	-4.860*
CI	31	14.06	10.13	-4.762*

* $p < 0.05$

Table 4.3 displays the results of measures by paired samples-tests which were conducted to examine the differences in students' performance from pretest to post test on the TBI, FTBI and CI students. The result reveals that the CI group gains 1.07 points higher than the TBI group and the TBI group gains 0.17 points higher than the FTBI group. This signifies that the difference among the three groups is trivial. Also, the results indicate that all the three groups significantly improved from pretest to post test ($p<.05$). This statistically significant increase in gained score suggests that all three treatments have positive effect on the students' L2 learning.

4.2 Differences in the Grammatical Accuracy of Written Production of Students Learning by the TBI, the FTBI and the CI

To address hypothesis 2 which is "On average, there is no significant difference among the scores based on the accuracy aspects of the written production of the students receiving different treatments", ten pieces of writing belonging to ten mixed-ability students of FTBI, TBI and CI classes were the samples of the analyses. The data obtained from T-unit analyses and calculated by the Kruskal-Willis *H* test are shown in table 4.4. T-unit analyses on the writing production that the students completed in their writing tests 1, 2, 3 are shown in tables 4.5, 4.6, 4.7.

Table 4.4: Results of Analysis of Grammatical Accuracy

Source	Treatment	N	Mean Rank	Test Statistics	
				df	Asymp.Sig.
writing 1	FTBI	10	17.35	2	0.663
	TBI	10	15.35		
	CI	10	13.8		
writing 2	FTBI	10	17.35	2	0.663
	TBI	10	15.35		
	CI	10	13.8		
writing 3	FTBI	10	16.3	2	0.87
	TBI	10	14.35		
	CI	10	15.85		

Table 4.4 displays the results of statistical analysis of grammatical accuracy using the Kruskal-Wallis *H* test. In table 4.4, it is evident that the instructional effects for grammatical accuracy are not significantly different because the probability of their occurring at that level by chance was more than .03: for writing 1, $df = 2$, $H = .663$; for writing 2, $df = 2$, $H = .663$; for writing 3, $df = 2$, $H = .870$. So, the hypothesis was accepted. The results can be interpreted that the grammatical accuracy in the written production of the students receiving different treatments is more or less the same.

Table 4.5: Results of T-unit Analyses for Grammatical Accuracy of Writing 1

	FTBI			TBI			CI		
	T-units			T-units			T-units		
	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy
HA1	9	2	22	9	5	56	7	0	0
HA2	14	1	7	9	3	33	9	1	11
HA3	15	2	13	9	2	22	8	2	25
MA1	3	1	33	8	2	25	12	5	42
MA2	8	0	0	11	1	9	13	0	0
MA3	11	0	0	8	0	0	13	0	0
MA4	9	1	11	3	0	0	11	0	0
LA1	7	0	0	10	1	10	5	1	20
LA2	11	1	9	4	0	0	2	0	0
LA3	10	0	0	11	0	0	11	0	0
Total	9.7	0.8	9.5	8.2	1.4	15.5	9.1	0.9	9.8

Table 4.5 presents the results of T-unit analysis for grammatical accuracy of writing 1. It illustrates the total T-units, error free T-unit and percentage of accuracy produced by 10 subjects: 3 high (HA), 4 average (MA), and 3 low ability (LA) level students. The greatest total T-units is produced by the FTBI group (9.7 T-units), followed by the CI (9.1 T-units) and the TBI (8.2 T-units). The error free T-units produced by the TBI is the highest (1.4 T-units), followed by the CI (0.9 T-unit) and the FTBI (0.8 T-units). The percentage of accuracy of the TBI is the highest (15.5%), followed by the CI (9.8%) and the FTBI (9.5%). This means that the TBI group performs better on the grammatical accuracy in the first measure of the written production than the CI and the FTBI groups do.

Table 4.6: Results of T-unit Analyses for Grammatical Accuracy of Writing 2

	FTBI			TBI			CI		
	T-units			T-units			T-units		
	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy
HA1	7	4	57.0	7.0	5.0	71.0	5.0	2.0	40.0
HA2	9	4	44.0	4.0	2.0	50.0	9.0	3.0	33.0
HA3	7	2	29.0	3.0	1.0	33.0	10.0	6.0	60.0
MA1	8	4	50.0	7.0	2.0	29.0	8.0	3.0	38.0
MA2	7	1	14.0	8.0	3.0	38.0	4.0	1.0	25.0
MA3	5	4	80.0	5.0	1.0	20.0	5.0	1.0	20.0
MA4	9	5	56.0	4.0	0.0	0.0	6.0	3.0	50.0
LA1	5	1	20.0	3.0	1.0	33.0	2.0	0.0	0.0
LA2	9	2	22.0	5.0	2.0	40.0	2.0	0.0	0.0
LA3	8	3	38.0	7.0	3.0	43.0	5.0	2.0	40.0
Total	7.4	3	41.0	5.3	2.0	35.7	5.6	2.1	30.6

