

CHAPTER 5

Main Study

5.1 Instruments

The Perceptual Learning Style Preferences Survey (PLSPS) by Reid (1987) was chosen as the instrument in this study for determining the students' PLSP. The survey was successfully tried out with two groups from different schools and proved to be valid and reliable.

5.2 Participants

The subjects were 137 Thai secondary school students who were learning English as a foreign language (EFL) in Chiang Mai, Thailand. The subjects, 114 boys and 20 girls, had been attending Wichai Wittaya Bilingual School since 2002. For the exact numbers of students at each of the school year levels, see table 8 below.

Table 8: Number of students in each grade in Wichai Wittaya Bilingual School

School year level	Boys	Girls	Total
	N	N	
Grade 7	40	20	60
Grade 8	46	-	46
Grade 9	31	-	31
Total	117	20	137

Participants' ages ranged from 12-13 in Grade 7, 13-14 in Grade 8 and 15-16 in Grade 9. On the day that the survey was tried out three boy students were absent.

In this study, students' English proficiency was not tested so the questionnaire had been translated into Thai. This study's focus was on the educational perspectives of learning style preferences but not on the dimension of students' English proficiency level. The subjects had more or less the same educational background within their grade level. They had gone through at least five years of compulsory education and had had teachers who came from almost the same educational background.

At Wichai Wittaya Bilingual School students' English proficiency level was good because English was the medium of instruction in 70% of the taught subjects. All the English language teachers are foreigners. Thus, it was observed that students did not have difficulty understanding and responding to the questionnaire and instructions. The school is co-educational, with both boy and girl students, so that learning styles could be compared according to students' gender.

5.3 Data Collection Procedure

The data was collected by the researcher during the third week of January 2004. I wrote a formal permission request letter to the school administration long before that, and the administration set the date and period when the students would be given the survey questionnaire. Thus, the students responded to the

questionnaire during class time with the subject teacher there ready to help them with any problem.

I gave the survey questionnaire to the teachers in envelopes and talked to the English teachers about administering the PLSPS. Then the PLSP form and directions were provided and the students were told that they could ask for any clarification and that they might need extra time as they filled out the questionnaire.

From the pilot study it was clear that students understood the questionnaire and, because of this, the earlier planned introduction talk was cancelled. On the other hand the short talk could have caused a misunderstanding and lead students to satisfy the researcher so verbal instructions were not given to students.

Although the subjects had no obligation to fill out and hand in the questionnaire, all of them completed the survey forms and submitted them. After completing the survey, the students were divided into two groups according to their gender.

Since a large number of students were not involved in the present study, the questionnaires were administered once. Most of the students had no difficulty understanding the questionnaire. All the students worked on the questionnaire in their own classroom with the English teacher remaining in the classroom until every student had finished answering all the questions. The questionnaire administration took approximately 8-10 minutes of each class.

5.4 Analysis and Interpretation of Data

The statistical procedures used to answer the research questions as follows: data analyzed by using the SPSS (Statistical Package for Social Science). Frequency, percentages and mean score used to determine the students' PLSP. T-tests used to determine if there was any correlation between gender and learning styles. MS Excel 2000 software used to process the data so that it could be displayed in bar graph form.

5.5 Item Responses

The data obtained from the questionnaire was processed with SPSS and the analysis is shown below, in Table 9.

A high mean can be seen for the items which measure kinesthetic learning. For instance, item 26, "I learn best in class when I can participate in related activities"; item 19, "I understand things better in class when I participate in role-playing"; and item 15, "I enjoy learning in class by doing experiments." The dominant perceptual learning style for females and males is kinesthetic with a p value of 0.772, which was very far from being 0.05.

Table 9. Mean by gender with significant value for each item.

