CHAPTER 4

Results

The purpose of this chapter is to present the result of this study by separating and describing each phase. The researcher will present and follow up the research questions.

4.1 Phase One: Exploratory study of information processing strategy application on Academic and Play activities identified by the PRPP System: Thai Version in Thai children with learning disabilities

4.1.1 Research Question 1

'What levels of task mastery do Thai children with learning disabilities demonstrate while performing Academic and Play activities as measured by the PRPP System: Thai version, Stage One Analysis ?'

Answers to this question were generated using descriptive analysis. All task performance mastery scores obtained on the PRPP Stage One were reduced to one mean score per person. The same reduction process was applied to scores for each error type. The output data from this computation were analyzed using descriptive statistics to identify the means, standard deviations and percentiles for mastery and errors. All performances were measured against a pre-determined criterion of 100% as reported in the PRPP Training Manual (Chapparo & Ranka, 2006), and consistent with other studies where the PRPP Assessment has been used (Aubin et al., 2009; Nott & Chapparo, 2007).

4.1.2 Demographic characteristics

C	eneral data	n=30	Percentage (%)
Sex			
	Male	25	83.33
	Female	5	16.67
Age	9.0-9.11	1	3.33
(Years)	10.0 - 10.11	12	40.00
	11.0 - 11.11	1919191	36.67
	12.0 - 12.11	910111106 91	20.00
Grade	4	D 0 10 2	33.33
	5		36.67
	6	9	30.00

Table 4.1 Demographic characteristics of the sample group (n=30)

The demographic characteristics of the sample are shown in Table 4.1. Thirty children with LD who met the inclusion criteria were selected to participate in the study. Their average age were 10.8 years old. Most of them were males (83.33%) and studying in the 5th grade (36.67%).

4.1.3 Level of Task Mastery

The assessment activities in this study were categorized into two types of activity: academic activity and play activity, based on the Occupational Therapy Practice Framework: Domain and Process (2nd Edition) in school aged children and level of academic and play development. Activities in Academic activity included reading comprehension and written expression activity, while activities in Play activity included cognitive game, movement activity, and competitive play. The assessment was done under naturalistic contexts which were familiar to the participants. The researcher established a criterion of 100% and the range of mastery percentage score was measured by PRPP Stage One in a sample of 30 students. The results of master performance are shown in Table 4.2 and Figure 4.1.

ities assessment	Min %	Max%	Mean%	St. Dev.%
reading	14.29	85.71	46.19	25.36
comprehension and				
written expression				
cognitive game	28.57	85.71	41.81	13.49
movement activity	33.33	100	66.11	25.57
competitive play	40	100	84.68	16.86
	ities assessment reading comprehension and written expression cognitive game movement activity competitive play	ities assessmentMin %reading14.29comprehension andwritten expressioncognitive game28.57movement activity33.33competitive play40	ities assessmentMin %Max%reading14.2985.71comprehension andwritten expressioncognitive game28.5785.71movement activity33.33100competitive play40100	ities assessmentMin %Max%Mean%reading14.2985.7146.19comprehension andwritten expressioncognitive game28.5785.7141.81movement activity33.3310066.11competitive play4010084.68

Table 4.2 Stage One Mastery percentages by level of each task assessment (N=30)



Figure 4.1 Stage One Mastery percentages by level of each task assessment

From Table 4.2 and Figure 4.1, it summarizes the results of level of Mastery in each assessment activity. The results are described in the following assessment activities.

 Academic activity: reading comprehension and written expression activity

Because all participants had both reading and writing problems, the researcher used reading comprehension and written expression activity, including reading a story, using words to fill an information gap, read and answer questions about a story, as assessment activity. The difficulty levels of story depended on grad levels of each sample.

The range of mastery percentage score was from 14.29% -85.71% with a mean score of 46.19% and standard deviation of 25.36%. This result demonstrates that all children had difficulty mastering their performance in Academic tasks.

2) Play activity: cognitive game, movement activity, competitive play

2.1) cognitive game: Jigsaw, Puzzle, Maze

The range of mastery percentage score was 28.57% - 85.71% with a mean score of 41.81% and standard deviation of 13.49%. This result indicates that completing the tasks presented challenges to the children.

2.2) movement activity: searching for the treasure on the map, bouncing the ball with two hands in a zigzag manner and throwing the ball into the basket

The movement activities results show that all children had difficulty mastering their performance in movement activity. The range of mastery percentage score was 33.33% - 100% with a mean score of 66.11% and standard deviation of 25.57%.

2.3) competitive play: Domino, Bingo, Stacking

The competitive play results indicate that children had lower difficulties than another assessment activity in this study with most of the children reaching a full score. The range of mastery percentage score was 40% - 100% with a mean score of 84.68% and standard deviation of 16.86%.

In summary, the results from Table 4.2 and Figure 4.1 illustrate that the mean Mastery total percentage score for the sample fell below criterion 100% on all assessment activities. The mean score of reading comprehension and written expression activity was 46.19, cognitive game was 41.81, movement activity was 66.11, and competitive play was 84.68. Cognitive game was considered the most problematic in the samples because this activity is the lowest mean percentage scores, followed by reading comprehension and written expression activity, movement activity and competitive play. This indicates that most of children in the sample did not meet the established criterion level for safe and effective application of information processing strategies during tasks performed in contexts.

4.1.4 Mastery of errors impacting on performance

When we consider the four types of errors impacted on mastery, the result are presented in the Table 4.3 and Figure 4.2. Table 4.3 illustrates the means, standard deviations and rage for PRPP Stage One errors scores and Figure 4.2 show the means of PRPP Stage One errors scores.

Activities as	sessment	Error Type	Min %	Max %	Mean%	St. Dev.%
Academic	reading	Acc	16.67	83.33	63.33	23.32
	comprehension	Rep	0.00	16.67	0.56	3.04
	and written	Omi	0.00	16.67	8.33	8.48
	expression	Tim	0.00	83.33	56.11	28.86
Play	cognitive game	Acc	14.29	42.86	39.24	9.43
		Rep	0.00	20.00	2.40	5.64
		Om	0.00	20.00	4.95	7.20
		Tim	14.29	57.14	39.43	10.37
	movement	Acc	0.00	60.00	30.56	23.05
	activity	Rep	0.00	33.33	13.89	15.21
//	activity	Om	0.00	33.33	15.22	10.74
	\$ / _	Tim	0.00	40.00	7.67	12.13
1/ 28	competitive	Acc	0.00	40.00	8.19	10.52
12	nlav	Rep	0.00	0.00	0.00	0.00
1/ 19/	piay	Om	0.00	20.00	6.67	8.50
	1 15	Tim	0.00	60.00	11.14	14.79

Table 4.3 Stage One error percentages of all activities by error type

Note. Acc = Accuracy errors, Rep = Repetition errors, Om = Omission errors, Tim = Timing errors



Figure 4.2 The means of PRPP Stage One errors scores

Base on the results of Table 4.3, it can be explained in each type of activity as follows:

 Academic activity: reading comprehension and written expression activity

The most frequent error was Accuracy errors (Mean error score = 63.33%). The next most frequent errors type impacting on mastery was Timing errors (Mean error score = 56.11%). Children were too slow for the time limit. This was followed by Omission errors (Mean error score = 8.34%) and Repetition errors (Mean error score = 0.56%).