Table 4.6 displays the results of T-unit analysis for grammatical accuracy of writing 2. It illustrates the total T-units, error free T-unit and percentage of accuracy produced by 10 subjects: 3 high (HA), 4 average (MA), and 3 low ability (LA) level students. The greatest total T-units is produced by the FTBI group (7.4 T-units), followed by the CI (5.6 T-units) and the TBI (5.3 T-units). The error free T-units produced by the FTBI is the highest (3 T-units), followed by the CI (2.1 T-units) and the TBI (2T-units). The percentage of accuracy of the FTBI is the highest (41%), followed by the TBI (35.7%) and the CI (30.6%). As can be seen from data in table 4.6, the FTBI group performs better in terms of the grammatical accuracy in the second measure of the written production than the CI and the TBI groups do.

Table 4.7: Results of T-unit Analyses for Grammatical Accuracy of Writing 3

	FTBI			TBI			CI		
	T-units			T-units			T-units		
	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy	Total	Error-free	% Accuracy
HA1	11	3	27.00	10	5	50.00	6	1	17.00
HA2	12	2	17.00	10	5	50.00	7	0	0.00
HA3	10	2	20.00	4	0	0.00	10	1	10.00
MA1	13	2	15.00	7	0	0.00	9	5	56.00
MA2	9	2	22.00	10	2	20.00	6	1	17.00
MA3	8	1	13.00	5	3	60.00	8	2	25.00
MA4	9	1	11.00	2	0	0.00	11	4	36.00
LA1	6	3	50.00	6	1	17.00	2	0	0.00
LA2	12	2	17.00	5	0	0.00	2	0	0.00
LA3	15	0	0.00	9	0	0.00	6	3	50.00
Total	10.5	1.8	19.2	6.8	1.6	19.7	6.7	1.7	21.1

Table 4.7 displays the results of T-unit analysis for grammatical accuracy of writing 3. It illustrates the total T-units, error free T-unit and percentage of accuracy produced by 10 subjects: 3 high (HA), 4 average (MA), and 3 low ability (LA) level students. The greatest total T-units is produced by the FTBI group (10.5 T-units), followed by the TBI (6.8 T-units) and the CI (6.7 T-units). The error free T-units produced by the FTBI is the highest (1.8T-units), followed by the CI (1.7 T-units) and the TBI (1.6 T-units). The percentage of accuracy of the CI is the highest (21.1%), followed by the TBI (19.7%) and the FTBI (19.2%). This is evidence that the CI group performs better in terms of the grammatical accuracy in the third measure of written production than the TBI and the FTBI groups do.

4.3 Analysis of Writing Ability

This study also sought to compare the effects of the TBI, the FTBI and the CI on the students' writing ability and their effect sizes. The answer to this problem is reported in tables 4.8, 4.9, and 4.10. Table 4.8 illustrates the results of the comparison using the

Kruskal Wallis *H* test. Table 4.9 is informative, giving the descriptive statistics measures for the writing ability. And table 4.10 is evident that which treatment has better effect on the students' writing ability.

Table 4.8: Results of Kruskal-Wallis *H* Test Analysis of Writing Ability

Treatments	n	Mean Rank	df	Asymp.Sig.
Writing 1 FTBI	30	48.93	2	.061
TBI	31	37.58		
CI	31	53.06		
Writing 2 FTBI	30	55.77	2	.057
TBI	31	44.06		
CI	31	39.97		
Writing 3 FTBI	30	57.26	2	.003*
TBI	31	34.26		
CI	31	48.39		

*$p < .03$

Table 4.8 reports the results of Kruskal Wallis *H* test analysis of the students' writing ability. As shown in table 4.7, the effect of each treatment on the students' writing ability varies: for writing 1, $df = 2$, $H = .061$; for writing 2, $df = 2$, $H = .057$; and for writing 3, $df = 2$, $H = .003$*. The results reveal that the effect of the instruction on the writing ability in writing 3 is significant: $p < .03$. This means that one treatment has significant effect on the students' writing ability. Further analyses are needed in order to explain and prove this significant difference. Table 4.8 give data derived from the descriptive statistics and table 4.9 report the results of the post-hoc multiple comparison, *i.e.*, the rank sum test, and is evidence that one treatment distributes better effect than another.

