

## CHAPTER IV

### RESULTS AND ANALYSIS

The questionnaire and the tests were conducted to 94 higher vocational level students who studied Business English I course at Chiangrai Commercial School in Chiangrai during the academic year of 2001. The age, gender and ethnics of the learners were not included in the study.

The data obtained from the tests: pre-test, post-test, unit pre-test, unit post-test and questionnaire, distributed to the subjects, were analyzed and interpreted using Statistical Packages for the Social Sciences (SPSS). The results were interpreted as follows:

#### The Test Results and Analysis

Table 6. Means of the Pre-Test in Critical Thinking Skills of the Students.

Teaching method	No. of students	Total score	Mean	Sig.
Traditional group work	46	90	29.04	.92
Cooperative learning method	48	90	29.02	

From Table 8, the pre-test scores reveal that there is no significant difference between the critical thinking ability of the students in the control group who were taught by the traditional group work and the students in the experimental group taught by cooperative learning at  $p < .05$  level. It can be interpreted that both groups of students had an equal ability in critical thinking skills.

Table 9. Means of the Post-Test in Critical Thinking Skills of the Students

Teaching method	No. of students	Total score	Mean	Sig.
Traditional group work	46	90	45.15	.00
Cooperative learning method	48	90	52.68	

After studying for eight weeks, the result from the post-test shows that there is a significant difference in the critical thinking ability of both groups. The critical thinking ability of the students who were taught through the traditional group work (Mean 45.15) was lower than that of the students who were taught by the cooperative learning (Mean 52.68). The statistical difference was significant at  $p < .05$  level.

Table 10. Mean of the Unit Pre- Tests and Unit Post-Tests of the Students Who Were Taught through the Traditional Group Work

Unit	No. of students	Total score	pre-test mean	post-test mean	Sig.
Unit 1	46	15	8.06	9.78	.00
Unit 2	46	15	5.67	7.86	.00
Unit 3	46	15	1.58	6.26	.00
Unit 4	46	15	5.77	8.02	.00
<b>Total mean</b>			<b>5.27</b>	<b>7.58</b>	

In table 10, the test results in the unit pre-post test scores on the critical thinking skills are shown. When compared the mean of unit pre-tests (5.27) and the unit post-tests ( 7.58) of traditional group work students, it was found that the mean of post-tests of the traditional group was higher than those of pre-tests. The result from the t-test reveals that there is significant difference in pre-test and post-test means of the students in every unit at  $p < .05$  level.

Table 11. Mean of the Unit Pre- Tests and Unit Post-Tests of the Students Who Were Taught through the Cooperative Learning Method

Unit	No. of students	Total score	pre-test mean	post-test mean	Sig.
Unit 1	48	15	8.04	12.89	.00
Unit 2	48	15	4.60	10.43	.00
Unit 3	48	15	1.87	5.27	.00
Unit 4	48	15	7.50	10.31	.00
<b>Total mean</b>			<b>5.50</b>	<b>9.73</b>	

The result shows that the critical thinking mean of the cooperative learning students in the post-test (9.73 ) is also higher than mean scores of the pre- test (5.50). When compared the mean of post-test scores of both groups, the mean of the cooperative learning group (9.73) is higher than that of the traditional group (7.58). The result from the t-test shows that there is significant difference in pre-test and post-test means of the students in every unit at  $p < .05$  level.

Table 12. Means of the Unit Post-Tests of the Students Who Were Taught through the Traditional Group Work and Cooperative Learning Method

Test item scores	Mean of Traditional group	Mean of Cooperative learning group	Sig.
Unit1= 15	9.78	12.89	.00
Unit2= 15	7.86	10.43	.00
Unit3= 15	6.26	5.27	.02
Unit4= 15	8.02	10.31	.00

Table 12 shows the students' mean scores of the critical thinking skills in each unit post- test. The critical thinking mean of all unit post- tests of the cooperative learning group are significantly different from those of the traditional group at  $p < .05$  level.

Mean of the critical thinking skills of students who were taught through the cooperative learning in units 1,2 and 4 were higher than those of the students who were taught through the traditional group work. In the contrast, it found that mean of the traditional group in unit 3 was lower than the cooperative learning group. The reason of this is the students had the accounting exam before they took the post-test, so they were mentally fatigue to think and could not concentrate on the test in English course.

Table 13. Means of Three Critical Thinking Skills Test of the Students Who Were Taught through the Traditional Group Work

Critical thinking skills	Pre-test			Post-test		
	No. of total scores	Mean	Level of skills	No. of total scores	Mean	Level of skills
Analysis	30	7.52	Minimal skilled	30	14.73	Basically skilled
Synthesis	30	11.41	Minimal skilled	30	16.67	Basically skilled
Evaluation	30	10.10	Minimal skilled	30	13.89	Basically skilled

Levels of skill 0-6 =unskilled (unacceptable),7-12= minimally skilled( low level), 13-18 = basically skilled( mixed level), 18-23= skilled( commendable), 24-30 = highly skilled( excellent).

