CHAPTER IV

RESULTS OF DATA ANALYSIS

This study was designed to investigate the effect of synchronous and asynchronous Web-based instruction in task-based instruction (convergent and divergent tasks) on English language learning achievement of the undergraduate students at Kasetsart University. The variables in this study were WBI (SL and ASL) and TBI (convergent and divergent tasks). The descriptive data of the subjects were the mean scores and standard deviations from the first and second part of the achievement test. The results from the repeated measures Analysis of Variance (ANOVA) -the main effects, the interaction effects and effect sizes of the two IVs (TBI and WBI) were presented and followed by the descriptions of frequencies and percentage of students' opinions on WBI environments.

Descriptive Data of the Subjects

The subjects of the two experimental groups were described by means and standard deviations obtained from the two parts of the achievement test. The data can be seen in Table 4.

Table 4. Means and Standard Deviations of English Language Learning Achievement between WBI and TBI

WBI	TBI	Mean	Std. Deviation
Synchronous	Convergent	33.3039	7.30074
	Divergent	31.0069	5.23874
	Total	32.1554	6.42690
Asynchronous	Convergent	29.0882	5.30067
	Divergent	28.1863	5.30279
	Total	28.6373	5.29485

n = 51 for each group

Table 4 shows that the highest mean scores are the synchronous convergent group ($\bar{x}$ = 33.3009, n =51), and the lowest mean scores are the asynchronous divergent group ($\bar{x}$ = 28.1863, n =51).

Comparison of the Treatments on Learning Achievement

To investigate the effects of SL and ASL Web-based instruction in convergent and divergent tasks on English language learning achievement, 2× 2 ANOVA with repeated measures was conducted to find the main effects and interaction effects between two IVs (TBI and WBI) on DV (achievement). The data for ANOVA analysis with repeated measures were obtained from the achievement test of which the mean scores from both parts of the test were used in the analyses for main effects and interaction effect. The results were used to test the hypotheses set for this study. The results of the analyses were shown in Table 5-6.

Table 5. Tests of Within-Subjects Contrasts

Source	WBI	Type IV Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
WBI	Linear	631.242	1	631.242	40.193	.000	.287
WBI*TBI	Linear	24.815	1	24.815	1.580	.212	.016
Error (WBI)	Linear	1570.529	100	15.705			

$P < 0.05$ n =51 for each group

Table 5 reveals that there is a significant difference between SL and ASL at the 0.05 level ($p<.05$, $F= 40.193$). This means there is a difference between the two groups. The mean scores in SL ($\bar{x}$ = 32.1554) are higher than ASL ($\bar{x}$ =28.6373). This yields that SL is significantly better than ASL. Moreover, the results indicate no interaction effect found between TBI and WBI at the 0.05 significant level ($p>.05$, $F=$ 1.580). The plotted graph of the interaction effect between TBI and WBI can be seen in Graph 1.

As illustrated in this table, the effect size value of WBI is 0.287 (see the values in column Partial Eta Squared). This means that the degree of association between main effects, and interaction effect, a linear contrast, and the achievement is large (Cohen, 1988 cited in Ary, Jacobs and Razavieh, 2002: 360). The large effect size confirmed the departure of 5 percent points from the null hypothesized value. It also indicated that the average mean scores of SL were equivalent to a score with a percentile rank of approximately 90 while the mean scores of ASL were at the percentile rank of 50.

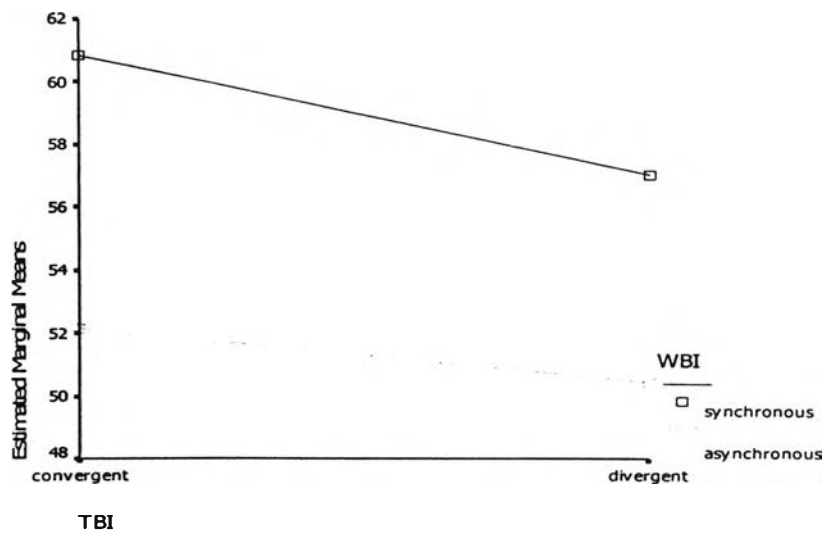
Table 6. Tests of Between-Subjects Effects

Source	Type IV Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	188483.043	1	188483.043	3571.403	.000	.973
TBI	130.480	1	130.480	2.472	.119	.024
Error	5277.563	100	52.776			

$P < 0.05$ n =51 for each group

Table 6 reveals that there is no significant difference between convergent and divergent tasks at the 0.05 level (p>.05, F= 0.119).