Table 4.9: Descriptive Statistics of Writings 1, 2 and 3

	N	Minimum	Maximum	Mean	*SD*
Writing 1					
FTBI	30	0.7	16.7	11.1	3.7
TBI	31	0.0	16.3	10.0	3.6
CI	31	4.0	16.7	11.7	2.8
Writing 2					
FTBI	30	2.7	23.7	15.4	5.0
TBI	31	0.5	28.0	10.0	3.6
CI	31	4.7	20.7	11.7	5.7
Writing 3					
FTBI	30	7.0	19.7	13.8	3.5
TBI	31	5.0	20.7	10.3	4.9
CI	31	6.0	20.3	12.4	3.8

Table 4.9 displays the descriptive statistics for the scores from writing tests 1, 2, and 3. It illustrates the mean scores, standard deviation, minimum as well as maximum scores of the FTBI, TBI and CI groups. The results show that in writing one, the mean scores and the standard deviations among the three group are not widely different: for the FTBI, $\bar{x}$ = 11.1, *SD* = 3.7; for the TBI, $\bar{x}$ = 10, *SD* = 3.6; for the CI, $\bar{x}$ = 11.7, *SD* = 2.8. This small difference in the group mean score and its standard deviation means that the three treatments distribute more or less the same effect on the students' writing ability.

In writing 2 the results show that the mean scores and the standard deviations among the three groups are different: the FTBI group gains the highest score ($\bar{x}$ = 15.4, *SD* = 5), followed by the CI group ($\bar{x}$ = 11.7, *SD* = 5.7) and the TBI group ($\bar{x}$ = 10, *SD* = 3.6). This can be interpreted that the FTBI treatment exerts its effect and distributes better positive effect on the students' writing ability than the CI and TBI treatments.

In writing 3 the results show that the mean scores and the standard deviations of the FTBI and CI groups are quite similar and that the FTBI group gains the highest score ($\bar{x}$ = 13.8, *SD* = 3.5), and closely followed by the CI group ($\bar{x}$ = 12.4, *SD* = 3.8) and then the TBI group ($\bar{x}$ = 10.3, *SD* = 4.9). This means that the FTBI treatment and the CI

treatment distribute better positive effects on the students' writing ability than the TBI treatments.

Since it was found that there is a significant difference in writing 3, table 4.10 determines which treatment has better effect on the students' writing ability.

Table 4.10: Results of the Post-hoc Multiple Comparison on Writing 3

Source	Sum Rexp	Zobt	Eta Squared
FTBI&TBI	930	3.03*	0.153
TBI&FTBI	961	-3.044*	
TBI&CI	961	-2.17*	
CI&TBI	976.5	2.386*	0
CI&FTBI	961	-1.6	
FTBI&CI	930	1.6	

*p<.03

Table 4.10 displays the results of the post-hoc multiple comparison – the rank sum test – on writing 3. The following significant differences are seen: the FTBI group performed significantly better than the TBI group (p<.03), and the CI group performed significantly better than the TBI group (p<.03). This indicates that the FTBI treatment has better effect on the students' writing ability than the CI and TBI treatments, and that the CI treatment has better effect on the students' writing ability than the TBI treatment does. However, the eta square's analyses report that the effect size is trivial (less than 0.2). This tends to suggest that there is no significant difference among the groups at the practical level.

4.4 Relationship between Grammatical Accuracy of Writing and Writing ability

To address the hypothesis 4, which is "There is no significant relationship between the grammar ability and writing ability of the students", the data derived from the analysis of the T-unit score of grammatical accuracy in writing tests 1, 2 and 3 and the scores of the writing tests 1, 2 and 3 representing the students' writing ability of 10 samples who were purposively selected. They were 3 high, 4 average and 3 low proficient students of three groups. The results of the analyses are presented in table 4.10.