Table 13 shows the means of three different critical thinking skills scores from pre-test and post-test of traditional group. After learning for eight weeks, the means of post-test scores of the traditional group work were higher than means of pre-test scores. All of the students' critical thinking skills increased from the low level to the mixed level.

Table 14. Means of Three Critical Thinking Skills Test of the Students Who Were Taught through the Cooperative Learning Method.

Critical thinking skills	Pre-test			Post-test		
	Total scores	Mean	Level of skills	Total scores	Mean	Level of skills
Analysis	30	8.58	Minimal skilled	30	15.31	Basically skilled
Synthesis	30	11.25	Minimal skilled	30	20.85	Skilled
Evaluation	30	9.37	Minimal skilled	30	16.52	Basically skilled

Levels of skill 0-6 =unskilled (unacceptable),7-12= minimally skilled (low level), 13-18 = basically skilled( mixed level), 18-23= skilled (commendable), 24-30 = highly skilled( excellent).

The result in table 14 shows the mean of three critical thinking skill scores of the cooperative group students. The findings reveal that at the beginning of teaching, all of the means of critical thinking skills were in the low level. After studying for eight weeks, all critical thinking skills' mean were higher. The two critical thinking skills (analysis and evaluation skills) of the students who were taught through the cooperative learning were in the mixed level, while the synthesis skills were in the commendable level.

Table 15. Means of the Total Scores of Three Critical Thinking Skills of the Students.

Critical thinking skills	Post-test			
	Total scores	Traditional group	Cooperative learning group	Sig.
Analysis	30	14.73	15.31	.45
Synthesis	30	16.67	20.85	.00
Evaluation	30	13.89	16.52	.00
	90	45.29	52.68	

The result in table 15 shows the means of the post-test scores of three critical thinking skills in both groups. At the beginning, all critical thinking skills of both groups were in the same level. The findings reveal that after studying for eight weeks, the means of three critical thinking skills: analysis, synthesis and evaluation of the cooperative group were higher than those of the traditional group. However, the critical thinking skills in the analysis level of the students in both groups had no significant difference, while the other two types of critical thinking skills (synthesis and evaluation level) of both groups were significantly different at .05 level. It can be concluded that the skills in synthesis and evaluation of the cooperative group were significantly better than those of the traditional group.



## Questionnaire Results and Analysis

The 48 students in cooperative learning group were asked to complete the questionnaire after finishing the post-tests. Mean was employed to analyze the data from the questionnaire. The results from the questionnaire were described under the heading: The opinion on cooperative learning method. There were six main topics in the questionnaire: (1) the positive interdependence, (2) face to face interaction, (3) individual accountability, (4) social skills (5) group processing, and (6) self-evaluation on their learning and thinking ability after being taught through cooperative learning.

Table 16. An Analysis of Students' Opinions Toward the Positive Interdependence Skills Arranged by Using an Ascending Mean

Opinion toward the positive interdependence	Mean	Level of Cooperation
Each group member has a specific responsibility.	3.81	Moderately cooperative
Group members help one another to achieve the good scores and team rewards.	4.29	Highly cooperative
Group members share materials or resources with the others.	4.39	Highly cooperative
<b>Total Mean</b>	<b>4.16</b>	<b>Moderately cooperative</b>

Mean levels: 1.00-1.80 = Minimally cooperative; 1.81-2.60= Basically cooperative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately cooperative; 4.21-5.00 = Highly cooperative

Table 16 shows the students' opinion of the positive interdependence. Mean for the opinions towards the positive interdependence skills is 4.16. This mean can be interpreted that the students are moderately cooperative in the positive interdependence skills. Group members are highly cooperative in sharing materials or resources with the others (Mean 4.39) and in helping one another to achieve the good scores and team rewards (Mean 4.29).

Table 17. An Analysis of Students' Opinions Toward Face to Face Interaction Skills Arranged by Using an Ascending Mean

<b>Opinion toward face to face interaction skills</b>	<b>Mean</b>	<b>Level of Cooperation</b>
Group members encourage everyone to give effort in learning.	3.97	Moderately cooperative
Group members explain ideas to the others orally.	4.14	Moderately cooperative
Group members assist one another in learning materials and doing tasks.	4.18	Moderately cooperative
<b>Total Mean</b>	<b>4.09</b>	<b>Moderately cooperative</b>

Mean levels: 1.00-1.80 = Minimally cooperative; 1.81-2.60= Basically cooperative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately cooperative; 4.21-5.00 = Highly cooperative

Table 17 shows the opinion of the students towards face to face interaction skills. The mean 4.09 can be interpreted that the students have moderate cooperation in face to face interaction skills. The highest mean of this skill is focusing on the group members to assist one another in learning materials and doing tasks (Mean 4.18).

