CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to describe the design and procedures of the study. This chapter is divided into four sections: subjects of the study, research instruments, data collection, and data analyses and statistical devices.

3.1 Subjects of the Study

The subjects participating in this study were sixty students from the Faculty of Natural Resources who were taking English for Agriculture as an elective subject in the second semester of the academic year 2003 at Prince of Songkla University, Hat Yai Campus. They were chosen to take part in this study because they had already been studying with similar kind of CALL lessons so it did not take much time to make them familiar with the computers and the CALL packages used in this study.

3.2 Research Instruments

In order to obtain information for this study, the following instruments were used:

3.2.1 Computerized pre-tests and delayed post-tests: these two tests were identical (see **Appendix A**); they were used to determine the students' knowledge of the two grammatical aspects ("Articles" and "There is/There are and Have/Has") before and two weeks after using the packages. These tests were also used to find out which group performed better.

3.2.2 Computerized progress tests: there are two progress tests; one was administered immediately after the subjects had finished the lesson on "Articles" and the other after the lesson on "There is/There are and Have/Has" (see **Appendix B**). These two tests were also used to find out which group performed better.

All of the tests were objective in that they used a multiple-choice format since it was objective, reliable, and easy to administer and score (Hughes, 1996; Heaton, 1997; Bailey, 1998). There were fifteen items in each test. The tests were approved by two Thai English teachers and two native speakers of English. The tests were piloted with 30 students from the Faculty of Natural Resources who had similar English learning backgrounds to the subjects of the study. All the test items were statistically analyzed. The items which met an item difficulty index or facility value between 0.20 and 0.80 and a discrimination index ≥ 0.20 were chosen to be used in the study (Kijpreedaborisuth, 2000).

The reliabilities of all the tests were calculated using the Kuder Richardson 20 formula (KR-20). It revealed that the reliabilities of the tests were acceptable in that they met the criteria set forth by Harris (1969) and Cohen (1994) which is ≥ 0.60. **Table 3.1** shows that the reliabilities of the pre-test and delayed post-test, and the progress test on "Articles" were 0.73 and 0.74 respectively. Also, the reliabilities of the pre-test and delayed post-test, and the progress test on "There is/There are and Have/Has" were 0.83 and 0.82 respectively.

Table 3.1 The Statistic Information from the Pilot Study

Test	N	No. of items	Mean	S.D.	KR-20 R_{tt}
1. Pre-test and delayed post-test (Articles)	30	15	9.37	3.06	0.73
2. Progress test (Articles)	30	15	8.27	3.30	0.74
3. Pre-test and delayed post-test (There is/There are and Have/Has)	30	15	8.40	3.79	0.83
4. Progress test (There is/There are and Have/Has)	30	15	8.10	3.76	0.82

Furthermore, both tests of each grammatical aspect were parallel because the mean scores and the standard deviations of each pair were nearly the same (see **Table 3.1**). In other words, the mean scores and the standard deviations of the pre-test and

delayed post-test, and the progress test on "Articles" were 9.37, 3.06 and 8.27, 3.30 ($r = .548$, $p = .003$). The mean scores and the standard deviations of the pre-test and delayed post-test, and the progress test on "There is/There are and Have/Has" were 8.40, 3.79 and 8.10, 3.76 ($r = .818$, $p < .001$). In addition, each pair was written according to the same test specifications so that the instructions, format, number of items and content were as similar to each other as possible (Alderson et al., 1996).

3.2.3 Grammatical CALL lessons: there were two lessons: the use of "Articles" and the use of "There is/There are and Have/Has". The two CALL packages were developed by the researcher. The content and formal explanations were approved by the two advisors. For a conversational explanation style, the students preferring a conversational language style helped edit the conversation explanations the researcher wrote. After that, the teachers who taught Thai at Thairath Wittaya 29, Phuket, Thailand and Wat Trimarksathit School, Phang-nga, Thailand (see **Appendix C**) read through the draft to make sure that the explanations were written in a conversational style.

The CALL lessons, the researcher developed and designed the two CALL packages under a close advisors' supervision. Each lesson had two versions. Both versions of each lesson had the same features such as content, sound, picture, animation, font, color and so forth, except the styles of Thai explanations (see **Appendix D**). One gave the explanations in formal Thai and the other gave the explanations in conversational Thai. All lessons consisted of a tutorial and an exercise. The tutorial explained the grammatical rules. As students worked through the exercises they were given immediate feedback explaining why the answer was correct or if it was incorrect, what the correct answer was and why. All lessons were designed in such a way that the researcher could track the 'click back' history of individual students and the time each student spent on each lesson (see **Appendix E**). This information provided the basis for the researcher to perform in-depth interviews with the subjects. After the grammatical CALL packages had been already created, they were piloted with the 30 students who had completed the pre-tests.

