CHAPTER FOUR

RESULTS, INTERPRETATIONS AND DISCUSSIONS

4.1 Introduction

This chapter will discuss the results of this study. The interpretations and discussions are based on the descriptive and inferential statistics analyses of relationships.

4.2 Descriptive and Inferential Statistics Analyses of Relationships

This section will discuss the findings and its significance. The focus will be on academic achievement for both groups, the influence of gender on achievement and the students' perception towards the use of computers.

The t-test analyses on significance was conducted on all the mean data ranging from achievement score to perception score on using computers. The level of significance was set at $p < .05$

4.2.1 The *t*-test Comparisons of Mean Achievement Scores

The *t*-test comparisons of mean achievement scores for both groups, CAI and Non-CAI Group are shown in Table 4.1 below.

Table 4.1
The *t*-test Comparisons of Mean Achievement Scores for
CAI and Non-CAI Group

	Pre-CAI Treatment	Post-CAI Treatment	Gains	*t*-value	Significance ($p < .05$)
CAI Group :					
(n=30) Mean	25.47	27.57	2.10	0.77	Not Significant
SD	3.31	5.88	4.85		
Non-CAI Group :					
(n=30) Mean	22.45	24.00	3.22		
SD	3.10	1.22	4.41		

In the CAI group (n=30), the mean achievement score before the CAI treatment was 25.47 (SD = 3.31) (Table 4.1). However, it increased to 27.57 (SD = 5.88) after the treatment. This indicates that CAI method is able to improve academic achievement in Geography.

The mean achievement score for the Non-CAI Group increased from 22.45 (SD = 3.10) to 24.00 (SD = 3.22) which also shows improvement. This proves that traditional classroom teaching is still one of the useful teaching tool in improving achievement.

By comparing the mean CAI Gain and the Non-CAI Gain, the CAI Gain was slightly higher at 2.10 (SD = 4.85) compared to Non-CAI Gain which was only 1.22 (SD = 4.41). This clearly indicates that the CAI method is more effective in improving academic achievement than traditional classroom method.

To answer the first research question which is on the effectiveness of the CAI method, we refer to Table 4.1 above. The *t*-value, 0.77, was not significant This means that CAI method was effective in improving students' academic achievement compared to the traditional classroom method but it was not significant at this level. The mean CAI Gain was not significant probably because the sample size was too small. If the sample size increases, the result will surely be significant at this level of significance.

4.2.2 The *t*-test Comparisons of Achievement Scores for Boys and Girls

Table 4.2 below shows the *t*-test comparisons of achievement scores for boys and girls for both groups.

Table 4.2
The *t*-test Comparisons of Achievement Scores for Boys and Girls

	Pre-CAI Treatment		Post-CAI Treatment		Gains		*t*-value	Significance ($p < .05$)
	Boys n=15	Girls n=15	Boys n=15	Girls n=15	Boys n=15	Girls n=15		
CAI Group:								Not Significant
Mean	24.43	26.50	25.80	29.33	1.37	2.83	-0.82	
SD	3.63	2.69	7.60	2.69	6.01	3.37		
Non-CAI Group:								
Mean	22.13	22.77	23.60	24.40	0.80	1.63		
SD	3.71	2.44	2.64	2.76	3.87	4.31		

The mean achievement scores for girls for both groups were higher compared to boys. Table 4.2 shows that the mean achievement scores for the boys in the CAI Group were 24.43 (SD = 3.63) and 25.80 (SD = 7.60) in the Pre-CAI and Post-CAI respectively. These were lower compared to the girls' achievement which recorded 26.50 (SD = 2.69) in the Pre and 29.33 (SD = 2.69) in the Post. The boys' mean CAI Gain was only 1.37 (SD = 6.01) compared to 2.83 (SD = 3.37) for the girls.

To answer the second research question which investigates the influence of gender on CAI, we refer to Table 4.2 above. The t-test analyses showed a t-value of -0.824 which was not significant. This indicates that although girls perfomed better than boys in term of academic achievement, but the gain was not significantly different at this level of significance. The academic achievement in CAI sessions was not influenced by gender. It is to be noted that a significant result can be possibly obtained if we increase the sample size. The present sample size of 30 subjects is considered too small.

