

## CHAPTER 3

### METHODOLOGY

This chapter is comprised of four sections. Section one describes the research design, including the pilot study and the formal study. Section two illustrates subjects and the sampling techniques. Section three introduces materials employed at each step. The final section outlines the statistical treatment for the research.

#### Research Design

This research design is documented in two parts: a pilot study and a formal study. Based on the feedback from the pilot study, the formal study has made some revision to make it more practical for the research. Both of them are written in detail as follows.

#### The Pilot Study

There were two purposes for conducting the pilot study. First, the focus of the pilot study was to evaluate the feasibility of a syllable-awareness based phonics instruction, such as the instruction time, the content of the instruction and the activities. In addition, the researcher wanted to examine the effects of the instruction on the learners in spelling multi-syllable words, and their learning attitudes.

The pilot study used a pre-experimental, one-group pretest-posttest design from February to May in 2008. Seventeen subjects were selected from a class of 7th graders in a public school in Keelung. They all filled out the pre-instruction questionnaire on learning, and took the syllable counting test. The questionnaire and the test were designed to ensure the homogeneity among subjects --- namely, all of them (1) did not join cram schools and (2) did not have clear concept of syllables

(shown by their failing grades of syllable counting test : under 50). Then, the 17 subjects took a multi-syllable word pretest to assess their beginning level of spelling. In the pilot study of 13 weeks, subjects<sup>1</sup> had a 10-minute class once a week about syllable-awareness based phonics instruction. Because of the subjects' unwillingness to have extra classes, the instruction was thus designed to be part of the regular class instead of an independent remedial class. The 10-minute class was conducted at the end of the 8<sup>th</sup> class every Monday. After the 13-week instruction, the subjects took a multi-syllable word posttest which was the same as the pretest (see Appendix A), and filled out a post-instruction questionnaire on learning. Finally, the researcher interviewed some poor performers to get more feedback about the instruction.

The result of the pilot study showed subjects' progress on spelling ability as well as their attitudes toward learning English.

Overall, the result of the spelling test was positive. In this small scaled pilot study, the data collected from the word spelling test on the 17 subjects was analyzed in a descriptive way instead of using t-tests. Table 3.1 listed the descriptive statistics of the multi-syllable word pretest and posttest. The total improvements of the spelling test were 57 points. Most subjects made some progress on the spelling test, but three subjects regressed and four subjects had no change. According to the interviews and researcher's classroom observation, the poor performance might be related to the bad classroom order and the tiredness of the long test. Furthermore, some subjects suggested that more exercises could be added for a better performance.

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<sup>1</sup> In order to avoid informing them as selected subjects or underachievers, the 17 subjects took the instruction with other 20 students who did not match the condition for the study. According to the researcher's observation, students did not share their skills of applying phonics or syllables with one another in or after class. Thus, it will not lead to unjustified results in this pilot study.

Table 3.1 Descriptive Statistics on Multi-syllable Word Spelling Pretest and Posttest

Ss	Sex	Multi-syllable word spelling pretest score	Multi-syllable word spelling posttest score	Improvement
S1	M	0	0	0
S2	M	3	5	+2
S3	M	16	32	+16
S4	M	6	6	0
S5	M	3	11	+8
S6	M	34	46	+12
S7	M	57	77	+20
S8	M	0	6	+6
S9	M	1	2	+1
S10	F	1	3	+2
S11	F	0	0	0
S12	F	21	19	-2
S13	F	22	31	+9
S14	F	7	7	0
S15	F	25	18	-7
S16	F	19	3	-16
S17	M	6	12	+6
Total				+57

Full score = 98

In terms of the learning attitude, the result was what was expected. Table 3.2 listed the descriptive statistics of the pretest and posttest in the questionnaire of learning attitude<sup>2</sup>. Fourteen of the seventeen subjects showed positive changes in their learning attitude toward spelling multi-syllable English words and learning English. In the post-instruction questionnaire, 82% of the subjects agreed or strongly agreed with the statement that syllable-awareness based phonics instruction could help them spell words. Nevertheless, when it came to the question that the instruction helped to raise the subjects' interest, only 30% of the subjects agreed or strongly agreed with it. In conclusion, although the instruction was effective, it was limited in raising subjects' interests.

<sup>2</sup>For the calculation of the scores, please refer to p.33.

*Table 3.2 Descriptive Statistics of the Attitude Pretest and Posttest*

Ss	Sex	Attitude pretest score	Attitude posttest score	Improvement
S1	M	17	28	+11
S2	M	22	27	+5
S3	M	30	38	+8
S4	M	30	35	+5
S5	M	32	33	+1
S6	M	18	25	+7
S7	M	32	29	-3
S8	M	21	26	+5
S9	M	18	17	-1
S10	F	18	17	-1
S11	F	21	27	+6
S12	F	29	31	+2
S13	F	28	34	+6
S14	F	26	29	+3
S15	F	28	30	+2
S16	F	21	28	+7
S17	M	30	39	+9
Total				+74

Full score = 48

The Revision

Despite the overall encouraging results of the pilot study, the formal research was modified in some directions. Table 3.3 illustrates the modification.

*Table 3.3 The Modification of Research Design*

	<b>Pre- and Post-Spelling Tests</b>	<b>Instruction Periods and Time</b>	<b>Quiz</b>
Pilot Study	Untrained words	130 minutes (13 weeks, one 10-minute class per week)	None
Formal Study	Low-frequency words	330 minutes (11 weeks, two 15-minute classes per week)	One quiz per class

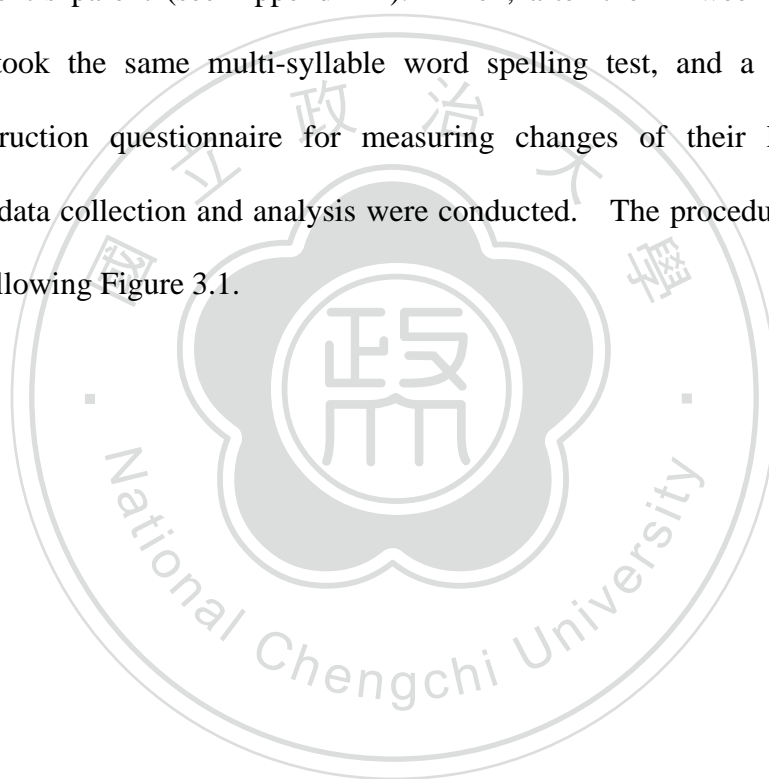
First, the pre- and post-tests of multiple-syllable words in the formal study were modified by using all low-frequency words, instead of untrained words. In the pilot study, the multi-syllable testing items were all untrained words. However, it was found that some subjects had learned them from their parents, tutors, or teachers in cram schools. In order to avoid the subjects' unjustified scoring from extra learning, the researcher finally decided to adopt low-frequency words for the spelling tests in the formal study. Second, in order for students to have more practice, the instruction time was increased from 130 minutes (13 weeks, one-10 minute class per week) to 330 minutes (11 weeks, two 15-minute classes per week). Third, a quiz was added after the instruction to stimulate the learning motivation of students.

### The Formal Study

The procedure of the formal study was administered in four stages in the fall semester of 2008 --- selecting subjects, instruction, accessing learners' progress and attitude changes, and data analysis.

Subjects in the formal study were two intact classes, each composed of thirty-three 7th graders (age 15) in a public junior high school in Keelung City. To make sure subjects in both groups had similar ability, one questionnaire and three tests were carried out. First, the pre-instruction questionnaire on learning (see Appendix B) was administered to eliminate subjects who had received extra phonics instruction from parents, tutors or teachers in cram schools. Next, the syllable counting test (see Appendix C) identified learners with poor syllable counting ability (their test scores under 50) to be chosen as potential subjects. Then, the mono-syllable word test (see Appendix D) and multi-syllable word pretest (see Appendix E) recorded by a native speaker were used to access subjects with similar