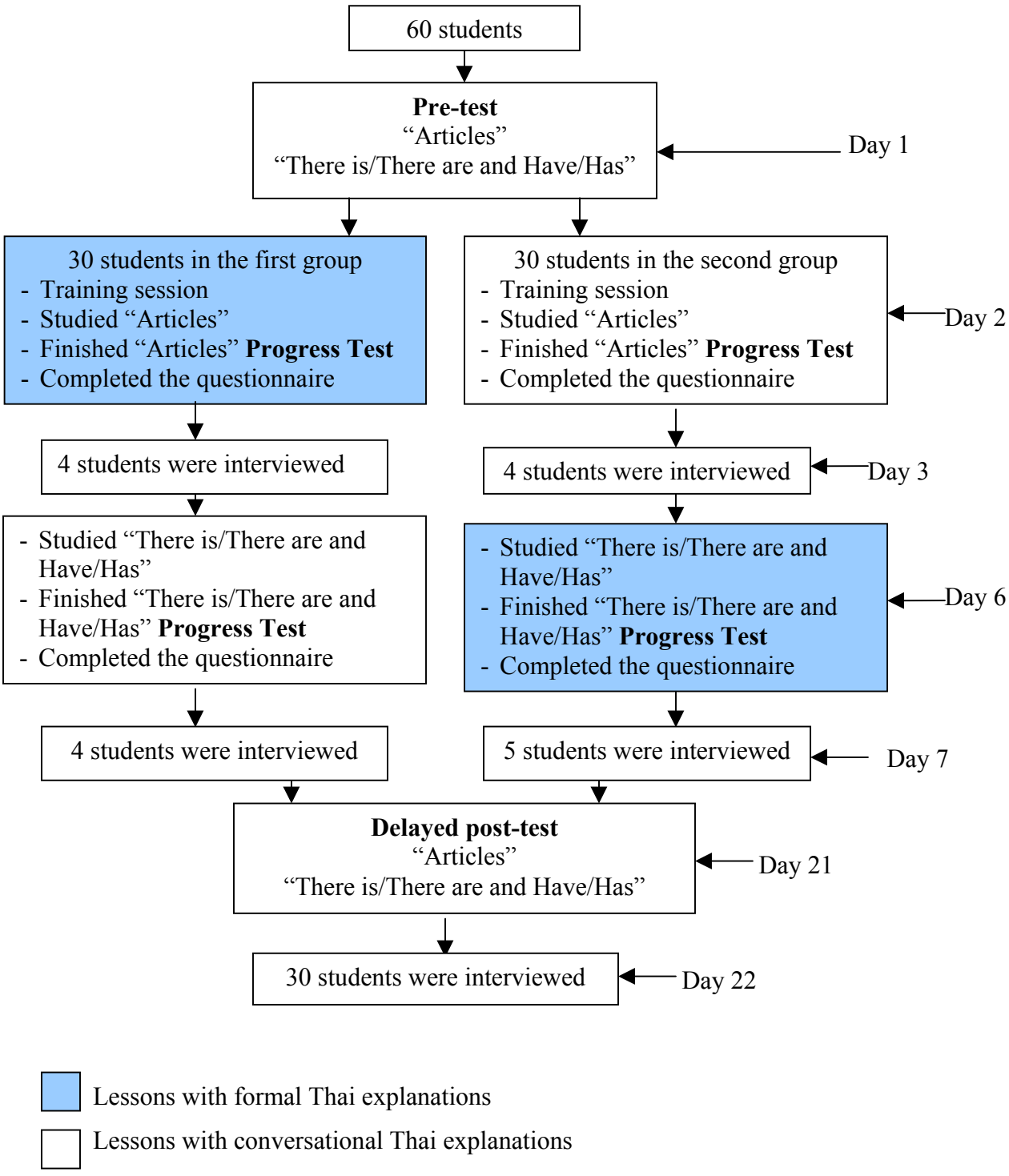
3.2.4 Questionnaires were used to find out students' attitudes towards the grammatical CALL lessons and the styles of the explanations used in the lesson (see **Appendix F**). It was designed according to Osgoods Scale. There were seven scales in the questionnaire. It included twenty-two items: thirteen items (1-11, 14 and 22) were the statements measuring attitudes towards the CALL packages and nine items (12, 13, 15-21) measured about the attitudes towards the explanation styles. Four of the items (4, 10, 16, and 19) were negative statements, so before calculating the mean scores of each item, these four items were recoded. The questionnaire was also given to 30 students from the Faculty of Natural Resources after they studied the "Articles" package. It was found that the reliability of the questionnaire was 0.87 showing that the questionnaire was acceptable (Harris, 1969; Cohen 1994) as mentioned earlier.

3.2.5 Interviews: there were two interviews: ongoing interviews and final interview. Each ongoing interview was conducted following the completion of the questionnaires and aimed to obtain in-depth information about the students' attitudes towards the explanation styles. The final interview also aimed to obtain in-depth information about the students' attitudes towards the explanation styles. The information from the tests, click back history, questionnaires was used as the basis for the interviews (see **Appendix G**). The questions for the interviews were tried out with five students who were randomly selected from 30 students studying the "Articles" package and completing the questionnaire. It was found that the questions for the interviews could be used.

3.3 Data Collection

The data collection procedures were summarized in **Figure 3.1** below.

Figure 3.1 Research Design



3.3.1 Before the commencement of the study, all of the students completed the computerized pre-tests on "Articles" and "There is/There are and Have/Has". Based on their pre-test scores (see **Appendix H**), the students were paired and randomly assigned into two groups so that the ability of both groups in using these two grammatical aspects was nearly the same.

3.3.2 A 20-minute training session was offered to ensure that the students were familiar with the package so that they could learn without feeling frustrated (Hoffman, 1996; Dudley, 1997; Johnson and Brine, 1999; Jones, 2001). The students were informed as to the objectives of these grammatical CALL packages as well as the advantages the students would gain from the learning experience. They were not notified that the explanation styles were the focus of this study. They then studied the "Articles" lesson from the package. The first group studied with formal Thai explanations while those in the second group studied with conversational Thai explanations (see **Figure 3.1**). After finishing the lessons, they had to complete the computerized progress-test on "Articles," then respond to the questionnaire.

3.3.3 The following day after the students completed the progress test, it was planned to interview 18 students based on their click back history. In other words, nine of them from each group were meant to be selected on the basis of their click back history: three students with the highest number of click back, three with the lowest number of click back, and the other three with a moderate number of click back. The researcher used a stratification technique to determine the highest, lowest, and moderate numbers of click back. For example, if the highest number of click back was 45, then 45 would be divided by 3. As a result, the three groups were as follows: those who clicked 45-30 times were categorized in the highest click back group, those who clicked 29-15 times were categorized in the moderate click back group, and those who clicked 0-14 times were categorized in the lowest click back group.

However, the actual number of students who were interviewed did not turn out as planned because there were many students who did not use the click back at all (see **Appendix I**). Consequently, only four students studying with the formal explanation style and four students studying with the conversational one were selected to participate in the first ongoing interview, while five students studying with the formal style and four students with the conversational one were selected to participate in the second ongoing

interview. As a result, there were seventeen students in total from both experiments to be interviewed, as delineated in **Table 3.2**.

Table 3.2 Numbers of the Students Using the Click Back

Group	1st Experiment		2nd Experiment	
	Formal	**Conversational**	**Formal**	**Conversational**
Highest Click Back	1	1	2	1
Moderate Click Back	0	0	0	0
Lowest Click Back	29	19	28	29
Numbers of Students Joined the Interview	4	4	5	4

3.3.4 The second experiment followed the same sequence as the first experiment except for the training session and the content. At this session, the students studied "There is/There are and Have/Has" from the packages. The first group now received the conversational explanation style while the second group had the formal one. After studying the lesson and completing the progress test, the students had to respond to the questionnaires including three parts, which was unlike the ones used in the first experiment, which had only two parts (see **Appendix F**). In the third part of the questionnaire, the students had to answer the questions "Which style of explanation in which lesson do you prefer?" and "Why?" since the students from both groups experienced both styles of the explanations. Most of the students misunderstood the questions because they mostly focused on other features of CALL lessons such as animations, graphics, computer lessons, but not on the explanation styles. So, the results obtained from this part of the questionnaires were not taken into account. To probe for in depth and specific information for the above questions, these questions were included in the final interview conducted two weeks later.

3.3.5 Two weeks after the second progress test on "There is/There are and Have/Has", the delayed post-tests were administered. As mentioned above in 3.3.4 that the students misunderstood the questions in the third part of the questionnaires so the plan

to interview only 12 students in the final interview was changed. To obtain more relevant data, the number of the students participating in this interview increased from 12 to 30.

3.4 Data Analyses and the Statistical Devices

In this study, there were two variables: 1) independent variables - formal and conversational explanation styles and 2) dependent variables -'click back' history, time of the interactions, test scores, and attitudes towards the explanation styles. The information was analyzed quantitatively and qualitatively. Therefore, some statistics were analyzed using the SPSS program.

3.4.1 A paired t-test was used to compare the mean scores of the pre-tests and delayed post-tests in order to determine the students' achievements in each grammatical aspect.

3.4.2 A t-test was used to compare the mean scores of each test from both groups to find out which group performed better; it was also used to compare the mean scores of the questionnaires to find out students' attitudes towards the CALL packages and the explanation styles.

3.4.3 The data obtained from the interviews was analyzed qualitatively in conjunction with the 'click back' history and time of the interactions, and the test scores. Then the information from the interviews was summarized. The data gained from ongoing interviews was analyzed by a non-parametric McNemar's Test since the data was derived from a small group of students and each student could provide more than one answer for each question.