2) Play activity: cognitive game, movement activity, competitive play

2.1) cognitive game: Jigsaw, Puzzle, Maze

Timing errors was the most frequent error (Mean error score = 39.43%) as well as Accuracy errors (Mean error score = 39.24%). This was followed by Omission errors (Mean error score = 4.95%) and Repetition errors (Mean error score = 2.40%).

2.2) movement activity: searching for the treasure on the map, bouncing the ball with two hands in a zigzag manner and throwing the ball into the basket

The most frequent error on movement activity was Accuracy errors (Mean error score = 30.56%). The next most frequent errors type impacting on mastery was Omission errors (Mean error score = 15.22%). This was followed by Repetitive errors (Mean error score = 13.89%) and Time errors (Mean error score = 7.67%).

2.3) competitive play: Domino, Bingo, Stacking

Timing errors was the most frequent error (Mean error score = 11.14%). The next most frequent errors type impacting on mastery was Accuracy errors (Mean error score = 8.19%). This was followed by Omission errors (Mean error score = 6.67%). However, the finding did not meet error in Repetition (Mean error score = 0.00%).

In summary, Accuracy errors, where children in the sample attempted to perform step of task, but performance was incorrect or inaccurate and Timing errors, where step were perform too slow were the most error in all assessment activities.

4.1.5 Research Question 2

'What are information processing strategy application errors found during the performance of Academic and Play activities in Thai children with learning disabilities?'

The detail of mean total scores on each Quadrant of PRPP System: Thai version of each assessment activities are presented as follow:

1) Academic activity: *reading comprehension and Written expression activity*

		in onpross			10.0
PRPP	Min.	Max.	Mean	Mean%	St. Dev.
Quadrant	Score	Score	Score	Score	
Perceive	10.00	25.00	16.53	68.88	13.00
Recall	17.00	24.00	20.40	75.56	2.04
Plan	9.00	23.00	14.40	53.33	5.00
Perform	18.00	23.00	29.43	80.96	1.74

Table 4.4 PRPP Stage Two Quadrant percentage scores of reading

comprehension and written expression activity

Table 4.4 contains the means, standard deviations and mean percentage scores of PRPP Stage Two Quadrant of the reading comprehension and written expression activity. As for the reading comprehension and written expression activity, the Plan Quadrant produced the most problems for children with LD in the sample (Mean 53.33%). The Perceive Quadrant was the next problem to the sample (Mean 68.88%), followed by the Recall Quadrant (Mean 75.56%), and Perform Quadrant(Mean 80.96%).

PRPP Subquadrant	Min.	Max.	Mean	Mean%	St.
6	Score	Score	Score	Score	Dev.
Perceive:	THILL BY				
Attending	5.00	9.00	7.97	88.56	1.43
Sensing	3.00	8.00	5.00	55.56	2.03
Discriminating	2.00	6.00	3.37	56.17	1.43
Recall:	IY A	21	16		
Recalling Facts	3.00	7.00	4.57	50.78	1.36
Recalling Schemes	8.00	9.00	7.65	85.00	0.25
Recalling Procedures	5.00	8.00	6.77	75.22	0.86
Plan:		TERP	·//		
Mapping	3.00	8.00	5.37	59.67	1.83
Programming	3.00	8.00	4.67	51.89	1.84
Evaluating	3.00	7.00	4.37	48.56	1.54
Perform:			080	าเทม	
Initiating	6.00	6.00	6.00	66.67	0.00
Continuing	5.00	8.00	5.93	65.89	1.28
Controlling	7.00	9.00	7.50	83.33	0.57

 Table 4.5 PRPP Stage Two Subquadrant percentage scores of reading comprehension and written expression activity



Figure 4.3 Information processing during reading comprehension and written expression activity

From Table 4.5 and Figure 4.3, it can be seen that Evaluating Subquadrant (Mean 48.56%) was the most problem in Plan Quadrant. Sensing (Mean 55.56%) and Discriminating Subquadrants operation (Mean 56.17%) posed the greatest Perceive Quadrant problems. In the Recall Quadrant operations associated with Recalling Facts Subquadrant (Mean 50.78%) presented the most difficulties. While the Perform Quadrant, Continuing Subquadrant (Mean 65.89%) was the most difficult application in the reading comprehension and written expression activity for these children.

Table 4.6 PRPP Stage Two 'descriptor' percentage scores of reading

comprehension and	written	expression	activity
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Data Code	Descriptor	Min.	Max.	Mean	Mean %	St.
		Score	Score	Score	Score	Dev.
PERCEIVE	ATTENDING					
121102112	Notices	3.00	3.00	3.00	100.00	0.00
	Modulates	1.00	3.00	2.41	80.33	0.73
	Maintains	1.00	3.00	2.72	90.67	0.70
	SENSING					
	Searches	1.00	3.00	1.76	58.67	0.79
	Locates	1.00	3.00	1.76	58.67	0.79
	Monitors	1.00	3.00	1.59	53.00	0.57
	DISCRIMINATING	EL IN	0			
	Discriminates	1.00	3.00	1.76	58.67	0.79
	Matches	1.00	3.00	1.66	55.33	0.67
RECALL	RECALLING FACTS	Sile	- /	. 21	10	
	Recognises	1.00	2.00	1.34	44.67	0.48
	Labels	1.00	2.00	1.38	46.00	0.49
	Categorises	1.00	3.00	1.90	63.33	0.56
	RECALLING SCHEME	and the second s		- T -	11	
	Contextualises to Time	3.00	3.00	3.00	100.00	0.00
	Contextualises to Place	3.00	3.00	3.00	100.00	0.00
	Contextualises to	3.00	3.00	1.65	55.00	0.00
	Duration	NP.		1.		
	RECALLING	CV Z		10	2/1	
	Uses Object	1.00	3.00	2.72	90.67	0.70
	Uses Body	3.00	3 00	3.00	100.00	0.00
	Recalls Steps	1.00	2.00	1.10	36.67	0.30
PLAN	MAPPING	Calco	2	$\circ /$	/	
1 12/11	Knows Goal	1.00	3.00	2.28	76.00	0.75
	Identifies Obstacles	1.00	3.00	1.72	57.00	0.65
	Organises	1.00	2.00	1.45	48.33	0.51
	PROGRAMMING					1.84
0	Chooses	1.00	2.00	1.45	48.33	0.51
	Sequences	1.00	3.00	1.72	57.33	0.75
919	Calibrates	1.00	3.00	1.55	51.67	0.69
C	EVALUATING	hian	r Mai	1 Imin	vorsity	
	Question	1.00	3.00	1.66	55.33	0.67
Δ	Analyses	1.00	2.00	1.38	46.00	0.49
1	Judges	1.00	2.00	1.38	46.00	0.49
PERFORM	INITIATING					
	Starts	3.00	3.00	3.00	100.00	0.00
	Stops	3.00	3.00	3.00	100.00	0.00
	CONTINUING					
	Flows	1.00	2.00	1.38	46.00	0.49
	Continues	1.00	3.00	1.59	53.00	0.82
	Persists	3.00	3.00	3.00	100.00	0.00
	CONTROLLING					
	Times	1.00	3.00	1.55	51.67	0.57
	Coordinates	3.00	3.00	3.00	100.00	0.00
	Adjusts	3.00	3.00	3.00	100.00	0.00

From Table 4.6, the means, standard deviations and range of scores of each 'descriptor' are presented. In reading comprehension and written expression activity, the strategy application behaviours that were the most problematic for children with LD in the sample for each of the Subquadrants mentioned above were *Analyze* (Mean 46.00%) and *Judges* descriptors (Mean 46.00%) (Evaluation Subquadrant), *Monitors* descriptor (Mean 53.00%) (Sensing Subquadrant), *Matches* (Mean 55.33%) and *Discriminates* (Mean 58.67%) descriptors (Discriminating Subquadrant), *Flow* descriptor (Mean 46.00%) (Continuing Subquadrant), and *Recalls Steps* descriptors (Mean 36.67%) (Recalling Subquadrant).

2) Play activity: cognitive game, movement activity, competitive play

2.1) cognitive game: Jigsaw, Puzzle, Maze

Table 4.7 PRPP Stage Two Quadrant percentage scores of cognitive game

		wax.	Wean	Mean%	St. Dev.
Quadrant	Score	Score	Score	Score	~~~~~~
erceive	10.00	24.00	15.10	62.92	3.77
ecall	14.00	24.00	18.73	69.37	3.45
lan	11.00	20.00	13.53	50.11	3.05
erform	15.00	22.00	16.60	69.17	1.90
	Quadrant erceive ecall lan erform	QuadrantScoreerceive10.00.ecall14.00lan11.00erform15.00	Quadrant Score Score erceive 10.00 24.00 ecall 14.00 24.00 lan 11.00 20.00 erform 15.00 22.00	QuadrantScoreScoreScoreerceive10.0024.0015.10.ecall14.0024.0018.73lan11.0020.0013.53erform15.0022.0016.60	QuadrantScoreScoreScoreScoreerceive10.0024.0015.1062.92ecall14.0024.0018.7369.37lan11.0020.0013.5350.11erform15.0022.0016.6069.17

Table 4.7 contains the means, standard deviations and mean percentage scores of PRPP Stage Two Quadrant of the cognitive game. In this activity, the information processing strategies posing most difficulty application for children with LD in the sample were those in the Plan Quadrant (Mean 50.11%). The Perceive Quadrant (Mean 62.92%) was the next difficulty application to the sample, followed by the Perform Quadrant (Mean 69.17%) and Recall Quadrant(Mean 69.37%).

PRPP Subquadrant	Min.	Max.	Mean	Mean%	St.
	Score	Score	Score	Score	Dev.
Perceive					
Attending	5.00	9.00	7.80	86.67	1.49
Sensing	3.00	9.00	4.70	52.22	1.88
Discriminating	2.00	6.00	2.60	43.33	1.07
Recall					
Recalling Facts	3.00	9.00	5.27	58.56	1.84
Recalling Schemes	7.00	9.00	8.00	88.89	0.74
Recalling Procedures	4.00	7.00	5.33	59.22	0.96
Plan	0,00	101	1.8		
Mapping	3.00	7.00	5.57	61.89	0.97
Programming	3.00	6.00	3.70	41.11	0.00
Evaluating	3.00	8.00	4.17	46.33	1.37
Perform	n'a			11	
Initiating	6.00	6.00	6.00	100.00	0.00
Continuing	4.00	8.00	4.73	52.56	1.20
Controlling	5.00	8.00	5.90	65.56	0.84
1 H	1/1		6		

 Table 4.8 PRPP Stage Two Subquadrant percentage scores of cognitive game



Figure 4.4 Information processing during cognitive game

From Table 4.8 and Figure 4.4, it is found that the Plan Quadrant displaying the most difficult application was Programming Subquadrant (Mean 41.11%). Discriminating Subquadrant was the most problem in Perceive Quadrant (Mean 43.33%). In the Perform Quadrant, Continuing Subquadrant (Mean 52.56%) presented the most difficulties. While the Recall Quadrant operations associated with Recalling Facts Subquadrant (Mean 58.56%) was the most difficulty application in cognitive game for these children.