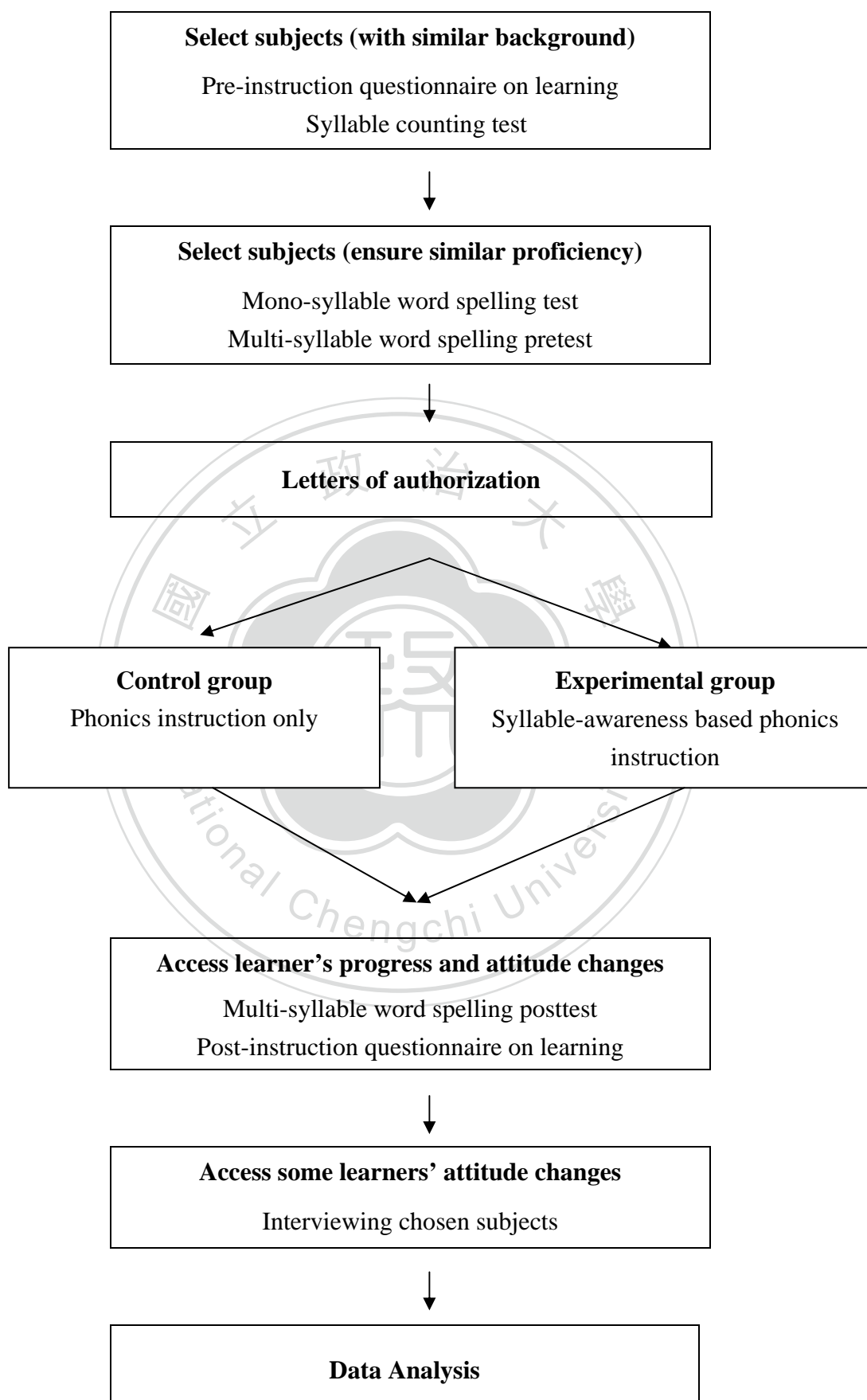
spelling ability. Although 66 students were originally selected, after conducting the questionnaire and tests, only 44 students of the two classes were counted as the subjects in the research<sup>3</sup>. These two classes were randomly assigned into the control and experimental groups. Class A which served as the experimental group, received syllable-awareness based phonics instruction while Class B as the control group received only phonics instruction. Before the instruction, each student in the two classes was given a letter of authorization to ensure the approval of the research from the student's parent (see Appendix F). Then, after the 11-week instruction, both groups took the same multi-syllable word spelling test, and a slightly different post-instruction questionnaire for measuring changes of their learning attitude. Finally, data collection and analysis were conducted. The procedure is summarized in the following Figure 3.1.



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<sup>3</sup> In each class, these 22 subjects received the instruction with other 11 students who did not match the condition for the study. Although students seemed not to share their skills of applying phonics or syllables with each other in or after class, the participation of these 11 students in class may still have some effect on the learning of the subjects.

Figure 3.1 The Procedure for Conducting the Formal Study



## Subjects

Two intact classes, each comprised of thirty-three 7th graders (age 15), were randomly selected from a public junior high school in Keelung City to participate in this research. According to the elementary school English curriculum, these 7<sup>th</sup> graders had already learned about 300 words and received phonics instruction for 4 years in elementary school (MOE, 2006). Their phonics knowledge included letter sounds, short vowel sounds, long vowel sounds, consonant sounds, consonant digraphs, and consonant clusters.

Next, students in these two intact classes were asked to fill out the pre-instruction questionnaire on learning (see Appendix B) and then took the syllable counting test (see Appendix C). Chosen as final subjects in each class were 22 subjects who (1) did not join cram schools and (2) scored under 50 in the syllable counting test. These two classes were randomly assigned as an experimental group (receiving syllable-awareness based phonics instruction) and a control group (receiving phonics instruction only). As shown in Table 3.4, the equal members of male and female students were chosen in the two groups.

*Table 3.4 Gender and Number of Students in both Groups*

<b>Group</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Control	11	11	22
Experimental	11	11	22

Moreover, two pretests: the mono-syllable spelling test (see Appendix D) and the multi-syllable word spelling pretest (see Appendix E), were conducted to make sure that there was no proficiency difference between the two groups in spelling mono-syllable and multi-syllable words.



Independent-samples t-test result of the mono-syllable word spelling pretest (see Table 3.5) showed that both groups got low scores and that there was no significant difference between the two groups ( $t = -0.708, p > .05$ ). That is, the result suggested that the mono-syllable word spelling ability of the two groups were alike.

*Table 3.5 The Result of the Mono-syllable Word Spelling Pretest between Groups*

<b>Group (N in each group=22)</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>Sig.(2-tailed)</b>
Control	6.50	6.33	-0.708	0.483
Experimental	7.86	6.44		

Note. 1. Total scores = 34

2. \* $p < .05$

Table 3.6 presented the independent-samples t-test result of the multi-syllable word spelling pretest. It showed that the mean scores of both groups were low and there was also no significant difference between the two groups ( $t = 0.238, p > .05$ ). In other words, subjects' multi-syllable word spelling abilities were similar.

*Table 3.6 The Result of the Multi-syllable Word Spelling Pretest between Groups*

<b>Group (N in each group=22)</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>Sig.(2-tailed)</b>
Control	12.73	17.55	0.238	0.813
Experimental	14.00	17.89		

Note. 1. Total scores= 117

2. \* $p < .05$

In conclusion, both the control group and the experimental group were considered to be homogeneous in spelling mono- and multi-syllable words before the instruction.

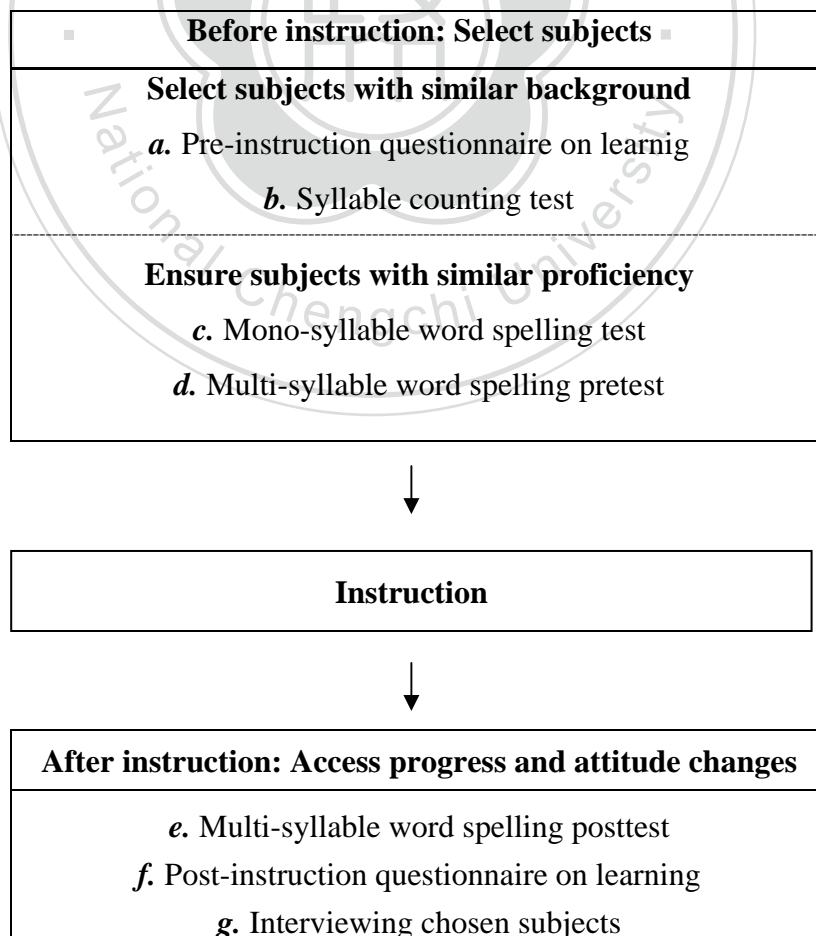
## Instruments

To collect the data for further analysis, we use two types of instruments containing testing materials and teaching materials. Criteria for scoring were also introduced in this section.

### Testing materials

Testing materials were divided into two categorizes according to the time they were administered --- before or after the instruction. Figure 3.7 provides an outline of the use of all the testing materials.

Figure 3.2 The Usage of the Testing Materials



Before the instruction, a pre-instruction questionnaire on learning, a syllable counting test, a mono-syllable word test, and a multi-syllable word pretest were given to the subjects to ensure that subjects' production of English word spelling were similar before the instruction.

*a. The design of pre-instruction questionnaire on learning* (the original questionnaire is attached as Appendix B)

The questionnaire was designed to obtain the subjects' background information, and learning attitude. Of the 7 questions, Questions 1-4 investigated the background information of subjects, Q5-6 explored subjects' learning attitude, and the final open-ended question, Q7, asked subjects' difficulties.

Among the background questions, Question 1 was about learners' gender so as to select the same number of subjects in each gender; Questions 2-3 were designed to eliminate students who already learned syllable-awareness based phonics instruction or were currently having extra help from cram school or private tutoring. Question 4 investigated the methods of students in learning vocabulary so as to remove those who had already learned syllable-awareness based phonics instruction before the research. All the 66 students in the two classes were asked to recall which methods they used to memorize English vocabulary --- "letter-by-letter", "phonics", "syllable-dividing", "phonics and syllable-dividing", or others. Students who chose the two options of "dividing words into syllables" or "phonics and syllable-dividing" were excluded.

For the learning attitude questions, Questions 5-6, the same four-point scale questions to be used in the post-instruction questionnaire, assessed the learning attitude of the subjects. Question 5 explored subjects' attitude toward English vocabulary learning and Question 6 asked about their overall attitude toward learning English. Both questions included the same six options for students to choose--- "easy", "interesting", "challenging", "difficult", "boring", and "complicated". The first three are counted as subjects' positive attitude and the other three as their negative attitude. Subjects would indicate their degree of consent for each option by selecting one of the four choices--- "strongly agree", "agree", "disagree", and "strongly disagree", each to be assigned 4, 3, 2, and 1 point respectively. As for the negative options, the scores would be the reverse, as 1, 2, 3, and 4 point. For instance, if a subject "strongly agrees" that learning English is easy (+ attitude), he/she can get 4 points. On the other hand, if a subject "strongly agrees" that learning English is difficult (-attitude), he/she can only get 1 point<sup>4</sup>.

Finally, an open-ended Question 7 tried to find out learners' difficulties in memorizing vocabulary<sup>5</sup>.

The questionnaire was given to both classes at the beginning of the first class. Because there were several different formats in the same questionnaire, the researcher read each question one by one and explained how to answer each of them. The administration of the questionnaires took about 20 minutes.

<sup>4</sup> The scoring was based on four points Likert's scales (Oppenheim, 1999) to obtain subjects' consent for each question.

<sup>5</sup> In the spirit of action research, the teacher-researcher designed the syllable counting test to ensure the concept of syllables. The test words were mostly chosen from the textbook.

*b. The design of syllable counting test<sup>6</sup>* (see Appendix C)

The purpose of the syllable counting test was to assess the subjects' concept of syllables so that only those who scored low in the test would be selected as subjects for training. Chosen at random were twenty words; numbers of syllables ranging from 1-5. The twenty items included four 1-syllable words, four 2-syllable words, four 3-syllable words, four 4-syllable words, and four 5-syllable words. All the 1- to 4-syllable words and one 5-syllable word (aboriginal) were adopted from junior high school textbooks. The other three 5-syllable words were adopted from a popular reference book *Classroom Smart Vocabulary for Senior High 7000* (Seale, 2005) to compensate for a lack of 5 syllable-words in the textbook.

The test was recorded by the researcher. To make sure the subjects knew what to do in the test, the instruction was given in Mandarin Chinese, with two examples to illustrate how to answer the test for each word. Each word was repeated twice. Subjects needed to write down the number of syllables for each word they heard. Each correct answer was given 5 points and the total score was 100. However, only those scoring under 50 were selected as subjects. The administration of the syllable counting took about 15 minutes.

*c. The design of mono-syllable word spelling test* (see Appendix D)

In order to ensure the 44 subjects were homogeneous in their spelling level before the instruction, a mono-syllable word spelling pretest was conducted. The

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<sup>6</sup>The findings of Q7 are only intended for the teacher-researcher's future reference, not directly related to the present study.

spelling test included 11 one-syllable words, all low-frequency real words, to check if subjects had similar concept of letter-sound correspondence on 5 short, 5 long vowels and 21 consonants. Table 3.7 showed the correspondence between the target sounds and the mono-syllable test words. They were selected from the 2000 most common spoken or written words in Longman Dictionary (Summers, 2003) and the basic level 2261 words in Wen Shin Dictionary (Yang, 1993).

*Table 3.7 Correspondence between Target Letters and Mono-syllable Test Words*

5 short vowels	5 long vowels	21 consonant letters			
a---max	a-e---halle	b---bode	h---hale	n---yon	t---jute
e---fez	e-e---peke	c---wac	j---jute	p---peke	v---guv
i---qu <sup>7</sup> iz	i-e---sire	d---bode	k---peke	qu <sup>7</sup> ---qu <sup>7</sup> iz	w---wac
o---yon	o-e---bode	f---fez	l---halle	r---sire	x---max
u---guv	u-e---jute	g---guv	m---max	s---sire	y---yon
					z---fez

The test was recorded by a native speaker and the instruction was given in Mandarin Chinese. Each word was repeated three times. The testees would score one point for each correct phoneme (e.g. “max” has 3 points ---“m”, “a”, “x”. The spelling of “maks,” though not correct, still counts as 3 points because it shows that the subject has mastered the strategy in matching this letter-sound correspondence). The total scores were 34 for this test. The detailed scoring for each word was listed in Appendix D. All the 44 selected subjects took the mono-syllable word spelling test in the second week to avoid their tiredness in taking too many tests in a row.

<sup>7</sup> The target letters “qu” for /kw/ sounds were used to measure if the students have the strategy in matching this letter-sound correspondence.

Students listened to the CD and spelt out the words on their test paper. Meanwhile, they were informed that although the test items were all low-frequency words, they were encouraged to apply their phonics skills to spell. The administration of the mono-syllable word test took about 10 minutes<sup>8</sup>.

*d. The design of multi-syllable word spelling pretest* (see Appendix E)

A multi-syllable word pretest was designed to make sure that subjects were at the same beginning level in spelling multi-syllable words. The spelling test included 5 each of two-, three-, and four-syllable words. These 15 words were chosen to see if students who were aware of syllables could predict the letter-sound correspondence more correctly. They were all low-frequency words out of the most common 2000 spoken or written words in *Longman Dictionary* (Summers, 2003) and the basic level 2261 and intermediate level 6638 words in *Wen Shin Dictionary* (Yang, 1993).

The test was also recorded by a native speaker and the instruction was given in Mandarin Chinese. Each word was repeated three times. A subject got one point when he/she answered one right phoneme (e.g. “jasper” has 5 points --- “j”, “a”, “s”, “p”, “er” and “bikini” has 6 points --- “b”, “i”, “k”, “i”, “n”, “i”). The total scores were 117. The detailed scoring for each word was listed in Appendix E. The subjects took the multi-syllable word test after the mono-syllable word test to avoid their fear of spelling long words. In a manner similar to the other spelling test, subjects would listen to the CD and then spelt out each test word on their test paper.

<sup>8</sup> In the spirit of action research, the teacher-researcher designed the mono-syllable word spelling test to ensure subjects' homogeneity. As shown in 3.5 (p. 30), the result of the mono-syllable word spelling test indicated that subjects were homogeneous.

They were also informed that though the test words were all low-frequency words, they should still try their best to apply their phonics skills to spell. The administration of the multi-syllable test was about 15 minutes.

Since the purpose of the research was to evaluate the effects of instruction on subjects' performance on spelling multi-syllable words, the same test was conducted after the instruction. Due to the fact that the mono-syllable word test was used only to assess the spelling level of these subjects before the instruction, there was only a pretest but no posttest after the instruction<sup>9</sup>.

*e. The design of multi-syllable word spelling posttest* (same as the pretest)

To assess the progress of the subjects from the instruction, the same multi-syllable word test was used after the instruction. The procedure was the same as the pretest. The researcher did not inform subjects that they would have the test again to prevent them from memorizing or reviewing the test words. Since all the test words were low frequency words and were retested after the long instruction, the researcher assumes that it was unlikely for subjects to remember all these words or review them.

*f. The design of post-instruction questionnaire on learning*

(see Appendix G-1&2)

The questionnaire mainly attempted to detect the subjects' learning attitude

<sup>9</sup> In the spirit of action research, the teacher-researcher designed the multi-syllable word spelling test to make sure subjects' homogeneity. As shown in 3.6 (p. 30), the result of the multi-syllable word spelling test indicated that subjects were at the same beginning level.



changes. There were 11 questions in a mostly four-point scale format. Questions 1-2 (Q1-2), in a multiple choice format, double-checked learners to see if they had received extra vocabulary learning during the experimental period. Qs 3-7 were designed to investigate the learners' attitude toward the effects of the instruction. In Q3, the subjects were asked if the instruction ("syllable-awareness based phonics" or "phonics only") can help him/ her spell. Question 4 investigated if the instruction ("syllable-awareness based phonics" or "phonics only") can help subjects remember the spelling of new words. Question 5 asked if the subjects feel they understand better the letter-sound correspondence rules after the instruction. Question 6 focused on whether they feel their spelling ability has improved after the instruction. Finally, Q7 explored if subjects are more willing to try to spell longer words after the instruction. Subjects needed to point out their degree of consent for each question (Qs 3-7) by selecting one of the four choices---"strongly agree", "agree", "disagree", and "strongly disagree." The number of subjects who chose stronger agreement and agreement were calculated later by showing the percentage. Then, Q8 in the post-instruction questionnaire asked subjects' attitude toward the teacher's method on spelling instruction. The choices for Q8 included six descriptive options--- "clear", "easy to remember", "interesting", "confusing", "hard to remember", "difficult to handle". The first three are counted as subjects' positive attitude and the other three as their negative attitude. Subjects were to indicate their degree of consent for each descriptive option by selecting one of the four choices---"strongly agree", "agree", "disagree", and "strongly disagree." The number of subjects who chose stronger

agreement and agreement were calculated later by showing the percentage. Q9-10, the same as Q5 and Q6 in the pre-instruction questionnaire, were designed to assess the subjects' attitude change toward vocabulary learning and English learning by comparing the pre-instruction questionnaire with the post-instruction questionnaire. They would be counted in the same manner as the pre-instruction questionnaire. Finally, Q11 in an open-ended question format tried to perceive learners' difficulty in using the spelling method taught in each group. All the learning difficulties were listed and classified for later discussion.

The procedure was the same as the pre-instruction questionnaire. Even though this is the second time for them to fill out the questionnaire, due to the fact that several questions were different from the pre-instruction questionnaire, the researcher still read each question one by one, and explained how to answer each of them.

#### g. Interview design

The interview was used to get in-depth information about some learners' difficulties. It was employed only on subjects who participated actively or showed positive attitude to learn in class, but performed poorly on the tests. The interview started with some encouraging remarks about the performance of the interviewee to release his or her anxiety, and then moved on to the following three questions.

1. Is the method (phonics only or syllable-awareness based phonics) on spelling words difficult for you?
2. Which part is most difficult for you?

### 3. Why do you think you did not improve?

(Do you need more practice or more instruction?)

The interview took place in the researcher's office individually. The total process was recorded, transcribed and analyzed to reveal the difficulties of the instruction.

#### Teaching Materials and Instruction

The teaching materials used in the two groups were similar. The only difference was that the words taught to the experimental group were instructed with syllable-awareness based phonics and the control group with phonics only.

The instruction was revised based on the pilot study and the modification of the instruction time was illustrated in Table 3.8.

Table 3.8 *The Modification of the Instruction Time*

<b>Modification</b>	<b>Instruction Periods and Time</b>
Pilot Study	130 minutes (13 weeks, one 10-minute class per week)
Formal Study	330 minutes (11 weeks, two 15-minute classes per week)

The instruction in the pilot study was carried out by the researcher for 13 weeks. Each period took 10 minutes, one class per week at the end of the regular class<sup>10</sup>. Thinking about learners' willingness, Celce-Murcia et al. (1996) suggested that the suitable length of the instruction time for phonics is about 5 to 10 minutes. However, considering the response and performance of the subjects in the pilot study, the researcher found that the spelling activity seemed to be more difficult than the

<sup>10</sup> The regular class generally included the instruction of vocabulary, sentence patterns, a dialogue, or part of KK phonetic symbols. The instruction of the KK phonetic symbols is a part of a lesson and usually at the end of each lesson.

pronunciation activities involved in phonics. Thus, the total instruction time for the formal study was increased from 130 to 330 minutes. Not only was each instruction period lengthened to 15 minutes<sup>11</sup> to offer more exercises, a quiz was added. Moreover, there were 2 classes per week in the formal study, instead of just one in the pilot study.

The teaching materials in the formal study contained short vowels, consonants, vowel digraphs, and consonant clusters (see Appendix H-1 & H-2). The teaching sequence was modified from the suggested phonics teaching sequence of Lin (2002). Lin (2002) combined the teaching sequence of Flesh, Cattedano, and Gunning teaching (Flesh, 1995; Gattegno, 1976; Gunning, 1996) and suggested to teach in the order of short vowels, consonants, consonant clusters, and vowel digraphs. However, considering the fact that the vowel digraphs, “er, or, ar,” appeared early and frequently in the junior high school textbook, the researcher has moved the vowel digraph instruction before the consonant clusters.

In addition, about 3 to 7 target letters were instructed in each week and they were specially designed to include the knowledge needed for the pre-test and post-test. Then, based on the weekly target letters, the instruction was divided into two periods. (see Appendix H-1 & H-2) In each period, there were 2 example words for each target letter, followed by 5 exercise words and finally 1 test word. To give as example words, the researcher chose a mono-syllable word and an untrained

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<sup>11</sup>In certain aspects, the 15-minute instruction was influenced by the regular classes. It is noticed that some parts of KK phonetic symbols were instructed in the regular class for both groups based on their textbook --- the Kang Hsuan 7<sup>th</sup> grade junior high school textbook (Hung, 2008). The phonetic symbols covered in the textbook were /m/, /n/, /p/, /b/, /θ/, /tʃ/, /k/, /g/, /t/, /d/, /j/, /w/, /h/, /f/, /v/, /n/, /ŋ/. In addition, the textbook usually included a tongue twister for learners to practice the target symbols. Although the pronunciation instruction was not overtly related to the phonics instruction, it may still have indirectly trained the subjects on the relationship between the letter-sound correspondences.

multi-syllable (usually bi-syllable) word to remind students of the relationship between each target letter and its sound correspondence. The same target letters and example words of the first period were reviewed in the second period. Next, the 5 exercise words for every period were provided. In the first period of each week (period 5, 7, 9, 11, 13, 17, 19, 21, 23), the researcher used all mono-syllable low frequency exercise words to practice the letter-sound correspondences of the target letters. Then, in the second period (period 6, 8, 10, 12, 14, 15, 18, 20, 22, 23, 24), all multi-syllable low frequency exercise words were utilized for subjects to truly practice their phonics skills on spelling multi-syllable words. Finally, 1 test word (all multi-syllable low frequency words) was given in the quiz of each period. Note that words in the pre- and post- tests were not mentioned during the instruction. Thus, students' encoding abilities could truly be measured and reflected in the tests given before and after the instruction.

A sample lesson plan is provided to illustrate the 15-minute spelling instruction (see Appendix I-1 & I-2). Appendix I-1 covers the class on September 23, 25 (period 5, 6) for the experimental group, while Appendix I-2 is the lesson plan for the control group on September 22, 24 (period 5, 6). Each period followed the same sequence --- presentation, practice, production, and a spelling quiz.

Each class could be divided into 2 parts. The first part was a 5-minute presentation and practice, to be followed by an eight-minute production. Both groups received the same instruction in the first part. First, in the 5-minute presentation and practice part, the teacher used implicit-explicit phonics instruction to

make students detect the target sounds' letter-sound correspondence. For instance, in order to teach the target letter *a*, the teacher offered two example words (*sad, happy*) for students to generalize the letter-sound correspondence of the target letter, *a* for /æ/. Then, students were encouraged to give more examples to practice the rule. Ideally, they should come up with words from the vocabulary taught in their elementary or junior high school English textbook (e.g. *cat, cap, hat*). In order to encourage students' participation, each student who gave the correct words with the target letter-sound correspondence could get an extra point to his/ her personal grade.

Note that between the two groups the only instruction difference was in the 8-minute production that follows. Even though the same 5 exercise words were used for both groups, the spelling instruction was different. In the experimental group (syllable-awareness based phonics), the researcher read a target word, asked students to count syllables and then drew on the blackboard a line under each syllable of the target word. Finally, the students would spell aloud the word syllable by syllable<sup>12</sup> (see Appendix I-1). For example, the teacher read /ræpɪd/ for 2-3 times and asked student how many syllables the word has. After students answered "2 syllables", the teacher drew two lines on the blackboard. Students would then spell out *ra* for the first line and *pid* for the second line. On the other hand, in the control group (phonics only), after reading a target word with the phonics rule, the researcher drew the lines under each of the letters of the target word on the blackboard, and asked the students to spell it aloud (see Appendix I-2). For example, the teacher read /ræpɪd/

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<sup>12</sup> The instruction design of syllable-awareness based phonics was inspired by Elkonin's sound boxes to segment individual phonemes in the word (Elkonin, 1973). The present study drew the lines under each syllable to replace the boxes for encoding the multi-syllable words.

for 2-3 times while drawing five lines under each letter on the blackboard. Then, students would spell out *r* for the first line, *a* for the second line, *p* for the third line, *i* for the fourth line and *d* for the last line. In other words, the only difference between the two groups was in how each target word was underlined to spell. In the experimental group, the instructor not only called students' attention to syllabification, but also drew a line under each syllable of the target word, while in the control group, the instructor only drew a line under each letter of the target word.

Finally, a short quiz was added for increasing the motivation of spelling practices. The quiz included only one word which needs one of the target letter-sound correspondence rules just taught in class. After the instructor read it aloud, the subjects should spell it on the test paper and the one who answered correctly was rewarded by gaining one point to his or her personal grade.

### Data Analysis

The analysis was conducted by using the Statistical Package for the Social Science (SPSS) version 12.0 for Windows to compute the data.

To answer the first research question, independent-samples t-test was conducted to find out the effects of syllable-awareness based phonics instruction and phonics instruction. Before the instruction, the pretest scores were computed to see if the two groups were homogeneous. Then, after the different instruction, the posttest scores were calculated to detect if there were any significant differences between the two groups.

As for the second research question, data analysis was carried out from both questionnaires and interviews. Questions in the questionnaire were analyzed in two different ways. On the one hand, the two questions asked in both pre- and post-instruction questionnaires, were computed, based on the four points Likert's scales<sup>13</sup> (Oppenheim, 1999). Then, the results between groups were calculated by using independent-sample t-test to explain learner's attitude change. The scores of the pre-instruction questionnaire were used to ensure that the subjects were homogeneous before the instruction on their attitude toward memorizing vocabulary and learning English. However, the scores of the post-instruction questionnaire on learning were utilized to see if there was any significant difference between the two groups. Finally, the results of these two questions were also analyzed within each group for further discussion. On the other hand, the 5 questions (Q3-7) only asked in the post-instruction questionnaire were discussed. The number of subjects who "strongly agreed" or "agreed" with each question was calculated and the results were presented by showing the percentage of agreement. In addition to the questionnaire for answering the second research question, interviews were employed. They were transcribed and analyzed to reveal other possible factors not detected in the questionnaire.

In this chapter, the researcher introduces four parts of the methodology --- the research design, subjects, instruments, and data analysis. All of them are the main

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<sup>13</sup>According to four points Likert's scales, subjects would indicate their degree of consent by selecting one of the four choices--- "strongly agree", "agree", "disagree", and "strongly disagree", each to be assigned 4, 3, 2, and 1 point respectively. As for the negative descriptions, the scores would be the reverse. For instant, if a subject "strongly agrees" that memorizing vocabulary is easy (a positive attitude), he/ she can get 4 points. On the other hand, if a subject "strongly agrees" that memorizing vocabulary is difficult (a negative attitude), he/ she will only get 1 point.



elements of the research. In the next chapter, I will show the results after operating the methodology, and the discussion about the results is also included.