Table 4.11: Correlation of Grammatical Accuracy and Writing Ability for TBI, FTBI and CI groups

	N	r_{xy}	r^2	d
TBI	31	.583*	0.339	1.43
FTBI	30	.559*	0.312	1.34
CI	31	.600*	0.36	1.5

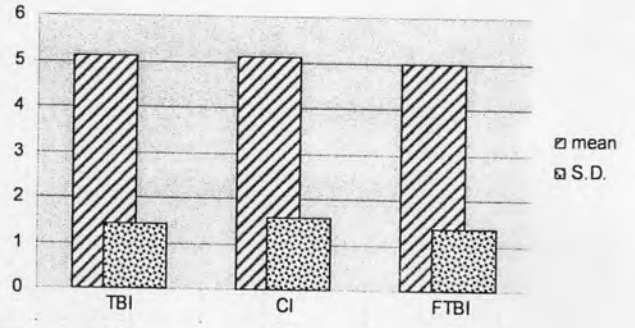
* p<.05 (2-tailed)

Table 4.11 displays the Pearson Correlation between the grammatical accuracy and the writing ability for the TBI, FTBI and CI groups. The results reveal that the writing ability and grammatical accuracy of the three groups is positively and moderately correlated and a statistically significant correlation is obtained. This means that as the students' grammatical accuracy increases, their writing ability increases, or vice versa. However, the moderate correlation indicated that there might have other variables independent on the grammatical accuracy that influence the students' writing ability. The results also indicate that the magnitude of the correlation (r^2) between the grammatical accuracy and the writing ability of the CI, TBI and FTBI groups is low (less than .40), that is, the grammatical accuracy accounts for about 31%-36% of the variables determined the students' writing ability. This signifies that the grammar ability of these students is developing towards the mastery of the target language.

4.5 Students' Attitude towards the teaching

The impacts of the three treatments were also investigated from the students' attitude using a semantic differential questionnaire consisting of a series of questions on how they perceived the effectiveness of the instructional treatments. Figure 5.1 presents results of the investigation of the students' attitude towards FTBI, TBI and CI treatments using the semantic differential scale. Figure 5.2 reports the dimensional attitude towards the treatments.

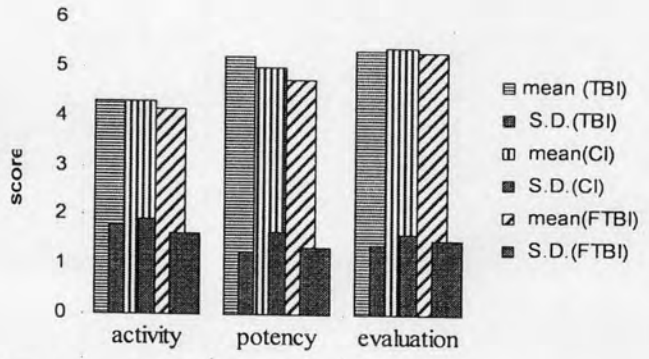
Figure 4.1: Results of Analysis on the Students' Attitude towards FTBI, TBI and CI



	TBI	CI	FTBI
mean	5.12	5.1	4.98
S.D.	1.42	1.6	1.35

Figure 4.1 shows that their attitudes towards the instructional treatments are quite similar: TBI and CI groups are quite positive: score of the TBI group is the highest, $\bar{x}$ = 5.12, *SD* = 1.59; score of the CI group, $\bar{x}$ = 5.1, *SD* = 1.7; the FTBI students' attitude towards the treatment is slightly positive, $\bar{x}$ = 4.98, *SD* = 1.54. The results provide evidence that students have quite similar positive attitude although they receive different methodological approaches.

Figure 4.2: Results of Analysis on the Evaluative, Activity, and Potency Dimensions on the Students' Attitude towards FTBI, TBI and CI



	activity	potency	evaluation
mean (TBI)	4.3	5.23	5.34
S.D.(TBI)	1.8	1.25	1.42
mean(CI)	4.29	5	5.4
S.D.(CI)	1.92	1.67	1.64
mean(FTBI)	4.15	4.75	5.3
S.D.(FTBI)	1.64	1.35	1.52

Figure 4.2 presents results of the investigation of the students' evaluative dimensional attitude of the treatments, students' perception of their own potency during

the treatment and the students' attitude towards the activities exploited during the treatment. The results summarize that the evaluative dimension of the three groups is quite positive (for TBI, $\bar{x}$ = 5.34, SD = 1.42; for CI, $\bar{x}$ = 5.4, SD = 1.64; for FTBI, $\bar{x}$ = 5.3, SD = 1.52). For the potency dimension, the results show that the attitude of the TBI and CI groups is quite positive (for TBI, $\bar{x}$ = 5.23, SD = 1.25; for CI, $\bar{x}$ = 5, SD = 1.67) and that of the FTBI group is slightly positive ($\bar{x}$ = 4.75, SD = 1.35). This suggests that the students in the FTBI, TBI and CI groups accept the three instructional treatments as very good teaching methods and they found that the three treatments need little adjustment. With regards to the potency dimension, the result can be interpreted that the TBI group put more effort on learning than the CI and the TBI students did.