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Data Code	Descriptor	Min.	Max.	Mean	Mean%	St.
	-	Score	Score	Score	Score	Dev.
PERCEIVE	ATTENDING					
	Notices	1.00	3.00	2.55	85.00	0.78
	Modulates	1.00	3.00	2.24	74.67	0.83
	Maintains	3.00	3.00	3.00	100.00	0.00
	SENSING					
	Searches	1.00	3.00	1.52	50.67	0.63
	Locates	1.00	3.00	1.52	50.67	0.63
	Monitors	1.00	3.00	1.72	57.33	0.70
	DISCRIMINATING	0101				
	Discriminates	1.00	3.00	1.31	43.67	0.54
	Matches	1.00	3.00	1.31	43.67	0.54
RECALL	RECALLING FACTS	0.00		2		
	Recognises	1.00	3.00	2.45	81.67	0.91
	Labels	1.00	3.00	1.69	56.33	0.89
	Categorises	1.00	3.00	1.21	40.33	0.49
	RECALLING SCHEME	9)	1	1 -	211	
	Contextualises to Time	3.00	3.00	3.00	100.00	0.00
	Contextualises to Place	3.00	3.00	3.00	100.00	0.00
	Contextualises to Duration	1.00	3.00	2.03	67.67	0.73
	RECALLING	they	1	120	DE I	
	PROCEDURES	Nr w	71		~ //	
	Uses Object	1.00	3.00	1.14	38.00	0.44
	Uses Body	2.00	3.00	2.55	85.00	0.51
	Recalls Steps	1.00	2.00	1.69	56.33	0.47
PLAN	MAPPING	12336	2/	AI		
	Knows Goal	1.00	3.00	2.93	97.67	0.37
	Identifies Obstacles	1.00	2.00	1.41	47.00	0.50
	Organises	1.00	2.00	1.24	41.33	0.44
	PROGRAMMING					
	Chooses	1.00	2.00	1.10	36.67	0.31
8	Sequences	1.00	2.00	1.31	43.67	0.47
	Calibrates	1.00	2.00	1.31	43.67	0.47
	EVALUATING					
C	Question	1.00	3.00	1.21	40.33	0.56
	Analyses	1.00	2.00	1.59	53.00	0.50
A	Judges	\$ 1.00	3.00	1.41	47.00	0.63
PERFORM	INITIATING					
	Starts	3.00	3.00	3.00	100.00	0.00
	Stops	3.00	3.00	3.00	100.00	0.00
	CONTINUING					
	Flows	1.00	2.00	1.17	39.00	0.38
	Continues	1.00	3.00	1.21	40.33	0.49
	Persists	2.00	3.00	2.38	79.33	0.49
	CONTROLLING					
	Times	1.00	2.00	1.17	39.00	0.38
	Coordinates	1.00	3.00	1.76	58.67	0.58
	Adjusts	3.00	3.00	3.00	100.00	0.00

 Table 4.9 PRPP Stage Two 'descriptor' percentages of cognitive game

From Table 4.9, it show that the most difficulty of information processing strategies application for children with LD in the sample were *Chooses* descriptor (Mean 36.67%) (Programming Subquadrant), *Discriminates* (Mean 43.67%) *and Matches* descriptors (Mean 43.67%) (Discriminating Subquadrant), *Flow* (Mean 39.00%) and *Continues* descriptors (40.33%) (Continuing Subquadrant), *Times* descriptors (Mean 39.00%) (Control Subquadrant), and *Recalls Steps* descriptors (Mean 69.17%) (Recalling Subquadrant).

2.2) movement activity: *searching for the treasures on the map, bouncing the ball with two hand in a zigzag manner and throwing the ball into the basket*

Table	4.10	PRPP	Stage	Two	Quadrant	percentage	scores	of
mover	nent a	ctivity	@ _{	AG		582		

PRPP Quadrant	Min.	Max.	Mean	Mean%	St. Dev.
GI	Score	Score	Score	Score	
Perceive	13.00	24.00	20.13	83.88	3.67
Recall	15.00	27.00	22.93	84.93	4.03
Plan	11.00	27.00	20.23	74.93	5.36
Perform	14.00	24.00	19.20	80.00	3.78

Table 4.10 contains the means, standard deviations and mean percentage scores of PRPP Stage Two Quadrant of the movement activity. As for this activity, the Plan Quadrant (Mean 74.93%) illustrated the most problems for the sample group. This was followed by the Perform Quadrant(Mean 80.00%), Perceive Quadrant (Mean 83.88%), and Recall Quadrant (Mean 84.93%).

PRPP Subquadrant	Min.	Max.	Mean	Mean%	St.
	Score	Score	Score	Score	Dev.
Perceive					
Attending	8.00	9.00	8.60	95.56	0.50
Sensing	3.00	9.00	7.03	78.11	1.85
Discriminating	2.00	6.00	4.30	71.67	1.78
Recall					
Recalling Facts	3.00	9.00	7.37	81.89	2.36
Recalling Schemes	9.00	9.00	9.00	100.00	0.00
Recalling Procedures	3.00	9.00	6.60	73.33	2.14
Plan	0,00	5	°4		
Mapping	4.00	9.00	7.27	80.78	1.48
Programming	3.00	9.00	6.10	67.78	2.19
Evaluating	3.00	9.00	6.67	74.11	2.25
Perform	1º2				
Initiating	6.00	6.00	6.00	100.00	0.00
Continuing	5.00	9.00	6.40	71.11	1.75
Controlling	3.00	9.00	6.60	73.33	2.31
1 EI	M/	XA	18		

 Table 4.11 PRPP Stage Two Subquadrant percentage scores of movement

 activity



Figure 4.5 Information processing during movement activity

From Table 4.11 and Figure 4.5, it can be seen that the Plan Quadrant illustrating the most errors was Programming Subquadrant (Mean 67.78%). Continuing Subquadrant showed the most problem in Perform Quadrant (Mean 71.11%). In the Perceive Quadrant, Discriminating Subquadrant (Mean 71.67%) presented the most difficulties. While Recalling Procedures Subquadrant in Recall Quadrant was the next problem on movement activity (Mean 73.33%).



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Data Code	Descriptor	Min.	Max.	Mean	Mean%	St.
		Score	Score	Score	Score	Dev.
PERCEIVE	ATTENDING					
	Notices	3.00	3.00	3.00	100.00	0.00
	Modulates	2.00	3.00	2.60	86.67	0.50
	Maintains	3.00	3.00	3.00	100.00	0.00
	SENSING					
	Searches	1.00	3.00	2.70	90.00	0.65
	Locates	1.00	3.00	2.30	76.67	0.65
	Monitors	1.00	3.00	2.00	66.67	0.91
	DISCRIMINATING	01012				
	Discriminates	1.00	3.00	2.20	73.33	0.92
	Matches	1.00	3.00	2.10	70.00	0.88
RECALL	RECALLING FACTS	S.C.a		4		0.00
	Recognises	1.00	3.00	2.48	82.67	0.83
	Labels	1.00	3.00	2.48	82.67	0.83
	Categorises	1.00	3.00	2.34	78.00	9.94
	RECALLING SCHEME	2.00	2.00	2.00	100.00	0.00
	Contextualises to Time	3.00	3.00	3.00	100.00	0.00
	Contextualises to Place	3.00	3.00	3.00	100.00	0.00
	Contextualises to Duration	3.00	3.00	3.00	100.00	0.00
	PROCEDURES	TH.))			
	Uses Object	1.00	3.00	2.41	80.33	0.87
	Uses Body	1.00	3.00	2.10	70.00	0.90
	Recalls Steps	1.00	3.00	2.00	66.67	0.96
PLAN	MAPPING	La E	2	01		
	Knows Goal	2.00	3.00	2.93	97.67	0.26
	Identifies Obstacles	1.00	3.00	2.38	79.33	0.68
	Organises	1.00	3.00	1.93	64.33	0.80
	PROGRAMMING					
	Chooses	1.00	3.00	2.17	72.33	0.80
	Sequences	1.00	3.00	1.76	58.67	0.87
QIV.	Calibrates	1.00	3.00	2.03	67.67	0.78
Co	EVALUATING	hiang	Mai	Univ	orcity	
	Question	1.00	3.00	2.45	81.67	0.69
	Analyses	1.00	3.00	2.14	71.33	0.74
	Judges	1.00	3.00	-2.21	73.67	0.82
PERFORM	INITIATING	• • • •	• • • •	• • • •	100.00	0.00
	Starts	3.00	3.00	3.00	100.00	0.00
	Stops	3.00	3.00	3.00	100.00	0.00
		1.00	2.00	1 66	55 22	0.06
	FIOWS Continues	1.00	3.00	1.00	55.55 55.22	0.80
	Continues	1.00	3.00	1.00	33.33	0.00
		3.00	3.00	3.00	100.00	0.00
		1.00	2 00	2.02	67 67	0.79
	Coordinatos	1.00	3.00	2.05	01.01 74 67	0.70
	Adjusts	1.00	3.00	2.24 2.24	74.07 74.67	0.91
	1 10/0010	1.00	5.00	<i>∠.∠</i> +	, , .07	0.71

Table 4.12 PRPP Stage Two 'descriptor' percentages of movement activities

Table 4.12 presents the means, standard deviations and range of scores of each 'descriptor' on the movement activity. The strategy application behaviours that were the most problem for children with LD in the sample for each of the Subquadrants mentioned above were *Flows* (Mean 55.33%) and *Continues* descriptors (Mean 55.33%) (Continuing Subquadrant), *Sequences* descriptors (Mean 58.67%) (Programming Subquadrant), *Recalls Steps* descriptors (Mean 66.67%) (Recalling Subquadrant), and *Monitors* descriptor (Mean 66.67%) (Sensing Subquadrant).

2.3) competitive play: Domino, Bingo, Stacking

 Table 4.13 PRPP Stage Two Quadrant percentage scores of competitive play

PRPP	Min.	Max.	Mean	Mean%	St. Dev.
Quadrant	Score	Score	Score	Score	
Perceive	13.00	24.00	21.50	89.58	2.74
Recall	21.00	27.00	25.67	95.07	1.56
Plan	11.00	27.00	24.17	89.52	3.69
Perform	17.00	24.00	21.77	90.17	2.30

Table 4.13 shows that the problems of the information processing strategies application on the competitive play were the less problem than another assessment activity for this sample group with higher mean percentage scores in all quadrants (Mean 89.52-95.07%).

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90

PRPP Subquadrant	Min.	Max.	Mean	Mean%	St.
	Score	Score	Score	Score	Dev.
Perceive					
Attending	6.00	9.00	7.83	87.00	1.34
Sensing	4.00	9.00	7.57	84.11	1.57
Discriminating	3.00	6.00	5.90	98.33	0.55
Recall					
Recalling Facts	6.00	9.00	8.77	97.44	0.63
Recalling Schemes	8.00	9.00	8.67	96.33	0.48
Recalling Procedures	5.00	9.00	8.17	90.78	1.12
Plan	200	0	4		
Mapping	5.00	9.00	8.50	94.44	0.94
Programming	3.00	9.00	7.93	88.11	1.36
Evaluating	3.00	9.00	8.13	90.33	1.57
Perform	Ma			~	
Initiating	6.00	6.00	6.00	100.00	0.00
Continuing	3.00	9.00	7.53	83.67	1.66
Controlling	5.00	9.00	8.23	91.44	0.94
IEI	M	XA	15	° //	

Table 4.14 PRPP Stage Two Subquadrant percentage scores of competitive play



Figure 4.6 Information processing during competitive play

From Table 4.14 and Figure 4.6, it is illustrated that although the total scores of each quadrants on this assessment activity were high. Some Subquadrants were found critical in this sample group involving Sensing (Mean 84.11%) in Perceive Subquadrant and Continuing Subquadrant (Mean 83.67%) in Perform Quadrant.



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Data Code	Descriptor	Min.	Max.	Mean	Mean%	St.
		Score	Score	Score	Score	Dev.
PERCEIVE	ATTENDING					
	Notices	3.00	3.00	3.00	100.00	0.00
	Modulates	2.00	3.00	2.53	84.33	0.51
	Maintains	1.00	3.00	2.30	76.67	0.92
	SENSING					
	Searches	1.00	3.00	2.63	87.67	0.72
	Locates	2.00	3.00	2.77	92.33	0.43
	Monitors	1.00	3.00	2.10	70.00	0.88
	DISCRIMINATING	21216	1			
	Discriminates	2.00	3.00	2.97	99.00	0.18
	Matches	1.00	3.00	2.93	97.67	0.37
RECALL	RECALLING FACTS	10		Sall		
	Recognises	2.00	3.00	2.97	99.00	0.18
	Labels	2.00	3.00	2.93	97.67	0.25
	Categorises	2.00	3.00	2.87	95.67	0.35
	RECALLING SCHEME	4444	1			
	Contextualises to Time	2.00	3.00	2.72	90.67	0.45
	Contextualises to Place	2.00	3.00	2.93	97.67	0.25
	Contextualises to Duration	3.00	3.00	3.00	100.00	0.00
	RECALLING PROCEDURES	V.))	14	. //	
	Uses Object	1.00	3.00	2.77	92.33	0.50
	Uses Body	1.00	3.00	2.83	94.33	0.46
	Recalls Steps	1.00	3.00	2.57	85.67	0.57
PLAN	MAPPING	DECENSION		V //		
	Knows Goal	2.00	3.00	2.93	97.67	0.25
	Identifies Obstacles	2.00	3.00	2.93	97.67	0.25
	Organises	1.00	3.00	2.63	87.67	0.56
	PROGRAMMING					;
0	Chooses	1.00	3.00	2.77	92.33	0.50
	Sequences	1.00	3.00	2.63	87.67	0.56
100	Calibrates	1.00	3.00	2.53	84.33	0.63
Co	EVALUATING	niang	Mai	Unive	ersitv	
	Ouestion	1.00	3.00	2.67	89.00	0.55
A	Analyses	1.00	3.00	2.63	87.67	0.56
	Judges	1.00	3.00	2.62	87.33	0.56
PERFORM	INITIATING					
	Starts	3.00	3.00	3.00	100.00	0.00
	Stops	3.00	3.00	3.00	100.00	0.00
	CONTINUING					
	Flows	1.00	3.00	2.31	77.00	0.66
	Continues	1.00	3.00	2.31	77.00	0.66
	Persists	1.00	3.00	2.86	95.33	0.52
	CONTROLLING					
	Times	1.00	3.00	2.41	80.33	0.57
	Coordinates	1.00	3.00	2.86	95.33	0.52
	Adjusts	1.00	3.00	2.93	97.67	0.37
	-					

Table 4.15 PRPP Stage Two 'descriptor' percentages of competitive play

Table 4.15 presents the means, standard deviations and range of scores of each 'descriptor' are presented in competitive play. The strategy application behaviours that posed the most difficult application for the sample for each of the Subquadrants mentioned above were *Monitor* descriptors (Mean 70.00%) (Sensing Subquadrant), *Flows* (Mean 77.00%) *and Continues* (Mean 77.00%) descriptors (Continuing Subquadrant).

In conclusion, the research study detected a variation of problems to different extent in the four assessment activities on each Quadrant of PRPP System: Thai version. The reading comprehension and written expression activity and the cognitive game were the most novel and complex activities because they required extensive planning and decision making. Total scores of these activities in all quadrants in PRPP System were reported to be relatively lower than other activities, especially in Plan and Perceive Quadrant. Total score in movement activity, as the least complex but high novel, was reported to be lowest in Plan and Perform Quadrant. Total scores in the competitive play were reported to be relatively higher than other activities because the children were familiar with this activity. However, the score of the competitive play was reported to be lowest in Plan and Perceive Quadrant. Summary of finding in Phase One study is presented in Figure 4.7 Copyright[©] by Chiang Mai University Il rights reserved





Figure 4.7 Summary Chart of Finding in Phase One study

4.2 Phase Two: Relationship between information processing strategy during the Academic activity and social competence ability in Thai children with learning disabilities

In phase 2 study with the objective to study the relationship between information processing strategy and social competence ability, the researcher translated the social competence scale (SCS) from the original version to the Thai version by using the back-translation technique and pilot this assessment. After that studying the intra-rater reliability of SCS emerged a complete translated version was conducted. Finally, the researcher studied the relationship between SCS: Thai Version and PRPP System: Thai Version. The procedure of the research methodology included 3 main processes and the presentation of the result was divided into 3 sections.

4.2.1 Section 1: Translating SCS from English Version to Thai Version and pilot use study

In section 1, the result included 4 procedures that were the results from the back translation process and the results of the pilot use process. The details were as follows:

1) Forward translation process

In the translation process of SCS, from original version to Thai version, two translators who were qualified were used for translation. After this process was completed, two professors suggested alternatives and the researcher adjusted for getting the *first draft* of the SCS: Thai Version.

2) Back translation process

In this process the first draft of the SCS Thai Version was translated to the English version by two translators who were qualified and had never seen the SCS original version. After this process was completed, the researcher arrived at the SCS back translation version.

3) Analysis the differences and alterations

In this process the researcher analyzed the differences in content and meaning between the original version and back translation version of SCS. The researcher and two processors conferred together by comparing the differences and alterations. The consideration was conducted sentence by sentence, from the first item to the last item.

In most items, they found that both SCS original and back translations versions were in agreement, in content, but had slight differences in meaning and needed to be adjusted. After the alterations to the differences in meaning of the SCS original version in back translation, the researcher arrived at the *second draft* of SCS: Thai Version. The second draft of the SCS version was trialed with the sample in the next process.

4) Using a complete translated version of SCS to pilot use

The result of using a complete translated version of SCS to pilot use of the SCS: Thai version *second draft*. The SCS: Thai Version was used with five teachers and five parents of five children from the population in Phase 1. The purpose of this process was to find weak points and obstructions that may occur when the researcher use this assessment with this sample. Therefore the researchers altered it before actual use and the results from pilot use found the weak points and the way to rectify it. After alteration of the *second draft* of SCS: Thai Version was completed, the study arrived at the *final draft* of SCS: Thai Version which was put to actual use with the sample children.

4.2.2 Section 2: The study of Intra-rater reliability of SCS: Thai Version

Version	Subtest	T1 M	T1 M	r	p value
		(SD)	(SD)		
Teacher	Prosocial/Communication	18.20	17.50	0.98	< 0.01
		(6.56)	(7.21)		
	Emotion Regulation	17.60	16.70	0.90	< 0.01
		(10.38)	(11.56)		
	Academic Behavior	14.40	14.10	0.98	< 0.01
		(9.40)	(8.94)		
Parent	Prosocial/Communication	14.00	13.40	0.95	< 0.01
		(4.47)	(4.35)	1/1	
	Emotion Regulation	13.70	12.90	0.84	< 0.01
	Q Duy	(2.67)	(2.60)	21	
T		d D			

Table 4.16 Pearson's moment product correlation of SCS: Thai Version for test-retest reliability

Notes: T1 = Time 1, T2 = Time 2, M = mean, SD = standard deviation

Test-retest reliability was conducted on the SCS. Pearson's moment product correlation was used in order to finding r value. This identified the primary test-retest reliability of SCS as excellent, with a high level of correlation between SCS scores for time period one and time period two. The significant correlation found that the r value of three subtests of teacher version were very high which included prosocial/communication skill subtest (r=0.98, p< 0.01), emotion regulation skill subtest (r=0.95, p< 0.01), and academic behavior skill subtest (r=0.98, p< 0.01). Similarly, the r value of the SCS parent version was likewise very high, which included prosocial/communication skill (r=0.95, p< 0.01), and emotion regulation skill subtest (r=0.84, p<0.01). The mean score of SCS: Thai Version which measured in two time period and r value were presented in Table 4.16.

4.2.3 Study the relationship between information processing strategy and social competence ability

Research question 3

'Does information processing strategy during the Academic activity as assessed by the PRPP system: Thai Version relate to the social competence as assessed by the SCS: Thai Version?'

Table 4.17 Demographic characteristics of the children in the sample group (n=30)

Ge	neral data	n=30	Percentage (%)
Candan			
Gender	15.1		
	Male	25	83.33
	Female	5	16.67
Age	9.0 – 9.11	" = h)	3.33
(Years)	10.0 - 10.11	12	40.00
	11.0 - 11.11	11)	36.67
	12.0 - 12.11	6	20.00
Grade	4	10	33.33
	5	1100	36.67
	6	9	30.00

The demographic characteristics of children in the sample group are shown in Table 4.17. Thirty children with LD who met the inclusion criteria were selected to participate in the study. Their average age were 10.8 years old. Most of them were males (83.33%) and were in the 5th grade (36.67%).

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General data		Teachers (n=21)
Gender		
	Male	19
	Female	2
Age		
(Years)	Mean	46
	SD	7.43

Table 4.18 Demographic characteristics of teachers (n=21) in the sample group

The demographic characteristics of teachers in the sample group are shown in Table 4.18. The majority of the teachers were female (n=19), and the mean age of the teachers was 46 years of age (SD = 7.94).

Table 4.19 PRPP Stage Two Quadrant percentage scores of Academic activity

PRP	P Quadrant	Min.	Max.	Mean	Mean	St.
		Score	Score	Score	%	Dev.
	1.01	KY			Score	
Perceive	121	10.00	25.00	16.53	68.88	13.00
Recall	131	17.00	24.00	20.40	75.56	2.04
Plan	1X	9.00	23.00	14.40	53.33	5.00
Perform	CAL	18.00	23.00	29.43	80.96	1.74

Table 4.19 contains the means, standard deviations, and mean percentage scores of PRPP System: Thai Version for Academic task. The results showed that the Plan Quadrant posed the most problems for children with LD in this sample (Mean 53.33%). The Perceive Quadrant was the next most problematic in the sample (Mean 68.88%), followed by the Recall Quadrant (Mean 75.56%), and the Perform Quadrant (Mean 80.96%) being the least problematic.

SCS Subtest	Full	Min.	Max.	Mean	Mean%	St.
	Score	Score	Score	Score	Score	Dev.
Pro- social/Communication	32	6.00	30.00	18.60	58.13	6.25
Emotional Regulation	40	6.00	36.00	20.57	51.43	9.23
Academic Behaviour	28	4.00	24.00	13.67	48.82	6.91

 Table 4.20
 Mean score of Social Competence Scale (Teacher version): Thai

 version

Table 4.20 contains the means, standard deviations, and mean percentage scores of Social Competence Scale (Teacher version): Thai Version. The results showed that Academic Behaviour subtest contained the lowest scores (Mean 48.82%). The Pro-social and Communication Skills subtest showed the highest scores (Mean 58.13%).



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PRPP	SCS Subtest	<i>r</i> value	Level of
Quadrant			correlation
Perceive			
	Pro-social/Communication	.15	low
	Emotional Regulation	.05	no
	Academic Behavior	.87	high
Recall	22181212		
	Pro-social/Communication	.03	no
	Emotional Regulation	.02	no
	Academic Behavior	.67	high
Plan		131	
1 197	Pro-social/Communication	.22	low
1304	Emotional Regulation	.21	low
1385	Academic Behavior	.82	high
Perform			//
12	Pro-social/Communication	.20	low
NE	Emotional Regulation	.27	low
	Academic Behavior	.71	high
orrelation is significa	nt at the 0.05 level (2-tailed)	SY/	

Table 4.21 Pearson's moment product correlation subtests of the SCS: Thai Version and each quadrant of the PRPP System: Thai Version on academic activity

*Correlation is significant at the 0.05 level (2-tailed)

From Table 4.21, it can be seen that there is a correlation between each subtests of the teacher version of SCS: Thai Version and particular quadrants of the PRPP System: Thai Version. High correlation occurred between Academic Behaviour Skill subtest of SCS and Perceive (r = .87), Recall (r = .67), Plan (r =.82), and Perform (r = .71) quadrants. Pro-social/Communication Skill and Emotional Regulation subtests showed no correlation to low correlation with each quadrant of the PRPP System: Thai Version (r = .02-.27).

The relationship between SCS: Thai Version and PRPP System: Thai Version

Only *Academic behaviour Subtest* was high level of correlation with *all quadrants* of PRPP

Figure 4.8 Summary of finding in Phase Two study



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved 4.3 Phase Three: The effect of the combination of the PRPP of intervention and the 4 QM on information processing strategies application during the Academic activity in Thai children with learning disabilities

4.3.1 Research question 4

'How effect is the combination of the PRPP of intervention and the 4 QM on improving application of information processing strategies during the Academic activity of Thai children with learning disabilities?'

The effect of the combination of the PRPP of intervention and the 4 QM on improving application in information processing strategies during the performance of 10 samples in the experimental group and the control group was studied in this phase. The samples in experimental group received the intervention program that combines the PRPP of intervention and the 4QM of facilitated learning twice a week, for 6 weeks. Each treatment section had duration of 50 minutes. On the other hand, the participants in the control group received another alternative intervention less than two session per week. The intervention program has the effect of improving efficiency scores of the PRPP System Stage Two Analysis. This is because the scores of the PRPP System Stage Two Analysis in the baseline assessment help to find problems that can be a guideline to teaching strategies for children and identify the Quadrants and Subquadrants that are critical for the children in the sample group. Therefore the results of Phase three of this study are focused on scores of the PRPP System Stage Two Analysis. The studied results are presented in two parts: the first part is description of demographic characteristics of these sample and the second part shows the findings of analysis from descriptive statistics. It also shows comparison scores of the PRPP system: Thai Version between before and after experiments and between the experimental group and the control group. In order to do this, the researcher used Wilcoxon Sign Rank and Man-Whitney U test.

4.3.2 Demographic Characters of the sample

Demographic	Cont	rol group	Experii	Experimental group	
	n	%	n	%	
Gender					
Male	8	80	8	80	
Female	2	20	2	20	
Age					
10.0 - 10.11	4	40	5	50	
11.0 – 11.11	3	30	5	50	
12.0 - 12.11	312	30	<u> </u>	-	
Grade	110		1		
4	2 0	20	62.4	40	
5	3	30	- 4	40	
6	5	50	2	20	
181	/ (and the	15	1	

Table 4.22 Demographic variables of the control and experimental groups

The demographic characters of the samples are presented in table 4.22. Twenty children with learning disabilities who met in inclusion criteria were asked to participate. In the control group, the average age was 11.33 years. For the experimental group, the average age of the participants was 11.06 years. The majority of the participants in both groups were male.

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4.3.3 The comparison of each Quadrant and Subquadrant of PRPP System: Thai Version scores (Stage Two Analysis) between the Control group and Experimental at Baseline

Mann-Whitney U test was used to compare scores of each Quadrant and Subquadrant of the PRPP System: Thai Version Stage Two Analysis between the control group and the experimental group at baseline and posttest. The results indicated no statistically significant difference in mean percentage scores of all Quadrant and Subquadrant of the PRPP System on the Academic activity (reading comprehension and written expression) between the control group and the experimental group at baseline (see Table 4.23). Table 4.23 The comparison of the PRPP System pre-test scores between the control and experimental group on the Academic activity (reading comprehension and written expression) using the Mann-Whitney U test

PRPP System	Mean Rank		Ζ	Asymp.	Effect		
Quadrant Subquadrant	Control	Experiment		Sig (2-	Size		
	group	group		tailed)	(r)		
	(n=10)	(n=10)					
Perceive:	12.45	8.55	-1.49	.136	.33		
Attending	11.20	9.80	54	.59	.12		
Sensing	12.85	8.15	-1.91	.06	.43		
Discriminating	11.45	9.55	82	.41	.18		
Recall:	12.30	8.70	-1.38	.17	.31		
Recalling Facts	12.75	8.25	-1.84	.07	.41		
Recalling	11.05	9.95	43	.66	.10		
Schemes	1	· Yest	10	5 11			
Recalling	9.10	11.90	-1.14	.25	.26		
Procedures	(Juliu	44 AM	~ \ '				
Plan:	11.50	9.50	77	.44	.17		
Mapping	13.25	7.75	-2.19	.03*	.49		
Programming	11.20	9.80	59	.56	.13		
Evaluating	11.20	9.80	58	.57	.13		
Perform:	11.05	9.95	43	.67	.10		
Initiating	11.75	9.25	-1.10	.27	.25		
Continuing	10.40	10.60	09	.93	.02		
Controlling	10.50	10.50	.00	1.00	.00		
Note. *p<.05.							

From Table 4.23, the Mann-Whitney U test analysis results indicated that the pre-test scores of all Quadrants and Subquadrants showed no significant difference between the control and the experimental group except in the Mapping Subquadrant of the Plan Quadrant (p>.05).

4.3.4 The comparison of PRPP System: Thai Version scores (Stage Two Analysis) between Baseline and Posttest in the Control and Experimental groups

To investigate the effects of the combination of the PRPP of intervention and the 4 QM on improving ability of information processing strategies application on the Academic activity (reading comprehension and written expression). The Wilcoxon Sign Rank test was performed in order to compare the mean score of Quadrant and Subquadrant of PRPP System Stage Two Analysis between baseline and posttest of experiments in the control and experimental groups (see Table 4.24).

Table 4.24 The comparison of the PRPP System pre-test and post-test scores on the Academic activity in the control group and experimental group using the Wilcoxon Signed-Ranks Test

						134C2		
PRPP System		control group			exp	experimental group		
Quadrant	Sub	Ζ	Asymp.	Effect	Z	Asymp.	Effect	
	quadrant		Sig (2-	size (r)	12	Sig (2-	size (r)	
	FI		tailed)	T A	10	tailed)		
Perceive:	IF. I	-1.69 ^b	.09	.38	-2.56ª	.01*	.57	
Attending	g	62 ^b	.54	.14	-1.85 ^a	.07	.41	
Sensing	Il c.	-2.69 ^b	.01*	.60	-2.72ª	.007*	.61	
Discrimin	nating	-1.52 ^b	.13	.34	-1.30 ^a	.19	.29	
Recall:		42 ª	.67	.09	-2.39ª	.02*	.53	
Recalling	g Facts	-1.88 ^b	.06	.42	-2.54ª	.01*	.57	
Recalling	g Schemes	-1.51 ^a	.13	.34	-1.44 ^a	.15	.32	
Recalling Procedur	esight ^C	85ª	.40 Chian	.19 g / a	-2.46 ^b	.01* versity	.55	
Plan:	In 1	-1.18 ^b	.24	.26	-2.50 ^a	.01*	.56	
Mapping		[●] 67 ^b	.51	.15	-2.84 ^a	.004*	.64	
Program	ning	86 ^b	.39	.19	-2.58ª	.01*	.58	
Evaluatin	ıg	-1.67 ^b	.10	.37	-2.51ª	.01*	.56	
Perform:		69 ^b	.50	.15	-2.68ª	.007*	.60	
Initiating		27 ^b	.79	.06	-1.41ª	.16	.32	
Continuii	ng	-1.00 ^b		.22	-2.72 ^a	.007*	.61	
Controlli	ng	45 ^a	.66	.10	-1.60 ^a	.11	.36	

Note. a. Based on negative ranks. b. Based on positive ranks. *p < .05.

From Table 4.24, the statistical analysis from the Wilcoxon Signed-rank test indicated that the pre-test and post-test scores of all Quadrant and Sub-quadrant (except the Sensing Sub-quadrant in the Perceive Quadrant) demonstrated no significant difference (p > .05) on the Academic activity (reading comprehension and written expression).

4.3.5 The comparison of each Quadrant and Subquadrant of PRPP System: Thai Version scores (Stage Two Analysis) between the Control group and Experimental at Posttest

After receiving the program, there was a statistically significant difference in mean percentage scores of some Quadrant and Subquadrant of the PRPP System on the Academic activity between the control group and the experimental group at posttest (see Table 4.25).

Table 4.25 The comparison of the PRPP System post-test scores between the control and experimental group on the Academic activity (reading comprehension and written expression) using the Mann-Whitney U test

PRPP System		Mean Rank		Z	Asymp.	Effect
Quadrar	nt Subquadrant	Control	Experiment	A 11	Sig (2-	Size
	N.C.	group	group	N//	tailed)	(<i>r</i>)
		(n=10)	(n=10)	1		
Perceive	: 11 M	15.50	5.50	-3.80	.000**	.85
	Attending	13.40	7.60	-2.24	.03*	.50
	Sensing	15.50	5.50	-3.93	.000**	.88
	Discriminating	12.65	8.35	-1.85	.06	.41
Recall	GIIIOBIII	10.25	10.75	19	.85	.04
Co	Recalling Facts	13.65	7.35	-2.46	.01*	.55
	Recalling Schemes	9.55	11.45	75	.46	.17
AI	Recalling	7.70	13.30	e-2.22	.03*	.50
	Procedures					
Plan		14.75	6.25	-3.24	.001*	.72
	Mapping	14.50	6.50	-3.09	.002*	.69
	Programming	14.50	6.50	-3.47	.000**	.78
	Evaluating	14.80	6.20	-3.39	.000**	.76
Perform		14.75	6.25	-3.26	.001*	.73
	Initiating	10.50	10.50	.000	1.00	.00
	Continuing	15.40	5.60	-3.93	.000**	.88
	Controlling	12.50	8.50	-1.62	.11	.36
T . slesle /	0.01 # 0.5					

Note. **p<.001. *p<.05.

Form Table 4.25, the analysis results from the Mann-Whitney U test indicated that the scores of the Perceive, Plan and Perform Quadrants showed a significant difference between the control and the experimental group at post-test (p<.05, p<.001). The Recall Quadrant showed no significant difference (p>0.5). However, there were two Sub-quadrants in the Recall Quadrant (Recalling Facts and Recalling Procedures) that demonstrated a significant difference between the two groups (p<.05).



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Figure 4.9 Summary Chart of Finding in Phase Three study