As illustrated in this table, the effect size value of TBI is 0.024 (see the values in column Partial Eta Squared). This means that the degree of association between main effects, and interaction effect, a linear contrast, and the achievement is medium (Cohen, 1988 cited in Ary, Jacobs and Razavieh, 2002: 360). In this case it would say that the significance test had inadequate power to detect a departure of 5 percent points from the null hypothesized value. It also indicated that the average means scores of both convergent and divergent tasks were close to the percentile rank of 50.



Graph 1. Plot of the Interaction Effect between TBI and WBI

Graph 1 shows the plotted graph of the mean scores in TBI and WBI. The lines illustrate no interaction between TBI and WBI.

Opinions on Web-based Learning Environments

Students' opinions on WBI environments were presented according to the four questions in the questionnaire. The first question asking for the opinions on

environment that facilitates learning was presented in Table 7. The second question asking for the opinions on environment that enhanced learning achievement was presented in Table 8. The third question asking for the opinions on environment that enhanced motivation was presented in Table 9. The last question asking for the opinions on environment that enhanced attitude toward learning English was presented in Table 10.

Table 7. Frequency and Percentage of Opinions on Environment that Facilitates Learning

	Frequency	Percent	Valid Percent	Cumulative Percent
SL	33	37.5	37.5	37.5
ASL	53	60.2	60.2	97.7
SL&ASL	2	2.3	2.3	100.0
Total	88	100.0	100.0	

n = 88

Table 7 shows that 60.2 percent of the subjects indicated asynchronous learning facilitated Web-based learning, and 37.5 percent indicated synchronous learning. The opinions reveal that the highest percent of subjects (60.2%) thought that asynchronous learning facilitated Web-based instruction.

Table 8. Frequency and Percentage of Opinions on Environment that Enhances Learning Achievement

	Frequency	Percent	Valid Percent	Cumulative Percent
SL	23	26.1	26.1	26.1
ASL	45	51.1	51.1	77.3
Both	2	2.3	2.3	79.5
Uncertain	13	14.8	14.8	94.3
Convenient	4	4.5	4.5	98.9
Worsen	1	1.1	1.1	100.0
Total	88	100.0	100.0	

n = 88

Table 8 shows that 51.1 percent of the subjects indicated asynchronous learning enhanced learning achievement, and 26.1 percent indicated synchronous learning.

There was only 1.1 percent of the subjects indicated that Web-based learning environments worsened their learning achievement.

Table 9. Frequency and Percentage of Opinions on Environment that Enhances Motivation

	Frequency	Percent	Valid Percent	Cumulative Percent
SL	14	15.9	15.9	15.9
ASL	29	33.0	33.0	48.9
Both	3	3.4	3.4	52.3
Uncertain	41	46.6	46.6	98.9
Worsen	1	1.1	1.1	100.0
Total	88	100.0	100.0	

n = 88

Table 9 shows that 46.6 percent of the subjects indicated that they were uncertain whether SL or ASL enhanced motivation while 33 percent indicated asynchronous learning and 15.9 percent indicated synchronous learning. There was only 1.1 percent of the subjects indicated that Web-based learning environments worsened their motivation in learning.

Table 10. Frequency and Percentage of Opinions on Environment that Enhances Attitude toward Learning English

	Frequency	Percent	Valid Percent	Cumulative Percent
	6	6.8	6.8	6.8
ASL	28	31.8	31.8	38.6
Both	6	6.8	6.8	45.5
Uncertain	48	54.5	54.5	100.0
Total	88	100.0	100.0	

n = 88

Table 10 shows that 54.5 percent of the subjects indicated that they were uncertain whether SL or ASL enhanced attitude toward learning English while 31.8 percent indicated asynchronous learning. The smallest number of subject (6.8 percent) indicated that both SL and ASL enhanced their attitude toward learning English.

Summary of the Results

The focus of this part was to report the results of data analysis. The data obtained from the achievement test were analyzed for main effects and interaction effects using Factorial ANOVA with repeated measures design. From the data analysis, the crucial results obtained revealed that there was no significant difference found between convergent and divergent tasks in terms of learning achievement. The only significant difference found was between SL and ASL. The results showed that achievement scores performed in SL were significantly higher than scores performed in ASL. Moreover, there was no interaction effect found between TBI and WBI.

Based on the opinions from the questionnaire, 60.2 and 51.1 percent of the subjects indicated that ASL was the environment that facilitated learning and enhanced higher achievement in Web-based learning respectively. When asking which environment enhanced motivation, 46.6 percent of the subjects indicated that they were uncertain. However, there were 33 percent of them indicating ASL. Additionally, 54.5 percent were uncertain whether ASL or SL could enhance higher attitude toward learning English. Furthermore, some students expressed their opinions in the questionnaire that they wanted to have teacher stay online with them so that they could ask questions and get immediate responses. Moreover, they could not control themselves when they studied alone and this caused the motivation reduction.