The girls performed better than boys in academic achievement might be due to their attention in the CAI sessions. The facilitator of the CAI Group reported that girls paid more attention during the CAI lessons compared to boys. The Ministry of Education's statistics also showed that boys recorded more disciplinary problems than girls in schools. The statistics of the Malaysian Examination Board also proved that girls had better academic achievement in PMR (Lower Secondary School Assessment) and SPM (Malaysia Examination Certificate) than boys in the past public examinations.

4.2.3 The t-test Comparisons of Students' Perceptions of CAI

Data on students' perception was gathered through questionnaires distributed to the sample subjects (CAI Group only) (n=30) before and after the CAI treatment. Table 4.3 shows the frequency and the percentages of students' positive perception towards the use of computers in CAI method after the CAI treatment :

Table 4.3
Frequency Distribution and Percentages in Perception Score in
Using Computers of the CAI Group
(n = 30)

Score	Level of Positive Perception	Pre-CAI	%	Post-CAI	%
27-36	High Positive Perception	-	-	12	40.0
18-26	Moderate Positive Perception	10	33.3	13	43.3
9-17	Low Positive Perception	16	53.4	5	16.7
1-8	Very Low Positive Perception	-	-	-	-
0	No Perception	4	13.3	-	-
	Total	n = 30	100	n = 30	100

The Pre-CAI questionnaire result showed that only four students with perception scores in using computers less than 8 (Table 4.3) or 13.3 percent of the sample population. However, no students recorded below this score in the Post-CAI questionnaire. Twenty six students scored 9 and above in the Pre-CAI session and the number had increased to thirty in the Post-CAI session. Twelve of them or 40 percent showed a very high positive perception towards CAI.

Table 4.4 shows the mean perception score in using computers for the CAI Group for the Pre and Post session :

Table 4.4
The *t*-test Comparisons of Students' Perceptions of CAI
before and after the CAI treatment
(n = 30)

	Pre-CAI Treatment	Post-CAI Treatment	*t*-value	Significance (*p* < .05)
Mean	6.90	23.80	19.60	Significant
SD	5.16	6.65		

To answer the third research question which is on whether teaching using computers enhances students' perception of computers, we refer to Table 4.4 above. In the Pre-CAI session, the mean perception score towards the use of computers was only 6.90 (SD = 5.16) and it had increased to 23.80 (SD = 6.65) in the Post-CAI session.

The t-value 19.60 was not significant. This indicates that students' perception of computers was enhanced significantly when they learned using computers. The students' positive perception towards CAI possibly because of computer curiosity as 22 of the subjects had no computer applications knowledge prior to the CAI sessions. They might have found that learning through computers was really fun and interesting. This might have caused them to perceive CAI positively.

Table 4.5 shows the mean perception score in using computers for the CAI Group according to gender :

Table 4.5
The t-test Comparisons of Students' Perception
of CAI for Boys and Girls

	Post-CAI		t-value	Significance ($p < .05$)
	Boys (n=15)	Girls (n=15)		Not Significant
Mean	22.27	25.33	-1.28	
SD	7.54	5.46		

To answer the fourth research question which is on whether boys perceive better than girls in CAI, we refer to Table 4.5 above. According to the table , the mean perception score for girls in CAI was 25.33 (SD = 5.46) whereas boys scored 22.27 (SD = 7.54). The t-value was -1.28. It was not significant. The result which was not significant indicates that boys did not perceive better than girls in the use of computers in CAI sessions. Although girls' perception score was higher compared to boys but it was not significant at this level.

The higher score for girls clearly indicates that girls accepted CAI as a learning tool better than boys did. This might be caused by girls' "Easy to accept" attitude compared to boys "Ready to challenge" attitude. It might be true because girls are easier to persuade than boys (Sigelman and Shaffer, 1995).