ITEM	Mean (M)			Sig.
	Female	Male	Total	P
1. When the teacher tells me the instructions, I understand better.	2.95	3.32	3.26	0.150
2. I prefer to learn by doing something in class.	4.05	3.76	3.81	0.208
3. I get more work done when I work with others.	3.00	3.65	3.55	0.005*
4. I learn more when I study with group.	3.50	3.76	3.72	0.283
5. In class, I learn best when I work with others.	3.10	3.39	3.35	0.203
6. I learn better by reading what the teacher writes on the chalkboard.	4.05	3.34	3.45	0.001*
7. When someone tells me how to do something in class, I learn it better.	3.55	3.95	3.89	0.060
8. When I do things in class, I learn better.	3.25	3.74	3.66	0.024*
9. I remember things I have heard in class better than things I have read.	3.30	3.32	3.31	0.951
10. When I read instructions, I remember them better.	4.20	3.93	3.97	0.135
11. I learn more when I can make a model of something.	3.90	3.87	3.87	0.875
12. I understand better when I read instructions.	4.35	3.99	4.04	0.056*
13. When I study alone, I remember things better.	3.30	3.33	3.33	0.910
14. I learn more when I make something for a class project.	3.70	3.69	3.69	0.974
15. I enjoy learning in class by doing experiments.	3.95	4.46	4.38	0.010*
16. I learn better when I make drawings as I study.	3.00	2.96	2.96	0.881

ITEM	Mean (M)			Sig.
	Female	Male	Total	P
17. I learn better in class when the teacher gives a lecture.	3.90	3.78	3.80	0.596
18. When I work alone, I learn better.	3.30	3.25	3.26	0.869
19. I understand things better in class when I participate in role-playing.	4.30	3.93	3.99	0.078
20. I learn better in class when I listen to someone.	3.40	3.51	3.49	0.665
21. I enjoy working on assignment with two or three classmates.	3.45	3.75	3.70	0.222
22. When I build something, I remember what I have learned better.	4.15	3.99	4.01	0.433
23. I prefer to study with others.	3.70	3.55	3.57	0.478
24. I learn better by reading than by listening to someone.	4.00	3.39	3.49	0.014*
25. I enjoy making something for a class project.	3.95	3.62	3.67	0.104
26. I learn best in class when I can participate in related activities.	4.35	3.85	3.93	0.015*
27. In class, I work better when I work alone.	3.10	3.37	3.33	0.298
28. I prefer working on projects by myself.	3.15	3.36	3.33	0.394
29. I learn more by reading textbooks than by listening to a lecture.	3.90	3.28	3.37	0.004*
30. I prefer to work by myself.	3.55	3.72	3.69	0.549

(* Statistically significant difference * $p \leq 0.05$ M= mean)

The Standard Deviations, by gender, of the responses to the survey questions are presented in Table 10. From these it can be seen that for item 3 males' preferences are more narrowly ranged than females: there is, in other words, less agreement on this item between females than between males. For item 29, by contrast, the standard deviation for females is smaller than for males. It can be concluded that females are more visual than males.

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Table 10. Standard deviation of responses by gender with significant value for each item.

ITEM	Standard Deviation (SD)			Sig.
	Female	Male	Total	P
1. When the teacher tells me the instructions, I understand better.	1.10	1.03	1.05	0.150
2. I prefer to learn by doing something in class.	.83	.95	.94	0.208
3. I get more work done when I work with others.	1.17	.89	.96	0.005*
4. I learn more when I study with group.	1.19	.97	1.01	0.283
5. In class, I learn best when I work with others.	.97	.95	.95	0.203
6. I learn better by reading what the teacher writes on the chalkboard.	.69	.91	.91	0.001*
7. When someone tells me how to do something in class, I learn it better.	.94	.85	.87	0.060
8. When I do things in class, I learn better.	.91	.87	.89	0.024*
9. I remember things I have heard in class better than things I have read.	.73	1.11	1.06	0.951
10. When I read instructions, I remember them better.	.70	.75	.75	0.135
11. I learn more when I can make a model of something.	.85	.83	.83	0.875
12. I understand better when I read instructions.	.49	.80	.77	0.056*
13. When I study alone, I remember things better.	1.03	1.24	1.21	0.910
14. I learn more when I make something for a class project.	.92	.87	.88	0.974
15. I enjoy learning in class by doing experiments.	.94	.77	.81	0.010*
16. I learn better when I make drawings as I study.	1.21	1.20	1.20	0.881

ITEM	Standard Deviation (SD)			Sig.
	Female	Male	Total	P
17. I learn better in class when the teacher gives a lecture.	.85	.94	.92	0.596
18. When I work alone, I learn better.	1.22	1.13	1.14	0.869
19. I understand things better in class when I participate in role-playing.	.86	.86	.87	0.078
20. I learn better in class when I listen to someone.	1.14	1.02	1.03	0.665
21. I enjoy working on assignment with two or three classmates.	1.15	.97	1.00	0.222
22. When I build something, I remember what I have learned better.	.67	.86	.83	0.433
23. I prefer to study with others.	.86	0.85	0.85	0.478
24. I learn better by reading than by listening to someone.	.73	1.04	1.02	0.014*
25. I enjoy making something for a class project.	.69	.85	.83	0.104
26. I learn best in class when I can participate in related activities.	.67	.86	.86	0.015*
27. In class, I work better when I work alone.	1.07	1.06	1.06	0.298
28. I prefer working on projects by myself.	1.09	1.00	1.01	0.394
29. I learn more by reading textbooks than by listening to a lecture.	.72	.90	.90	0.004*
30. I prefer to work by myself.	1.15	1.16	1.16	0.549

(* Statistically significant difference * $p \leq 0.05$ SD= standard deviation)

It can be seen that the mean showed significant differences for item 3 ($p=0.005$), item 6 ($p=0.001$), and items 8, 12, 15, 24, 26, 29 ($p \leq 0.05$). Thus, there are significant differences in learning style preference between the females and males. These differences are highlighted below in Table 11.

Table 11. Standard deviation and mean by gender with significant value.

Item	Mean		Standard Deviation		Sig. P
	Female	Male	Female	Male	
6. I learn better by reading what the teacher writes on the chalkboard.	4.05	3.34	.69	.91	0.001*
29. I learn more by reading textbooks than by listening to a lecture.	3.90	3.28	.72	.90	0.004*
3. I get more work done when I work with others.	3.00	3.65	1.17	.89	0.005*
15. I enjoy learning in class by doing experiments.	3.95	4.46	.94	.77	0.010*
24. I learn better by reading than by listening to someone.	4.00	3.39	.73	1.04	0.014*
26. I learn best in class when I can participate in related activities.	4.35	3.85	.67	.86	0.015*
8. When I do things in class, I learn better.	3.25	3.74	.91	.87	0.024*
12. I understand better when I read instructions.	4.35	3.99	.49	.80	0.056*

Female students highly favor visual learning compared to the male students. When students' learning styles are ordered according to significance values, the most significant differences are for visual learning, with higher mean scores and lower standard deviations compared to males. Both females and males like to work with friends but item 3 (group learning) shows a significant

difference between males and females. Boys favor group work more than girls.

Both females and males like to study according to their kinesthetic learning style:

there is no significant difference and the mean score is high for both genders.

However when items 15, 26 and 8 are taken individually, they show that there is a significant difference between females and males in terms of kinesthetic learning style.

The age is one of the factors affecting the learning styles. In this study the participants' grade levels were different and their age was ranging from 12 to 16. In order to see how age factor influences students learning styles one-way ANOVA was carried out by comparing Wichai Wittaya Bilingual School students' grade level and perceptual learning styles.

Table 12. One-way ANOVA by class and learning styles.

Learning styles		Sum of Squares	df	Mean Square	F	Sig.
Visual	Between Groups	27.139	2	13.570	1.958	.145
	Within Groups	908.062	131	6.932		
	Total	935.201	133			
Auditory	Between Groups	19.951	2	9.976	1.754	.177
	Within Groups	744.922	131	5.686		
	Total	764.873	133			

Learning styles		Sum of Squares	df	Mean Square	F	Sig.
Kinesthetic	Between Groups	7.372	2	3.686	.689	.504
	Within Groups	700.986	131	5.351		
	Total	708.358	133			
Tactile	Between Groups	.481	2	.240	.043	.958
	Within Groups	734.243	131	5.605		
	Total	734.724	133			
Group	Between Groups	4.226	2	2.113	.103	.903
	Within Groups	2699.662	131	20.608		
	Total	2703.888	133			
Individual	Between Groups	47.662	2	23.831	1.847	.162
	Within Groups	1689.860	131	12.900		
	Total	1737.522	133			

According to the ANOVA, there is no significant difference in learning styles by participants' grade level. We therefore do not know whether participants learning styles vary by age (in this close range) or not.

5.6. Interpretation of Grouped Items

5.6.1 Learning Style of Wichai Wittaya Bilingual School Students

One of the purposes of the study was to determine secondary level Thai students' learning styles. I found the kinesthetic learning to be the dominant learning style in the both groups. In terms of the major learning style, 99 (74%) of the subjects had a dominant style of the kinesthetic type, followed by the visual at 64 (48%). The percentage of other learning styles can be seen below in Table 13.

Table 13: Frequency and Percentage of Wichai Wittaya Bilingual School Students' Learning Style Preferences

Learning styles	Major	Minor	Neg.
Visual	64 47.8%	68 50.7%	2 1.5%
Auditory	47 35.1%	85 63.4%	2 1.5%
Kinesthetic	99 73.9%	34 25.4%	1 0.7%
Tactile	55 44%	79 59%	0 0%
Group	52 38.8%	78 58%	4 3%
Individual	40 29.9%	81 60.4%	13 9.7%

Table 13 displays the preferred LS by students within each group (major, minor, and negligible)

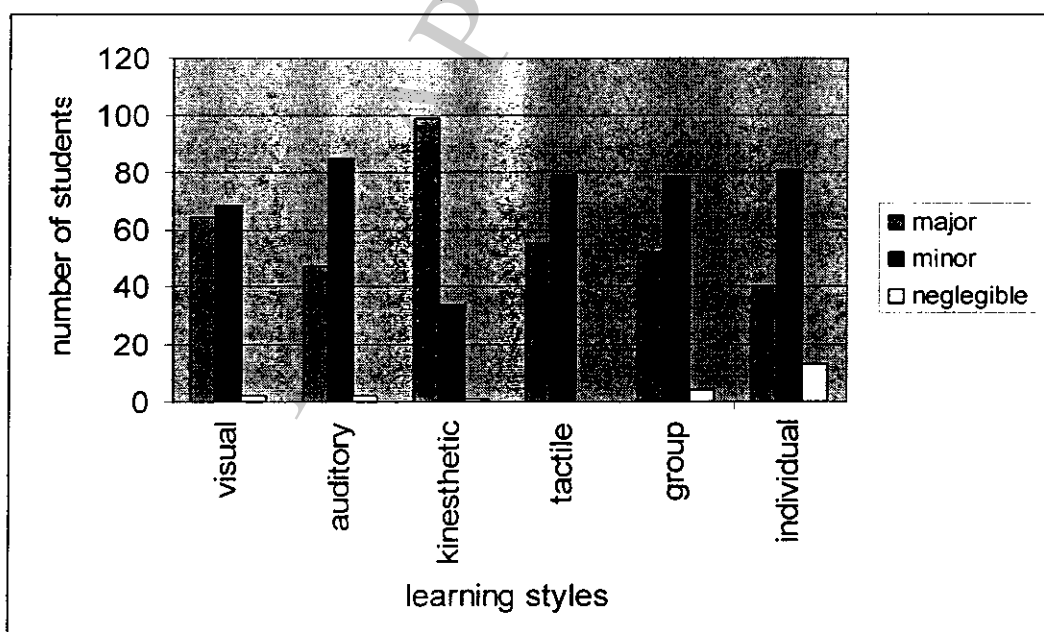
Some of the results for Thai students are parallel to Reid's general results for Thai adult ESL learners studying in the United States. In Reid's study (1987), Thai learners' major learning style preferences were kinesthetic and tactile. In this

study, students strongly preferred kinesthetic learning, followed by visual and tactile learning. In Reid's study, individual seems to be students' first choice of minor learning style; however, in this study, auditory learning is the students' first choice of minor learning style, followed by individual, tactile and group. It is possible that the auditory learning style is the students' choice (which still they can perform well in) because they have very limited opportunities for speaking English outside of the classroom. In general, Thai students responded to the survey positively; very few students chose a negative learning style, perhaps because, as I mentioned in the pilot study, students hesitate to respond the questionnaire negatively.

My findings and Reid's findings are partly different, particularly in terms of age and the year of studying English in a foreign country.

A summary of the data is provided in the accompanying bar graph.

Figure 2: Major, Minor, and Negligible Learning Style of WWBS Students



5.6.2 Gender and Learning Style of Wichai Wittaya Bilingual

School Students

Table 14: Mean, Standard Deviation, Significant Value for Learning Style and Gender

Learning Styles	Gender	Mean	SD	P
Visual	M	35.88	5.20	0.000*
	F	41.00	3.52	
Auditory	M	35.74	4.90	0.187
	F	34.20	3.99	
Kinesthetic	M	39.47	4.76	0.772
	F	39.80	3.55	
Tactile	M	36.26	4.79	0.320
	F	37.40	4.16	
Group	M	36.54	5.93	0.042*
	F	33.50	7.13	
Individual	M	34.07	7.24	0.471
	F	32.80	7.21	

As shown in Table 14, the result of the independent t-test indicates significant differences in the perceptual learning style preferences between females and males. The visual learning is significant with $p=0.000$ and group learning $p=0.042$.

As can be seen from the mean, both genders, females and males prefer visual learning but females more strongly prefer to study through visual. Visual learning style seems to be not only Thai students' preference of learning style but

that of Asian students' in general. This may reflect the dominance of traditional classroom teaching in most of Asian countries, where learning is mainly through reading and copying work from the board. For instance, during my observations as a teacher most of the time, female students like to take neat notes and prefer the teacher to write on the board whatever they are studying at the moment.

Males prefer group study more than females. This result is similar to the results of the pilot study. They prefer to work with two or more than two friends while learning. Restak (1979) says, for instance, that boys are significantly more peer-oriented than girls so many boys need to learn with peers rather than with their teacher because they often find demanding working with teacher.

Table 15: Frequency and Percentage of Student Learning Style Preferences by Gender

Learning Style	Male N=114			Female N=20		
	Major	Minor	Neg.	Major	Minor	Neg.
Visual	47 41%	65 57%	2 1.8%	17 85%	3 15%	0 0%
Auditory	44 38.6%	68 59.6%	2 1.8%	3 15%	17 85%	0 0%
Kinesthetic	83 72.8%	30 26.3%	1 0.9%	16 80%	4 20%	0 0%
Tactile	44 38.6%	70 61.4%	0 0%	11 55%	9 45%	0 0%
Group	46 40.4%	66 57.9%	2 1.8%	6 30%	12 60%	2 10%
Individual	34 29.8%	70 61.4%	10 8.8%	6 30%	11 55%	3 15%

Table 15 displays the preferred LS by students within each group (major, minor, and negligible)

One of the purposes of my study was to determine if there existed differences in the choice of learning style between females and males among WWBS secondary level students. I found the kinesthetic learning style to be the students' first choice of learning style in both groups. Males' first preference of learning style is kinesthetic 83 (72.8%), followed by group 46 (40.4%), visual 47 (41%), auditory and tactile 44 (38.6%). Male students seem to have more negative

(negligible) preference for individual learning than female students. Females' first preference of learning style is visual learning 17 (85%), followed by kinesthetic learning 16 (80%) which is very close to their first choice of learning style. The tactile learning follows for 11 (55%) students. The details can be seen in Table 15.

A summary of the data is provided below in the accompanying bar graph.

Figure 3: Major, Minor, and Negligible Learning Style of WWBS Students' by Gender

