

CHAPTER III

RESEARCH DESIGN AND PROCEDURE

The research design of this study was a pure experimental type conducted in Writing I course at KMITNB in order to study the effects of the three different types of peer feedback (paper-pencil, e-mail, and web board) and three levels of students' general English proficiency (high, moderate and low proficiency) on the students' writing achievement. In addition, it also investigated the students' attitudes toward the peer feedback they experienced.

Therefore, there were three groups of students who were exposed to different types of feedback which were paper-pencil peer feedback, e-mail peer feedback, and web board peer feedback throughout the semester 1, academic year 2007. All of the three groups were equally trained for the peer feedback revision twice at the beginning of the course. In order to achieve the research objectives both quantitative and descriptive methods were used to analyze the data, and they are discussed later in the subsequent parts.

This chapter draws an overview of the research design for the present study. This includes the details of population and samples, the method of sample selection, settings, research instruments, and the peer feedback methods. It also describes data collection procedures and data analyses.

3.1 Research Design

The design of this study was claimed as pure experimental research because random selection and random assignment were adopted. This research aimed to investigate the main and interaction effects of the two independent variables on dependent variable. Each independent variable had three levels, so each cell was composed of 10 students. As a result, this study had a 3*3 factorial design which comprised 9 experimental groups, i.e. paper-pencil peer feedback with high proficiency, e-mail peer feedback with high proficiency, and web board peer feedback with high proficiency. Table 3.1 illustrates the research design of this study.

Table 3.1: Research design

Levels of students' proficiency	Types of peer feedback treatment		
	Group 1:	Group 2:	Group 3:
	Paper-pencil (X1)	E-mail (X2)	Web board (X3)
High proficiency (Y1)	10	10	10
Moderate proficiency (Y2)	10	10	10
Low proficiency (Y3)	10	10	10
Total	30	30	30

3.2 Population and Samples

The population was 146 Thai second year undergraduate Engineering students who enrolled in Writing I as an elective course at KMITNB in the first semester of academic year 2007, but the samples of this study were composed of 90 students. The students' age range was 19-25, 69 males and 21 females. All of them had taken Foundation English I and II with different levels of general English proficiency. Moreover, it was assumed that the students had the same level of computer literacy skills in particular using the Internet browser and e-mail from the computer application course required in their first year. This assumption was asserted to confirm their ability to effectively use the e-mail and web board applied in this study.

3.3.1 Subject Selection

Stratified random sampling technique was used in this study for the subject selection from the 146 population. According to their English I and II total raw scores, they were classified into 3 levels of proficiency which were categorized by percentile rank as shown in Table 3.2 (Appendix A).

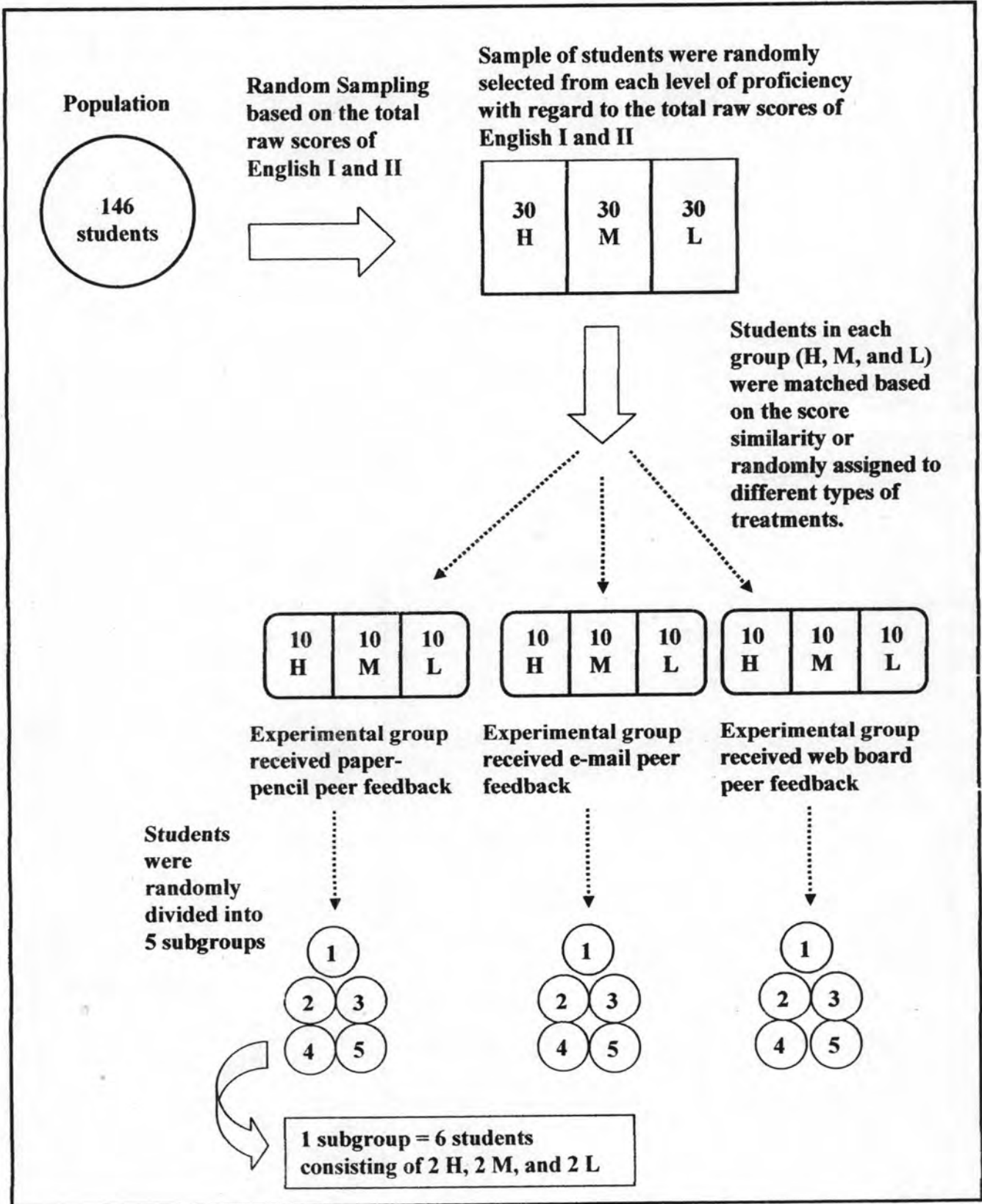
Table 3.2: The percentile rank of total English I and II raw scores of the population

Percentile	Scores	Number of students	Levels
75	147.5	33	High
60	136	33	Moderate
40	124		
25	112	34	Low

Table 3.2 shows the percentile rank of English I and II raw scores of the population for the subject selection. There were 33 high proficiency learners (whose scores were above the 75th percentile or above 147.5 scores), 33 moderate proficiency learners (whose scores were between 40-60th percentile or 124-136 scores) and 34 low proficiency learners (whose scores were lower than the 25th percentile or 112 scores). Thereafter, 30 students were randomly selected from high proficiency group, 30 students from moderate proficiency group and 30 students from low proficiency group. The students with the similar scores were matched. For the students whose scores could not be matched or their scores could be matched but no matchee left for them, they were randomly assigned by drawing from their student identification numbers to paper-and pencil peer feedback group, e-mail peer feedback group or web board peer feedback group. In each group, students were divided into 5 subgroups. Moreover, each subgroup was composed of 6 students- 2 low proficiency learners, 2 moderate proficiency learners and 2 high proficiency learners. The details of subject selection are shown in Figure 3.1.

The arrangement of 6 students with different general English proficiency levels in each subgroup was due to the fact that students would possibly have the benefits of additional comments and points of view from a wider audience.

Figure 3.1: Procedures for subject selection



3.3.2 Subject Compatibility

In order to assure that before receiving different types of peer feedback the 3 groups of students were homogenous in terms of general English proficiency, the following steps were implemented. Table 3.3 illustrates the method of subject comparability in the study.

Table 3.3: Subject comparability method

Levels of students' proficiency	Types of peer feedback treatment			
	Group 1: Paper-pencil peer feedback	Group 2: E-mail peer feedback	Group 3: Web board peer feedback	
High-proficiency	10	10	10	One-way ANOVA
Mid-proficiency	10	10	10	One-way ANOVA
Low-proficiency	10	10	10	One-way ANOVA
Total	30	30	30	One-way ANOVA

1. The subjects were classified into 3 levels of general English proficiency based on their total raw scores of English I and II shown in Table 3.2.
2. To increase confidence that the students in the 3 groups of experiments were statistically comparable, a mechanical matching design with random assignment (Fraenkel and Wallen, 2000) was utilized.
3. Horizontally, to ensure that the students in each peer feedback group in the high, moderate and low proficiency levels are comparable in terms of their high, moderate and low proficiency, one way analysis of variance (ANOVA) was used if

the scores meet the basic assumptions of normal distribution and homogeneity of variances. The results from the normality tests, Shapiro-Wilk ($n \leq 50$), showed that the scores of the students in the high and the low proficiency groups yielded normal distribution and equal variance. As a result, one-way ANOVA was used to compare the mean differences. In contrast, the scores of the moderate proficiency groups violated the two basic assumptions, so non-parametric Kruskal-Wallis Test was used instead (Kinnear and Gray, 2000). The statistical results of the subject compatibility of high, moderate, and low proficiency groups are shown in Appendix B.

4. It could be concluded from the results that each level of proficiency group in the 3 experimental groups was also comparable in terms of their high, moderate and low proficiency levels.
5. Vertically, to be certain that the students in the 3 groups were homogenous in terms of their general English proficiency before receiving different types of peer feedback, Kruskal-Wallis test was used to compare the mean scores of the 3 groups because the normality and homogeneity of variance of the subjects violated basic assumption. It was found that no significant difference among the groups was revealed, $Chi-Square = 0.04 (2)$, $p = 0.998$ (see Appendix B). It could be inferred that any difference that might occur would be from the treatment only.

3.3. Setting

The study took place at King Mongkut's Institute of Technology North Bangkok (KMITNB), located at 1518 Pibulsongkram Road, Bang Sue District, Bangkok 10800, Thailand. At KMITNB, Writing I is an elective course in the undergraduate Engineering curriculum. Due to the different treatments, the students in paper-pencil peer feedback group took the class in a normal air conditioned classroom with provided facilities needed in a writing course such as dictionaries, grammar textbooks, whiteboard and overhead projector. On the other hand, the students in the other two groups received peer feedback from e-mail and web board were in the computer lab. They could use the computer lab beyond the class time as well. However, it was noted that the students certainly had the same classroom environments, and they were also taught by the same teacher.

3.4 Writing I Course

The objective of the course was to enhance the students writing ability in a variety of paragraph types such as narrating an event, describing a process, listing characteristics of a person or thing, and giving reasons and examples. Moreover, the course also focused on the selection of appropriate words/vocabulary for specific contexts and logical/chronological order, writing sentences of various structures as well as writing process. The class duration was 3 hours, once a week over the period of 15 weeks, during the class time, the instruction focused on process writing such as brainstorming, writing drafts, revision and editing. Both fluency and accuracy received equal attention as well as good quality of writing. Importantly, the researcher acted as an instructor for the 3 sections. Moreover, the text books, reading passages, writing assignments, activities in the classroom, and grading rubrics were the same in all 3 experimental groups.

3.5 Peer Feedback Training

According to many previous studies on peer feedback (McGroarty & Zhu, 1997; Mangelsdorf & Schlumberger, 1992; Hui-TzuMin, 2005), it is necessary for teachers to train students for the successful peer review techniques and to construct opportunities for effective peer interactions. In this research the students were trained how to provide good quality comments on their friends' paper in weeks 2 and 3 of the course for 6 hours by applying the Four Training Steps for Peer Feedback Training illustrated below, using Guidance sheet for Peer Revision Training (see more details of peer feedback training in **Appendix C**).

Table 3.4: Four training steps for peer feedback training (Hui -TzuMin, 2005)

Step	Definitions
1. Clarifying the writer's intention	Reviewers try to get further explanation of what writers have said or what is not clear to them in the essays (e.g., an unknown term, an idea).
2. Identifying the problem	Reviewers announce a problematic word, phrase, sentence or cohesive gap.
3. Explaining the nature of the problem	Reviewers explain why they think a given term, idea, or organization is unclear or problematic, which should or should not be used in the essay.
4. Making specific suggestions	Reviewers suggest ways to change the words, content, and organization of essays.

Moreover, to ensure the quality of their feedback given to their friends and their ability to distinguish between the helpful and not so helpful comments from their peers, group consultations were arranged outside class time at the beginning of the experiment, at least 2 times for each subgroup or 30 minutes/ time. Besides, at every step in the training, the goal of the peer feedback activity was emphasized, and the students were encouraged to believe that they could trust their peers' group assistance.

3.6 Peer Feedback Method

The students in the three groups had to write four in-class essays during the week 2nd to 11th. In order to ensure that the students seriously put their effort, and did their best in providing feedback, 25 % of the final course grade was assigned on peer feedback activity including a transcript of a message uploaded from the e-mail in the e-mail peer feedback group, a message uploaded from web board discussion in the web board peer feedback group, and papers with peer comments from the paper-pencil peer feedback group. 10 % of the grade was for participation and attendance. As Melzer (2006) suggested that to build in some measure of peer feedback accountability, a teacher should collect responses and give them a holistic score, or ask students to evaluate their peers' responses and grade them. Therefore, the students had to hand in or send their feedback to the teachers as well. Moreover, the quality of feedback was rated by a 3-point scale where 3 = relevant and specific comments, 2 = relevant but general comments and 1 = irrelevant or inaccurate comments (adapted from McGroarty and Zhu, 1997). As a result,

the teacher's monitoring and the assigned credits on their given feedback would enhance the quality of peer feedback in some degrees.

1. *In the paper-pencil peer feedback group*, the students wrote the essay in the classroom and then submitted it to the teacher at the end of that session. The essays were copied and assigned to the students who were in the same subgroup (six students - 2 high proficiency learners, 2 moderate proficiency learners and 2 low proficiency learners in a subgroup). Each student was assigned to give feedback on five papers of their group members by the following peer feedback guidelines (see Appendix D) constructed by the researcher. The purpose of the guidelines was to help students to focus their attention on relevant issues or particular areas they should look for and comment on. They had one week to do the task before returning their friends' papers. After the students received the papers back from their peers, they had a weekend to revise their first draft outside the classroom before submitting the second draft to the teacher with the attachment of the peer feedback within the due date. Next, the teacher provided feedback on the students' second drafts using the same form of peer feedback guideline. After that they revised and then submitted the final product to the teacher within the due date.

2. Similar to the paper-pencil peer feedback group, the students in *the e-mail peer feedback group* wrote the essays by using the computer in the classroom and then e-mailed their papers to their friends in the same subgroup in the same way as what the paper-pencil peer feedback did. They also sent an e-mail to the teacher with an attachment of their papers at the end of that session. In this way, each student was assigned to give feedback on five papers of their subgroup members by following peer feedback guidelines. They had one week to finish the task, and then they had to e-mail their feedback to their friends and teachers before the next session. After the students received feedback from their peers, they had a weekend to revise their first draft outside the classroom before submitting the second draft to the teacher with the attachment of the peer feedback within the due date. Next, the teacher provided feedback on the students' second drafts using the same form of peer feedback guidelines. After that they had to revise and then submitted the final product to the teacher within the due date. All the tasks were carried out via e-mail.

3. For *the web board peer feedback group*, the data-based driven website for posting the peer feedback was constructed to collect all the essays and responses from the students. On the web board, the students could read and post the essay and comments to other friends in the same subgroup anonymously, but the teacher who was the web master had an authority to know who the feedback responders were but not the owner of the essay. It is believed that the anonymity of the commentators yields more honest feedback and provides non-threatening and a non-judgmental environment. In this respect, this web board peer feedback group was different from the e-mail and paper-pencil peer feedback group in that each student knew who provided feedback to her or him. Like the other two groups, the students had to write the essay by using the computer in the classroom and then posted their papers on the web board at the website addressed www.annycfe.com. Therefore, by visiting the given website each student was assigned to give feedback on five papers of his or her friends who were in the same subgroup by using the peer feedback guidelines which could be downloaded from the website. They had one week to do the task and they had to post their feedback to their friends before the next session. After the students received feedback from their peers, they had a weekend to revise their first draft outside the classroom before the submission of the second draft to the teacher within the due date. Next, the teacher provided feedback on the students' second drafts using the same form of peer feedback guidelines. After that they had to revise, and then submitted the final product to the teacher within the due date. All the tasks were carried out through the web board.

3.7 A Teacher's Role

It is noted that the teacher played a role as a facilitator who helped the students to learn and at the same time she had to facilitate active interaction between learners during the writing process. She took a role as consultant, and resource in the teacher-students conferencing. She was a coach in the students' training session, and she could also function as a moderator to check whether the students were on the right track in the electronic peer feedback activities, and encouraged learners to take responsibility for their own learning. She also acted as a conductor at the beginning who led the class discussion.

3.8 Research Instruments

The following instruments were used to collect the data in this study:

1. Writing Achievement Test

This writing achievement test was constructed by the researcher which was distributed at the end of the study. The purpose of the test is to assess the students' achievement in writing after the experiment. The test content is in accordance with the objectives of the course. More in-depth details of the test development are shown in Appendix E, and the test is in Appendix F.

The test comprises 3 main parts. The first two parts intend to measure the student's knowledge and recognition on the grammatical points taught in the course. In part 1, the students have to correct 20 underlined errors which might be a word or phrase. In part 2, there are incomplete sentences with four multiple alternatives provided. The students have to select the one word or phrase that best completes the sentence. There are 15 items. The third part is composed of 3 types of paragraph writing taught in the class which are description, process, and giving reasons and examples. The students had to complete all the test tasks within 3 hours.

Actually, there is no problem in marking the first two parts which have one correct answer because each item has only one correct answer which is worth one point. They can be scored by the researcher without any guidance or help from others. For the part of paragraph writing, the assessment criteria for writing are based on Jacobs et al.'s (1981) scoring profile (cited in Hughes, 2003). The profile is divided into five major writing components: content, organization, vocabulary, language use and mechanics with each one having four rating levels, namely, *excellent to very good*, *good to average*, *fair to poor* and *very poor*. The analytic scoring is applied as the rubric of evaluation due to its outstanding usefulness, high validity and washback (Hyland, 2003). Moreover, it corresponds to the purpose of the test which is to measure the student's overall writing ability in 5 major writing components to the course's objectives.

According to the writing section, the scoring was done independently by two raters (the researcher and a well-trained research assistant) with a third rater judgment in cases of discrepancy of the scores. To ensure the raters use the same standard in scoring as well as defining what is meant by phrases in the rubric, examples of writing were given to the raters for having a discussion about each piece of work and how it should be

rated. Finally, after they reached the finalized consensus for each piece of work, they scored the writing part independently. Pearson product-moment correlation coefficient was used to calculate inter-rater reliability, and the acceptable value should not be less than 0.75 (Sukamolson, 1995).

Validation Process

In order to ensure the content validity of the test, three experts were asked to examine the objectives of the test items by providing them a checklist marking agreement, disagreement or questionable items. After that it was calculated by Item Congruence Index (IOC), and the acceptable value of each test item should not be lower than 0.75. Overall, the result showed that the content validity was 1 (see Appendix G).

Three experts involved in the process are highly experienced English language teachers whose specialization is in writing instruction in EFL/ESL contexts, linguistics and assessment respectively (see Appendix H). Moreover, they have at least 10 years of teaching experience in the field.

The Trials of the Test

1. Before the test was used in the main experiment, the test was pre-tested with 5 test takers to get the preliminary information whether the instruction was clear, and how long it took them to complete the test.
2. Next, the pilot testing was conducted with 105 KMITNB second year engineering students who had similar characteristics with the subjects of the study. CTIA/Grading or Classical Test Item Analysis and Grading (Sukamolson, 1995) was used to analyze the test items. The items of which difficulty index ranging between 0.20 and 0.8 and discrimination index is equal to or higher than 0.3 were chosen for the main study due to heterogeneous groups of the students (Sukamolson, 2005). Moreover, the appropriateness of the test was evaluated by the instructors teaching Writing I at KMITNB in accordance with the feedback received from the students. The result of the item analysis showed that on average the difficulty index was 0.66, and the discrimination index was 0.54 (see Appendix I).

3. For the reliability of 3 subjective test items, one language teacher and the researcher rated 30 students' papers by using the Jacob et al's scoring profile (1980). According to SPSS, inter-rater reliability measured by Pearson Product between the first and second rater was 0.90 and 0.98 in the pilot and the experimental study respectively. The test reliability calculated by Cronbach's Alpha Coefficient was 0.94, and the difficulty index and discrimination index of the test items estimated by Scannell and Tracy's formula (1975, cited in Sukamolson, 2005) were presented in table 3.5.

Table 3.5: The Difficulty Index and Discrimination Index of the Subjective Test Items

Items	Difficulty Index	Discrimination Index
1. Describing picture	0.55	0.75
2. Writing manufacturing process	0.58	0.57
3. Giving reasons and examples	0.52	0.64
Average	0.55	0.65

4. The reliability coefficient of the objective test items calculated by using Kuder-Richardson (KR21) was 0.76 while the reliability of the subjective test items calculated by using Cronbach Alpha coefficient was 0.94.
5. The good items were utilized while the poor items were revised or deleted.

2. Attitude Questionnaire

Again, this part focuses on the development of attitude questionnaires and interview. The construction of the questions was based on the literature reviews (Chinnawongs, 2001 and Padgate, 2001), previous research on the benefits of peer feedback and the advantages of integration of technology in peer feedback method. Moreover, in order to construct the instruments effectively, questionnaire checklist and interview checklist (Sukamolson, 2001) shown in **Appendix J**, were consulted as the main consideration in performing the tasks. The questionnaire itself is shown in **Appendix K**.

engineering students participating in different types of peer feedback groups. In order to reach the same understanding, the questionnaires were translated into Thai before being administered with the students.

The questionnaire consists of 2 main parts. The first part asks about the students' personal information and the other asks their attitudes towards peer feedback they experienced in the writing course on six main aspects for 55 statements as shown in Table 3.6, and two open ended questions (items 56 and 57). In the second part, the students were asked to rate the degree of agreement on each item, the rating criteria are a five point Likert scales:

- 5 = Strongly Agree
- 4 = Agree
- 3 = Neutral
- 2 = Disagree
- 1 = Strongly Disagree

The evaluation criteria of the questionnaire are as follows:

0.00-1.50 means positive attitude towards peer feedback was very low.

1.51-2.50 means positive attitude towards peer feedback was low.

2.51-3.50 means positive attitude towards peer feedback was moderate.

3.51-4.50 means positive attitude towards peer feedback was high.

4.51-5.00 means positive attitude towards peer feedback was very high

Table 3.6: The six aspects of attitude measurement (close-ended type of questionnaire)

Headings	Total statement	Positive statement	Negative statement
1. