CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the design and procedures of the study. It is divided into four sections: the research subjects, the research procedures, data collection, and data analysis.

1. Research Subjects

The subjects of this experimental study were 84 science program M.4 students who were studying the Fundamental English course 12 (Eng. 018) in the second semester of the academic year 2000 at Nawaminthrachuthit Taksin School in Songkhla Province. The research subjects were all Thai native speakers and their average age was 16. They spent four periods of 50 minutes per week studying the Fundamental English course 12.

2. Research Procedures

This section discusses three research procedures including the selection of the research subjects, selection of teaching approaches and construction of the research instruments.

2.1 Selection of the Research Subjects

The 84 research subjects were selected from four classes of 135 science program students who were studying in the second semester of the academic year 2000 at Nawaminthrachuthit Taksin School. Firstly, the sum of the midterm and final test scores of each of the four classes of the students on the Fundamental English course 11 (Eng. 017) in the first semester of the academic year 2000 was calculated for the means. The comparison of the mean scores of the students' English achievement is presented in Table 1. It was found that the mean scores of the class 4/2 and 4/4 were approximately similar. That is, the mean score of the class 4/2 was 35.91, and that of the class 4/4 was 35.02.

Table 1   Mean Scores of the Midterm and Final Tests of the Course Eng. 017 of M.4 Students in Science Program

Class	No. of the Students	Mean Scores of the Sum of the Midterm & Final Test	S.D.
4/1	40	38.10	6.02
4/2	45	35.91	6.27
4/3	46	33.90	6.68
4/4	44	35.02	8.71

Secondly, to ensure that the subjects of both classes (4/2 and 4/4) had similar level of English achievement, the mean scores of these two classes were compared using a t-test as shown in Table 2.

Table 2 Comparison of the Mean Scores of the Course Eng. 017 of the Research Subjects

Class	No. of the Students	Mean	df	f	t-value	two-tailed test
4/2	45	35.91	87	5.94	.55	>.05
4/4	44	35.02			.	

With respect to the data in Table 2, the resulting t-test score was .55 which did not indicate a statistically significant difference (p>0.05). This means that the English language achievement levels of these two groups of the students were not statistically different. Finally, one of the two groups was assigned as the experimental group, studying grammar through games and the other as the control group, studying grammar through non-game activities.

Initially, all 89 students of the two classes of 4/2 and 4/4 participated in the study. However, five students from both groups, missed either the pre-, post-test or both tests. Therefore, only 84 students were recruited as the research subjects. There were forty-two students in each group. Table 3 shows the distribution of the subjects in the main study.

Table 3 Distribution of the Subjects in the Main Study

No. of Subjects	Control Group		Experimental Group	
	Male	Female	Male	Female
84	16	26	14	28
	42		42	

2.2 Selection of Teaching Approaches

For presenting and practicing grammar in this study, the teaching approaches used were both deductive and inductive. However, the inductive teaching approach was used more on the basis of the following three reasons. Firstly, the subjects did not come from a very traditional educational background. They had been taught English in the decade of communicative approach, focusing on the teaching of language functions and uses through communicative activities (Educational Technique Department, 1991). They were not used to the grammar-translation approach which makes use of the deductive method. Hence, these students might find learning grammar through the deductive approach more stressful than the inductive approach. Secondly, the subjects were in M.4 – they were not high level experienced learners. The inductive method might be more appropriate for them. Finally, since each grammatical item taught in the experiment was not complex and the inductive approach works better with regular grammatical patterns, the students could easily perceive it through the use of the inductive method with approximately 2 to 3 periods of 50 minutes.

2.3 Construction of the Research Instruments

This section describes the construction of the research instruments used in this study. They are the teaching materials, teaching plans, test of grammatical competence, and questionnaire on attitudes towards learning grammar through games.

2.3.1   Teaching Materials

The construction of teaching materials includes the selection of four grammatical items to be taught, games for the experimental group, and non-game activities for the control group.

2.3.1.1 Four Grammatical Items to Be Taught

The four grammatical items to be taught were "past events" *(past simple with ago and for)*, "experiences" *(present perfect with ever and never)*, "necessity" *(has/have to, have/has got to)*, and "rules and permission" *(can, must, be allowed/ permitted/ forbidden)*. Students were required to be able to communicate in these four grammatical areas. These four grammatical items were selected by the following procedures. The investigator firstly listed grammatical items for the English course syllabus of M.4 level. The checklist (see **Appendix A**) was checked out by 20 M.4 English teachers in Woranareechaloem, Mahavajiravudh, and Nawaminthrachuthit Taksin, the secondary schools in Amphur Muang, Songkhla Province, to indicate (1) the grammatical items that their students had the most problems with and (2) the grammatical points that were important and necessary for their students to successfully study English at M.4 level. The grammatical items indicated by those 20 teachers as problematic and necessary for the study of English in M.4 level were present simple tense, present continuous tense, present perfect tense, past simple tense, past continuous tense, future tense, auxiliary verb, article, active and passive voice, relative clause, present and past participial, direct and indirect speech, adjective and adverb, tag question and wh-question. The verb tense and auxiliary verb were indicated as the main problems to students. Finally, only four grammatical items: (1) *present perfect with ever* and *never* (2) *has/have to, have/has got to* (3) *can, must, be allowed/ permitted/ forbidden* (4) *past simple with ago* and

for, which were included in the content of the English course (Eng. 012) of the second semester were selected so that the experiment would not disturb the subjects' normal process of study.

2.3.1.2 Games for the Experimental Group

Linguistic and communication games were used in the process of teaching with the experimental groups. The investigator firstly selected and adapted eleven games. Four of them were linguistic games and seven were communication games. Secondly, ten out of eleven games were selected for the pilot study. These games were tried out with three classes of M.4 students at NMT School who took the same course as the research subjects but were not involved in the main study. The main purpose of the pilot study was to find out the suitability of each game in terms of instructional process and management. Each game was tried out once. The summary of the piloted games is shown in Table 4.

Table 4 Summary of the Piloted Games

Class	Grammatical Contents	Game Names	Types of Games	
			Linguistic	**Communication**
4/1	Experience	Verb game	☆	
		Find-Someone-Who		☆
4/3	Necessity	Chain game	☆	
		Role Play		☆
	Rules & permission	Card game	☆	
		Find-The-Differences		☆
		Role Card		☆
4/5	Past events	Breakdown game	☆	
		Complete-It		☆
		Interview		☆

After the tryout, the instructional process and management of each game were adjusted as follows. (1) The game instruction was given in Thai after it was explained in English so as to make sure that every student knew what they were asked to do because in the tryout the students had difficulties in understanding the English instruction. (2) The Role Card game was not used because it took too long time and the students could not complete it in the available time. (3) When the students were playing the games requiring pair work, the teacher had to make sure that the students did not take a look at their partner' s worksheet so that the information gaps made them feel the needs to communicate and practice using the language themselves. (4) The teacher was to organize the class in a way that facilitated game playing and to plan the instructional process effectively in order to finish the game in time.

Finally, nine games - four linguistic and five communication- were selected for the experiment at different stages of grammar teaching. Linguistic games were used at the practice stage and communication games were used at the production stage. The selected games for the main study are shown in Table 5.

Table 5 Selected Games Used in the Main Study

Linguistic Games	Communication Games
1. Verb game	1. Find-Someone-Who
2. Chain game	2. Role Play
3. Card game	3. Find-The-Differences
4. Breakdown game	4. Complete-It
	5. Interview

2.3.1.3 Non-Game Activities for the Control Group

Non-game activities were used with the control group in the practice and production stages. The learning activities moved from more to less controlled. The activities required students to work both in pairs and in small groups. The students were given opportunities to practice and produce grammatical points through various language activities but games.

2.3.2 Teaching Plans

The teaching plans for both the control and experimental groups were written by the investigator, and they followed the Three Ps procedure: presentation, practice and production stages. The grammatical item to be taught was presented to both groups in the same procedure of the presentation stage. However, at the practice stage the experimental group practiced the newly learnt grammatical item through linguistic games and they were exposed to grammar use at the production stage through communication games. On the other hand, the control group did the non-games activities in the practice and production stages.

2.3.2.1 Three Ps Teaching Stages

The principles of the Three Ps teaching stages were applied to each unit of the two lesson plans used in this study. This study was to compare the effectiveness between two teaching methods: teaching grammar through games and through non-game activities. However, each teaching method followed the same teaching stages as follows.

2.3.2.1.1 Presentation Stage

At this stage, a model text containing new grammatical items was introduced to students through various means such as a reading text, a conversation from a cassette tape. The purpose of the presentation stage was to get students to perceive the grammatical structure – its forms and meaning. The meaning was explained or demonstrated and other necessary information was presented. The teacher worked with controlled techniques; she both selected the language items the students were to use and asked for the accurate reproduction of new language items. The teacher insisted on accuracy; she corrected where the students made mistakes. The teacher acted as a classroom presenter. Both inductive and deductive approaches were used but more inductive approach was emphasized at this stage.

2.3.2.1.2 Practice Stage

At the practice stage, the newly presented grammatical item was practiced, either individually, in pairs or in groups. The teacher elicited the model sentence from the students and gave the students opportunities to start producing the language on their own. The practice activities used at this stage were less teacher-centered and moved from more controlled to less controlled practices. During the practice stage, the teacher intervened as necessary to guide and to spot an inaccuracy. She acted as a classroom conductor. The corrections were both teacher' s correction and student' s self-correction.

2.3.2.1.3 Production Stage

At this stage, the students were to produce the newly learnt grammatical item in a freer and more flexible way with more confidence. They were provided with opportunities to use the language in uncontrolled activities which were modeled on those of real life e.g. give instructions, solve a problem. At this stage, the students were ready to try using language more independently of the teacher. They interacted individually, in pairs or in small groups. The production activities were student-centered. The teacher acted as an adviser, facilitator, motivator, or language resource informant. She monitored group-work and helped the students only when needed. There was little or no correction from a teacher at the production stage.

2.3.2.2 Two Types of Activities to Enhance Grammatical Competence

Two types of activities to enhance grammatical competence in this study: game-based activities and non-game activities, were described in this section.

2.3.2.2.1 Game-Based Activities

The game-based activities were used with the experimental group. Linguistic and communication games were presented at two different stages of grammar teaching. Linguistic games were used at the practice stage to enable students to establish their grammar accuracy. At this stage, students were helped to recognize and internalize the language forms through the repetition practice

in playing linguistic games. Communication games were utilized at the production stage. At this stage, students were offered opportunities to use the grammar they had newly learnt to communicate. Therefore, the communication games served as a freer or more flexible way of language use at this stage. Fluency in language use and completion of tasks were concentrated on at this stage rather than the language form.

2.3.2.2.2   Non-Game Activities

Non-game activities were used with the control group. The activities were done either individually, in pairs or in groups. At practice and production stages of grammar teaching, the learning activities moved from more to less controlled. The students were required to practice the language form through four skills: listening, speaking, reading, and writing.

However, these two types of activities: game and non-game were used after the stage of presentation. That is, the experimental group practiced each grammatical item through linguistic games at the practice stage and communication games at the production stage, while the control group practiced each grammatical item through non-game activities at both practice and production stages. The differences between game-based and non-game activities at each stage of grammar teaching for the control and experimental groups are presented in Table 6.

Table 6 Activities for Different Stages of Grammar Teaching Between the Two Groups

Stages of Grammar Teaching	Subjects	
	Control Group	Experimental Group
1. Presentation	Awareness raising activities, eliciting, etc.	Awareness raising activities, eliciting, etc.
2. Practice	Non-game activities (more controlled activities)	Linguistic games
3. Production	Non-game activities (less controlled activities)	Communication games

2.3.3 Test of Grammatical Competence

The test was composed of 25 multiple-choice items, each with four alternatives. The construction of the grammatical competence test was carried out as follows.

1) The test of 35 multiple choice items (with four alternatives), covering the four target grammatical items, was constructed by the investigator. It was then reviewed and revised, and finally proofread by an English native speaker.

2) The test was tried out at NMT School with 78 science program M.4 students who were not involved in the main study on 3rd January, 2001 . The time allotment for the test was 45 minutes.

3) All 35 items were scored and statistically analyzed, using a 33% technique in view of the small number of the test takers. Therefore, there were 26 test takers in the top group and 26 test takers in the bottom group.

4) To analyze the test, each item was calculated for item facility value (F.V.), and the item discriminability index (D.I.). The whole test was then calculated for the mean ($\overline{X}$), standard deviation (S.D.), and reliability (R_{tt}). The statistical information from the pilot of the test is shown in Table 7.

Table 7 Pilot Study Results of the Test of Grammatical Competence

No. of Test Takers	No. of Items	Highest Possible Score	$\overline{X}$	S.D.	KR$_{20}$ R_{tt}
78	35	35	11.31	2.61	.72

5) According to Nuttal and Skurnik (1969) cited in U-sa Keenardputta (1999), Heaton (1988), and Alderson et al. (1995), the test items with the item facility values

between 0.20 and 0.80 and with the item discriminability index 0.20 were accepted. Thus, ten items of the test which did not meet these criteria were deleted and the rest 25 acceptable test items were retained for the final version of the test for the main study (see **Appendix B**). Table 8 demonstrates the description of the test of grammatical competence used in the main study.

Table 8 Description of the test of grammatical competence

Contents	Grammatical Items	No. of Test Items
Experience	Present perfect with *ever* and *never*	6
Necessity	*Has/have to, have/has got to*	5
Rules and Permission	*Can, must, be allowed/ permitted/ forbidden*	8
Past Events	Past simple with *ago* and *for*	6

2.3.4 Questionnaire on Attitudes Towards Learning Grammar Through Games

This semi-structured questionnaire was adapted from Chantisa Chanprasert (1998). The questionnaire for the present study consisted of two parts. The first part contained eighteen items of the five-point rating scale (a Likert-type attitude scale). The second part had three open-ended questions. The questionnaire was administered to the experimental group after they finished the post-test. The purpose of this questionnaire was to investigate the students' opinions and attitudes towards the use of games in learning grammar (see **Appendix C**). The questionnaire of which levels of agreement vary from 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree), to 1 (strongly disagree), had the reliability index of .94. The content of the questionnaire was categorized into three parts surveying the following areas:

1) Attitudes towards learning grammar through games (items 1-9)

2) Attitudes towards learning English in general through games (items 10-13)

3) Attitudes towards game playing in language learning (14-21)

3. Data Collection

The steps of data collection were described as follows.

1) The test of grammatical competence was administered as a pre-test to both experimental and control groups to investigate the subjects' prior knowledge of the four target grammatical items. The pre-test was conducted on Tuesday January 30th, 2001. The testing time lasted 25 minutes. The control group started from 9.30 a.m. to 9.55 a.m. and the experimental group started from 10.10 a.m. to 10.35 a.m. The students in the control group were kept in the class for 10 minutes after they finished the test to ensure that they would not discuss with the experimental group about the test.

2) The main experiment was conducted for two weeks: a total of 10 periods of 50 minutes for each group from Monday, February 5th to Monday, February 19th 2001. The two groups were taught four grammatical items: the past events (*past simple with ago and for*), experiences (*present perfect with ever and never*), necessity (*has/ have to, have/ has got to*), and rules and permission (*can, must, be allowed/ permitted/ forbidden*) by the investigator using different teaching methods: using game-based and non-game activities (see section 2.3.2.2 on page 38).

3) The post-test was administered to both groups on Tuesday February 20th 2001. The test time was 25 minutes. The control group started from 9.30 a.m. to 9.55 a.m. and the experimental group started from 10.15 a.m. to 10.40 a.m.

4) The questionnaires on students' attitudes towards learning grammar through games were distributed to the experimental group and then collected by the investigator after they finished the post-test.

4. Data Analysis

In this study, there were two main variables. The independent variables were two teaching methods: teaching grammar through games and through non-game activities. The dependent variables are scores on the pre- and post-tests of grammatical competence test of both groups and attitudes towards learning grammar through games of the experimental group.

The data in this study were analyzed using the following methods.

4.1 To answer the first research question asking what the effects of using linguistic and communication games on students' grammatical competence were, the means and standard deviations of scores on the pre- and post-tests of grammatical competence of both groups were compared using a t-test to determine whether they were significantly different from each other or not. The data was computed using an SPSS/PC (Statistical Package for the Social Sciences) program.

4.2 To answer the second research question asking what the students' attitudes towards learning grammar through games were, the analysis of the experimental group's responses to the semi-structured questionnaire was divided into two parts.

4.2.1 The data derived from the five-point rating scale in the first part were calculated for means and standard deviations using an SPSS/PC program. The ranges of the mean score of each level used for interpreting the level of agreement (Pojaman, 1988: 34) are shown in Table 9.

Table 9 Criteria for Rating Scale Interpretation

Ranges of the Total Mean Value ($\overline{X}$)	Interpretation of Preference	Levels of Agreement
1.00-1.80	Least	Strongly disagree
1.81-2.60	Slightly	Disagree
2.61-3.40	Moderate	Uncertain
3.41-4.20	Much	Agree
4.21-5.00	Most	Strongly agree

4.2.2 The data obtained from the open-ended questions in the second part were recorded and grouped according to similarity of the students' responses. They then were tallied for frequency and finally calculated for percentages. Table 10 summarizes how the research data were analyzed.

Table 10 Data Analysis

Research Questions	Research Instruments	Statistical Devices
1. Is the grammatical competence of the students studying through games better than that of the students studying through non-game activities?	1. Pre- and post-tests	T-test
2. What are the students' attitudes towards : a) learning grammar through games, b) learning English in general through games, and c) game playing in language learning?	2. Questionnaire 2.1 Five-point rating scale questions 2.2 Open-ended questions	Mean value ($\overline{X}$) Percentage