Table 18. An Analysis of Students' Opinions Toward individual Accountability Skills Arranged by Using an Ascending Mean

<b>Opinion toward individual accountability skills.</b>	<b>Mean</b>	<b>Level of Cooperation</b>
I have the responsibility for my own learning.	3.72	Moderately cooperative
I help the other group members to master all of the assigned work.	3.85	Moderately cooperative
I contribute my work to the other group members.	4.16	Moderately cooperative
<b>Total Mean</b>	<b>3.91</b>	<b>Moderately cooperative</b>

Mean levels: 1.00-1.80 = Minimally cooperative; 1.81-2.60= Basically cooperative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately cooperative; 4.21-5.00 = Highly cooperative

From Table 18, it shows the opinion of the students towards individual accountability skills. Mean for the opinions towards individual accountability skills is 3.91. It reveals that the students are moderately cooperative in individual accountability skills. The highest mean of the individual accountability skills is: I contribute my work to the other group members (Mean 4.16).

Table 19. An Analysis of Students' Opinions Toward Social Skills Arranged by Using an Ascending Mean

Opinion toward social skills	Mean	Level of Cooperation
I give reasons to support my ideas.	3.93	Moderately cooperative
I listen to other people's opinions and accept others' ideas, even if I do not agree.	4.58	Highly cooperative
Group members consult one another to make the best decision.	4.60	Highly cooperative
<b>Total Mean</b>	<b>4.37</b>	<b>Highly cooperative</b>

Mean levels: 1.00-1.80 = Minimally cooperative; 1.81-2.60= Basically cooperative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately cooperative; 4.21-5.00 = Highly cooperative

Table 19 shows the opinion of the students towards social skills. Mean for the opinions towards social skills is 4.37. This can be indicated that the students have high cooperation in other social skills. The high cooperation in other social skills are: group members are highly cooperative in consulting one another to make the best decision (Mean 4.60) and in listening to other people's opinions and in accepting others' ideas, even if they do not agree (Mean 4.58).

Table 20. An Analysis of Students' Opinions Toward Group Processing Skills Arranged by Using an Ascending Mean

<b>Analysis of students' opinion toward group processing skills</b>	<b>Mean</b>	<b>Level of Cooperation</b>
Group members give feedback after doing the task for improving the next task.	3.64	Moderately cooperative
Group members work out by using various strategies to create the group products.	4.06	Moderately cooperative
Group members discuss the purpose and the goal of the assignment.	4.31	Highly cooperative
<b>Total Mean</b>	<b>4.00</b>	<b>Moderately cooperative</b>

Mean levels: 1.00-1.80 = Minimally cooperative; 1.81-2.60= Basically cooperative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately cooperative; 4.21-5.00 = Highly cooperative

Table 20 shows the opinion of the students towards group processing skills. The result reveals that the students are moderately cooperative in group processing skills.(Mean 4.00) The highest mean of group processing skills is that the group members discuss the purpose and the goal of the assignment.(Mean 4.31)

Table 21. An Analysis of Self-Evaluation on Learning and Thinking Ability Arranged by Using an Ascending Mean

<b>Self-evaluation on learning and thinking ability</b>	<b>Mean</b>	<b>Level of Opinion</b>
I find that I am better able to understand the lessons after learning in a group.	3.95	Moderately positive
I find that I am better able to do the exercise or test about the materials after learning in a group.	4.00	Moderately positive
I find that I am better in having the various ideas in thinking after learning in a group.	4.04	Moderately positive
I find that I am better in expressing ideas after learning in a group.	4.06	Moderately positive
I find that I am better in studying in cooperative learning group than studying in the traditional classroom.	4.58	Highly positive
<b>Total Mean</b>	<b>4.12</b>	<b>Moderately positive</b>

Mean levels: 1.00-1.80 = Highly negative; 1.81-2.60 = Moderately negative; 2.61-3.40 = Neutral; 3.41-4.20 = Moderately positive; 4.21-5.00 = Highly positive

From Table 21, the statistics reveal that the students have a highly positive opinion that they were better in studying in cooperative learning group than studying in the traditional classroom (Mean 4.58) , and they have a moderately positive opinion that they were better in expressing ideas after learning in a group. (Mean 4.06). For the overall opinion, students have a moderately positive opinion on the self-evaluation on learning and thinking ability (Mean 4.12).

Table 22. The Highest and Lowest Means of the Students' Opinion Toward Cooperative Learning Method.

Opinions	Mean	SD
The group members consult one another to make the best decision.	4.60	.64
The group members give feedback after doing the task for improving the next task.	3.64	.72

Table 22 shows that a large amount of the students agree strongly that while, they work in a group, group members consult one another to make the best decision (Mean 4.60). On the other hand, the students thought that they do not always give feedback after doing the task for improving the next task.(Mean 3.64).