CHAPTER FOUR

RESULTS AND FINDINGS

This chapter aims to present the results of the statistics as processed by SPSS software. Along with a table, there will be a written explanation for each item described in the recall tests. Ultimately, the final part summarizes the findings concerning each approach.

4.1 Results

First, this study performs the Levene's test of homogeneity on the following groups prior to the execution of One-Way ANOVA (Analysis of Variance) to ensure the equality of the means of their pretests. In Table 1, the means and standard variations of the pretests among the three groups are almost the same, with 23.296 and 5.511 in the definition-based group, 23.560 and 5.568 in the non-iconic morphological group, and 25.615 and 5.378 in the iconic-morphological group. The result of the Levene's test ($F = .137$, $p = .872 > .05$ in Table 1.1) shows that the homogeneity of variance of the pretests is not significant. On the other hand, the result of the ANOVA test ($F = 1.805$, $p = .171 > .05$ in Table 1.2) indicates that the pre-tests among the three groups can be regarded equal. That is, the three groups can be compared with one another after receiving instructions using different vocabulary teaching methods because of their approximately equal vocabulary size.

Table 1 Means of Pretest among Three Groups

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
pretest	Definition	27	23.296	5.511	1.061	21.116	25.476
	Non-iconic	25	23.560	5.568	1.114	21.262	25.859
	Iconic	39	25.615	5.378	0.861	23.872	27.359
	Total	91	24.363	5.519	0.579	23.213	25.512

Table 1.1 Homogeneity of Pretest

	Levene Statistic	df1	df2	Sig.
pretest	.137	2	88	.872

Tabel 1.2 ANOVA of Pretest among Three Groups

		Sum of Squares	df	Mean Square	F	Sig.
pretest	Between Groups	108.013	2	54.006	1.805	.171
	Within Groups	2633.02	88	29.921		
	Total	2741.03	90			

Second, the subjects in the iconic-morphological group are classified into three levels. Owing to normal and close frequencies of the scores of pretests (in Table 2) as well as the almost equivalence of the mean (25.6154) and the median (25.0000) (in Table 2.1), each thirty-three percent of the subjects are divided into three different levels (i.e., low, intermediate, and advanced levels) to explore the variance of each level in each post-test. Thus, there are 14, 13, 12 subjects at the low level, the intermediate level, and the advanced level, respectively.

As shown in Table 2.2, the means and standard deviations of the three levels in each post-test appear quite close. Moreover, in Table 2.3 the ANOVA test is utilized

for examining the difference of the three levels. The results (post-test 1 (F = .882, p

= .423 > .05); post-test 2 (F = .761, p = .475 > .05); post-test 3 (F = 1.676, p = .201

> .05); post-test 4 (F = .623, p = .542 > .05)) apparently indicate no significant

difference among the three levels of the iconic-morphological group in each post-test.

That is, awareness of morphology (i.e., post-test 1), short-term memory for words (i.e.,

post-test 2), and long-term memory for words (i.e., post-test 3 and post-test 4) of the

subjects at different levels in the iconic-morphological group show no significant

difference. Therefore, the following individual word analysis is not involved with the

variance of different levels of different groups, but merely refers to the comparison of

the three groups.

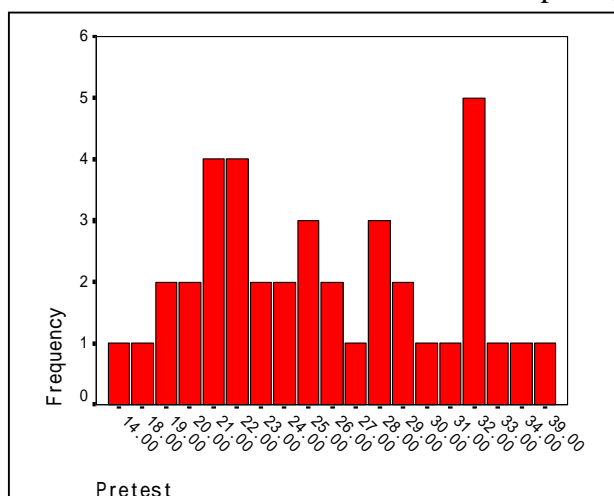Table 2 Bar Charts of Pretest in Iconic-morphological Group

Table 2.1 Three Levels of Pretest in Icoinic-morphological Group

N	Valid	39
Mean		25.6154
Median		25.0000
Percentiles	33	22.0000
	66	28.0000
	99	39.0000

Table 2.2 Means of Three Levels in Iconic-morphological Group

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
pretest	1	14	20.143	2.179	0.582	18.885	21.401
	2	13	25.539	1.808	0.502	24.446	26.631
	3	12	32.083	2.644	0.763	30.403	33.764
posttest1	1	14	29.357	1.277	0.341	28.620	30.095
	2	13	29.769	0.599	0.166	29.407	30.131
	3	12	29.750	0.622	0.179	29.355	30.145
posttest2	1	14	27.786	3.017	0.806	26.044	29.528
	2	13	27.692	3.326	0.923	25.682	29.702
	3	12	29.000	2.374	0.685	27.492	30.508
posttest3	1	14	16.714	4.214	1.126	14.281	19.147
	2	13	18.769	4.106	1.139	16.288	21.250
	3	12	19.750	4.731	1.366	16.744	22.756
posttest4	1	14	15.286	4.984	1.332	12.408	18.163
	2	12	15.833	4.324	1.248	13.086	18.581
	3	11	17.455	5.466	1.648	13.783	21.126

Table 2.3 ANOVA in Iconic-morphological Group

		Sum of Squares	df	Mean Square	F	Sig.
posttest1	Between Groups	1.459	2	0.729	0.882	.423
	Within Groups	29.772	36	0.827		
posttest2	Between Groups	13.233	2	6.616	0.761	.475
	Within Groups	313.126	36	8.698		
posttest3	Between Groups	63.252	2	31.626	1.676	.201
	Within Groups	679.415	36	18.873		
posttest4	Between Groups	30.316	2	15.158	0.623	.542
	Within Groups	827.251	34	24.331		

Third, the results of the ANOVA test in Table 3 indicate the differences of

post-test 1 (i.e., the test of awareness of morphology), post-test 2 (i.e., the test of

short-term memory for words), post-test 3 (i.e., the test of one-week long-term

memory for words), and post-test 4 (i.e., the test of one-month long-term memory for words) among the three groups. In addition, with the comparison of the means among the post-tests of different groups in Table 3.1, this study highlights the importance of the iconic-morphological approach via commonly-used roots.

In post-test 1, based on the ANOVA test (F = 11.505, p = .000 < .05) in Table 3, the variance of each group is statistically significant. Moreover, in Table 3.1, the mean and the standard deviation of each group are significantly different, with 24.444 and 6.681 in the definition-based group, 27.080 and 4.339 in the non-iconic morphological group, and 29.615 and 0.907 in the iconic-morphological group. That is, those who receive instruction in the iconic-morphological approach via commonly-used roots develop higher awareness of morphology than those who receive instruction in the definition-based teaching method or in the non-iconic morphological approach via commonly-used roots. Apparently, the subjects in the definition-based group display the lowest awareness of morphology.

In post-test 2, from the result of the ANOVA test (F = 14.931, p = .000 < .05) in Table 3, one can see that the variance of each group is statistically significant. Additionally, the mean and the standard deviation of each group are significantly different, with 23.148 and 5.482 in the definition-based group, 25.120 and 2.128 in the non-iconic morphological group, and 28.128 and 2.931 in the iconic-morphological group. This means that those who receive instruction in the iconic-morphological approach via commonly-used roots have better short-term memory for words than those who receive instruction in the definition-based teaching method or in the non-iconic morphological approach via commonly-used roots. Apparently, the subjects in the definition-based group have the worst short-term memory for words.

In post-test 3, the result of the ANOVA test (F = 10.408, p = .000 < .05) in Table 3 shows statistical differences between each group. Furthermore, the mean and the standard deviation of each group are significantly different, with 13.296 and 4.131 for the definition-based group, 15.840 and 4.741 for the non-iconic morphological group, and 18.333 and 4.421 for the iconic-morphological group. That is, those who receive instruction in the iconic-morphological approach via commonly-used roots have better one-week long-term memory for words than those who receive instruction in the definition-based teaching method or in the non-iconic morphological approach via commonly-used roots. Apparently, the subjects in the definition-based group perform the worst in terms of one-week long-term memory for words.

In post-test 4, the result of the ANOVA test (F = 11.356, p = .000 < .05) in Table 3 indicates that the variance of each group is statistically significant. Furthermore, the mean and the standard deviation of each group are significantly different, with 10.333 and 4.123 for the definition-based group, 13.160 and 5.359 for the non-iconic morphological group, and 16.108 and 4.881 for the iconic-morphological group. In other words, those who receive instruction in the iconic-morphological approach via commonly-used roots will have better one-month long-term memory for words than those who receive instruction in the definition-based teaching method or in the non-iconic morphological approach via commonly-used roots. Explicitly, the subjects in the definition-based group have the worst long-term memory for words.

In summary, the ANOVA test and the comparison of their means and standard deviations can indicate the difference of each group in each test. Statistically compared, those who receive instruction in the iconic-morphological approach via commonly-used roots outperform those who receive instruction in the

definition-based teaching method or in the non-iconic morphological approach via commonly-used roots in terms of awareness of morphology, short-term memory for words, and long-term memory for words; the definition-based group apparently performs the worst in each post-test.

Table 3 ANOVA in the Three Groups

		Sum of Squares	df	Mean Square	F	Sig.
posttest1	Between Groups	429.801	2	214.901	11.505	.000
	Within Groups	1643.74	88	18.679		
posttest2	Between Groups	412.78	2	206.39	14.931	.000
	Within Groups	1216.41	88	13.823		
posttest3	Between Groups	408.19	2	204.095	10.408	.000
	Within Groups	1725.66	88	19.61		
posttest4	Between Groups	525.252	2	262.626	11.356	.000
	Within Groups	1988.93	86	23.127		

Table 3.1 Means of Three Groups in Each Posttest

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for	
						Lower Bound	Upper Bound
posttest1	Definition	27	24.444	6.681	1.286	21.801	27.088
	Non-iconic	25	27.080	4.339	0.868	25.289	28.871
	Iconic	39	29.615	0.907	0.145	29.322	29.909
posttest2	Definition	27	23.148	5.482	1.055	20.980	25.317
	Non-iconic	25	25.120	2.128	0.426	24.242	25.998
	Iconic	39	28.128	2.931	0.469	27.178	29.078
posttest3	Definition	27	13.296	4.131	0.795	11.662	14.930
	Non-iconic	25	15.840	4.741	0.948	13.883	17.797
	Iconic	39	18.333	4.421	0.708	16.900	19.766
posttest4	Definition	27	10.333	4.123	0.794	8.702	11.964
	Non-iconic	25	13.160	5.359	1.072	10.948	15.372
	Iconic	37	16.108	4.881	0.802	14.481	17.735

Table 3.2 Independent T-test of Definition-based and Non-iconic Method

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
							Lower	Upper
posttest1	Equal variances assumed	3.365	.073	-1.672	50	.101	-5.802	0.5304
	Equal variances not assumed			-1.699	44.971	.096	-5.76	0.4889
posttest2	Equal variances assumed	16.977	.000	-1.684	50	.098	-4.324	0.3802
	Equal variances not assumed			-1.733	34.167	.092	-4.283	0.3397
posttest3	Equal variances assumed	0.557	.459	-2.067	50	.044	-5.016	-0.07
	Equal variances not assumed			-2.056	47.799	.045	-5.032	-0.06
posttest4	Equal variances assumed	2.014	.162	-2.141	50	.037	-5.479	-0.175
	Equal variances not assumed			-2.12	45.029	.04	-5.513	-0.141

As for the comparison between the definition-based group and the non-iconic morphological group, the results of the Independent T-test of each post-test in Table 3.2 (t = -1.672, p = .101 > .05 in post-test 1; t = -1.733, p = .092 > .05 in post-test 2; t = -2.067, p = .044 < .05 in post-test 3; t = -2.141, p = .037 < .05 in post-test 4) indicate no significant difference in awareness of morphology (i.e., post-test 1) and short-term memory for words (i.e., post-test 2) between the two groups, but

significant difference in long-term memory for words (i.e., post-test 3 and post-test 4). That is, those who receive instruction in the non-iconic morphological approach via commonly-used roots have better long-term memory for words than those who receive instruction in the definition-based method. Nonetheless, there is no significant difference in their awareness of morphology and their short-term memory for words between the two groups.

Fourth, Table 4 indicates the significant effects of the iconic-morphological approach via commonly-used roots on the correct spelling and the similar spelling in both post-test 3 and post-test 4.[1] According to the ANOVA test of the three groups, the differences of correct spelling (F = 7.374, p = .001 < .05) and similar spelling (F = 10.56, p = .000 < .05) in post-test 3 are significant. Moreover, in Table 4.1 the means of correct spelling and similar spelling in post-test 3 are quite different, with 2.519 and 0.556 in the definition-based group, 4.880 and 0.760 in the non-iconic morphological group, and 5.308 and 1.846 in the iconic-morphological group.

As for post-test 4, there exist similar phenomena of correct spelling and similar spelling to those in post-test 3. The correct spelling (F = 15.32, p = .000 < .05) and similar spelling (F = 4.568, p = .013 < .05) indicate significant difference among the three groups. Furthermore, in Table 4.1 the means of correct spelling and similar spelling in post-test 4 are significantly different, with 0.519 and 0.593 in the definition-based group, 3.480 and 0.760 in the non-iconic morphological group, and 3.973 and 1.162 in the iconic-morphological group.

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[1] Some students cannot spell a word because they have never encounter the word or they are not familiar with its spelling, but know its meaning. That is, failing to spell the word correctly does not mean that he or she does not know the meaning of the word. Thus, correct spelling and similar spelling should be compared in this study.

On the basis of the statistics of correct spelling and similar spelling in post-test 3 and post-test 4, those who receive the iconic-morphological approach via commonly-used roots can be found to own better correct spelling ability and similar spelling ability than those who receive the other two teaching methods. Statistically speaking, the subjects who learn the definition-based method perform worst of the three groups in both correct spelling ability and similar spelling ability.

Table 4 ANOVA of Spelling and Similar Spelling in Three Groups

		Sum of Squares	df	Mean Square	F	Sig.
Posttest3 correct spelling	Between Groups	133.35	2	66.672	7.374	.001
	Within Groups	795.69	88	9.042		
	Total	929.03	90			
Posttest3 similar spelling	Between Groups	32.224	2	16.112	10.56	.000
	Within Groups	134.3	88	1.526		
	Total	166.53	90			
Posttest4 correct spelling	Between Groups	202.99	2	101.5	15.32	.000
	Within Groups	569.95	86	6.627		
	Total	772.94	88			
Posttest4 similar spelling	Between Groups	5.535	2	2.767	4.568	.013
	Within Groups	52.106	86	0.606		
	Total	57.64	88			

Table 4.1 Means of Spelling and Similar Spelling in Three Groups

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for	
						Lower Bound	Upper Bound
Posttest3 correct spelling	1	27	2.519	1.889	0.364	1.771	3.266
	2	25	4.880	3.444	0.689	3.459	6.302
	3	39	5.308	3.318	0.531	4.232	6.383
	Total	91	4.363	3.213	0.337	3.694	5.032
Posttest3 similar spelling	1	27	0.556	0.698	0.134	0.279	0.832
	2	25	0.760	0.926	0.185	0.378	1.142
	3	39	1.846	1.631	0.261	1.318	2.375
	Total	91	1.165	1.360	0.143	0.882	1.448
Posttest4 correct spelling	1	27	0.519	0.700	0.135	0.242	0.795
	2	25	3.480	3.084	0.617	2.207	4.753
	3	37	3.973	3.023	0.497	2.965	4.981
	Total	89	2.787	2.964	0.314	2.162	3.411
Posttest4 similar spelling	1	27	0.593	0.747	0.144	0.297	0.888
	2	25	0.760	0.523	0.105	0.544	0.976
	3	37	1.162	0.928	0.153	0.853	1.472
	Total	89	0.876	0.809	0.086	0.706	1.047

Fifth, Table 5 presents the correlations of pre-test (their English vocabulary size), post-test 1 (their awareness of morphology), post-test 2 (their short-term memory for words), post-test 3 (their one-week long-term memory for words), and post-test 4 (their one-month long-term memory for words) of the traditional definition-based group. The following paragraphs indicate the results and the references of the correlations between the tests taken by the subjects.

(1) According to the statistics of pre-test and post-test 1 in Table 5, their Pearson's correlation (Pearson = .472, p = .013 < .05) is significant. That is, the subjects' vocabulary size (i.e., pre-test) is correlated with their awareness of morphology (i.e., post-test 1). In other words, after receiving the definition-based teaching method, the subjects with larger vocabulary size display higher awareness of morphology, and vice versa.

(2) The correlation of pre-test and post-test 3 (Pearson = .427, p = .026 < .05) or that of pre-test and post-test 4 (Pearson = .551, p = .003 < .05) is statistically significant. That is, the English vocabulary size is correlated with the long-term memory for words. Thus, it is inferred that after receiving instruction in the definition-based teaching method, subjects with larger vocabulary size have better long-term memory, and vice versa.

(3) However, based on the statistics of pre-test and post-test 2, the Pearson's correlation (Pearson = .295, p = .135 > .05) is not statistically significant. This indicates that the subjects' English vocabulary size is not correlated with the short-term memory for words. In other words, subjects in this group can learn words by rote for a short period of time regardless of their English vocabulary size.

(4) The correlation of post-test 1 and post-test 2 (Pearson = .647, p. 000 < .05) is statistically significant. This means that their awareness of morphology is correlated with their short-term memory for words. This means that in the definition-based group those who have higher awareness of morphology have better short-term memory for words, and vice versa.

(5) The correlation of post-test 1 and post-test 3 (Pearson = .530, p = .004 < .05) or that of post-test 1 and post-test 4 (Pearson = .398, p = .04 < .05) is significant. The statistics show that the subjects' awareness of morphology is correlated with their long-term memory for words. In other words, after receiving instruction in the definition-based teaching method, those who have higher awareness of morphology have better long-term memory for words, and vice versa.

(6) Then, the correlation of post-test 2 and post-test 3 (Pearson = .598, p = .001 < .05) or that of post-test 2 and post-test 4 (Pearson = .466, p = .014 < .05) is still significant. It is thus inferred that their short-term memory for words is correlated

with their long-term memory for words. That is, after receiving instruction in the definition-based teaching method, those who have better short-term memory for words have better long-term memory for words, and vice versa.

(7) Finally, the correlation of post-test 3 and post-test 4 (Pearson = .845, p = .000 < .05) is significant. This indicates that one-week long-term memory for words is highly correlated with one-month long-term memory for words. This means that after receiving instruction in the definition-based teaching method those who have better one-month long-term memory for words have better one-week long-term memory for words, and vice versa.

Table 5 Correlations in Definition-based Group

		Pretest	posttest1	posttest2	posttest3	posttest4
Pretest	Pearson Correlation	1				
	Sig. (2-tailed)	.				
	N	27				
Posttest1	Pearson Correlation	.472(*)	1			
	Sig. (2-tailed)	.013	.			
	N	27	27			
Posttest2	Pearson Correlation	.295	.647(**)	1		
	Sig. (2-tailed)	.135	.000	.		
	N	27	27	27		
Posttest3	Pearson Correlation	.427(*)	.530(**)	.598(**)	1	
	Sig. (2-tailed)	.026	.004	.001	.	
	N	27	27	27	27	
Posttest4	Pearson Correlation	.551(**)	.398(*)	.466(*)	.845(**)	1
	Sig. (2-tailed)	.003	.04	.014	.000	.
	N	27	27	27	27	27
* Correlation is significant at the .05 level (2-tailed).						
** Correlation is significant at the .01 level (2-tailed).						

Sixth, Table 6 presents the correlations of pre-test, post-test 1, post-test 2, post-test 3, and post-test 4 of the non-iconic morphological group. The following paragraphs indicate the results and the references of the correlations between the tests taken by the subjects.

(1) The correlation of pre-test and post-test 2 (Pearson = .293, p = .155 > .05) is not statistically significant. This indicates that in the non-iconic morphological group the subjects' English vocabulary size is not correlated with their short-term memory for words. In other words, the subjects in this group can learn words by rote for a short period of time regardless of their English vocabulary size.

(2) The correlation of pre-test and post-test 3 (Pearson = .423, p = .035 < .05) or that of pre-test and post-test 4 (Pearson = .479, p = .016 < .05) is statistically significant. The results indicate that the subjects' English vocabulary size is correlated with their long-term memory for words. This means that in the non-iconic morphological group, subjects with larger vocabulary size have better long-term memory for words, and vice versa.

(3) The correlation of post-test 1 and post-test 3 (Pearson = .446, p = .025 < .05) or that of post-test 1 and post-test 4 (Pearson = .499, p = .011 < .05) is significant. The statistics show that the subjects' awareness of morphology is correlated with their long-term memory for words. In other words, after receiving instruction in the non-iconic morphological approach via commonly-used roots, those who display increased awareness of morphology have better long-term memory for words, and vice versa.

(4) Then, the correlation of post-test 2 and post-test 3 (Pearson = .423, p = .035 < .05) or that of post-test 2 and post-test 4 (Pearson = .579, p = .002 < .05) is also significant. This can be seen from the fact that in the non-iconic morphological group

their short-term memory for words is correlated with their long-term memory for words. That is, those who have better short-term memory for words have better long-term memory for words, and vice versa.

(5) Finally, the correlation of post-test 3 and post-test 4 (Pearson = .757, p = .000 < .05) is significant. This shows that one-week long-term memory for words is highly correlated with one-month long-term memory for words. In other words, in the non-iconic morphological group those who have better one-month long-term memory for words definitely have better one-week long-term memory for words, and vice versa.

Table 6 Correlations in Non-iconic Morphological Group

		Pretest	Posttest1	Posttest2	Posttest3	Posttest4
Pretest	Pearson Correlation	1				
	Sig. (2-tailed)	.				
	N	25				
Posttest1	Pearson Correlation	0.231	1			
	Sig. (2-tailed)	.267	.			
	N	25	25			
Posttest2	Pearson Correlation	0.293	0.211	1		
	Sig. (2-tailed)	.155	.311	.		
	N	25	25	25		
Posttest3	Pearson Correlation	.423(*)	.446(*)	.423(*)	1	
	Sig. (2-tailed)	.035	.025	.035	.	
	N	25	25	25	25	
Posttest4	Pearson Correlation	.479(*)	.499(*)	.579(**)	.757(**)	1
	Sig. (2-tailed)	.016	.011	.002	.000	.
	N	25	25	25	25	25
* Correlation is significant at the 0.05 level (2-tailed).						
** Correlation is significant at the 0.01 level (2-tailed).						

Seventh, Table 7 indicates the correlations of pre-test, post-test 1, post-test 2, post-test 3, and post-test 4 of the iconic-morphological group. Then the following paragraphs indicate the results and the references of the correlations between the tests taken by the subjects.

(1) The correlation of pre-test and post-test 2 (Pearson = .143, p = .384 > .05) is not statistically significant. This means that the subjects' English vocabulary size is not correlated with their short-term memory for words. In other words, the subjects in the iconic-morphological group can learn words by rote for a short period of time regardless of their English vocabulary size.

(2) The correlation of pre-test and post-test 3 (Pearson = .330, p = .04 < .05) is statistically significant. The result indicates that their English vocabulary size is correlated with their one-week long-term memory for words. Thus, it is inferred that subjects with larger vocabulary size have better long-term memory for words, and vice versa in the iconic-morphological group. However, the correlation of their pre-test and post-test 4 (Pearson = .278, p = .096 >.05) is not statistically significant. This means that in this group, the subjects with larger vocabulary size do not necessarily have one-month long-term memory, and vice versa.

(3) Based on the statistics of post-test 1 and post-test 2, their correlation (Pearson = .584, p = .000 < .05) is significant. The result infers that their awareness of morphology is correlated with their short-term memory for words. That is, after receiving instruction in the iconic-morphological approach via commonly-used roots, those who display increased awareness of morphology have better short-term memory for words, and vice versa.

(4) The correlation of post-test 1 and post-test 3 (Pearson = .492, p = .001 < .05) or that of post-test 1 and post-test 4 (Pearson = .458, p = .004 < .05) is significant. The

statistics show that awareness of morphology can be correlated with long-term memory for words. In other words, after receiving instruction in the iconic-morphological approach via commonly-used roots, those who display increased awareness of morphology have better long-term memory for words, and vice versa.

(5) Then, the correlation of post-test 2 and post-test 3 (Pearson = .584, p = .000 < .05) or that of post-test 2 and post-test 4 (Pearson = .629, p = .000 < .05) is still significant. This means that the subjects' short-term memory for words can be correlated with their long-term memory for words. That is, after receiving instruction in the iconic-morphological approach via commonly-used roots, those who have better short-term memory for words have better long-term memory for words, and vice versa.

(6) Finally, the correlation of post-test 3 and post-test 4 (Pearson = .853, p = .000 < .05) is significant. This indicates that one-week long-term memory is highly correlated with one-month long-term memory. In other words, in the iconic-morphological group those who have better one-week long-term memory for words definitely have better one-month long-term memory for words, and vice versa.

Table 7 Correlations in Iconic-morphological Group

		Pretest	Posttest1	Posttest2	Posttest3	Posttest4
Pretest	Pearson Correlation	1				
	Sig. (2-tailed)	.				
	N	39				
Posttest1	Pearson Correlation	.179	1			
	Sig. (2-tailed)	.275	.			
	N	39	39			
Posttest2	Pearson Correlation	.143	.584(**)	1		
	Sig. (2-tailed)	.384	.000	.		
	N	39	39	39		
Posttest3	Pearson Correlation	.330(*)	.492(**)	.584(**)	1	
	Sig. (2-tailed)	.04	.001	.000	.	
	N	39	39	39	39	
Posttest4	Pearson Correlation	.278	.458(**)	.629(**)	.853(**)	1
	Sig. (2-tailed)	.096	.004	.000	.000	.
	N	37	37	37	37	37
* Correlation is significant at the .05 level (2-tailed).						
** Correlation is significant at the .01 level (2-tailed).						

4.2 Findings

This section summarizes the main findings pertinent to the proposed research

questions in Chapter One as follows:

(1) Students who are taught the iconic-morphological approach via

commonly-used roots develop higher awareness of morphology, better

short-term memory for words, better long-term memory for words, better

spelling and similar spelling abilities than those who are taught the

definition-based approach or the non-iconic morphological approach via

commonly-used roots. Besides, the students in the iconic-morphological

group can also memorize more unfamiliar words by taking better advantage

of the similar spelling.

(2) Among the three groups, those who display higher awareness of morphology have better short-term memory for words, and vice versa.

(3) Among the three groups, those who display higher awareness of morphology have better long-term memory for words, and vice versa.

(4) Among the three groups, those who have better short-term memory for words have better long-term memory for words, and vice versa.

(5) Among the three groups, those who have better one-week long-term memory for words definitely have better one-month long-term memory for words, and vice versa.

(6) Among the three groups, the subjects can learn words by rote for a short period of time regardless of their vocabulary size. That is, there is no significant difference in the short-term memory of the subjects at the different levels.

(7) In the definition-based group, the subjects with larger vocabulary size have higher awareness of morphology. Nonetheless, the phenomenon does not occur in the non-iconic morphological group or in the iconic-morphological group. That is, those who receive instruction in the morphological approach with or without the aids of icons can improve their morphological knowledge regardless of their vocabulary size. Consequently, there is no significantly different awareness of morphology among the subjects that receive instruction in the morphological approach.

(8) In the definition-based group or in the non-iconic morphological group, the subjects with larger vocabulary size possess better long-term memory for words than those with smaller vocabulary size. However, in the

iconic-morphological group, the phenomenon is not so apparent in the

one-month test. This means that icons indeed benefit the subjects'

one-month long-term memory for words.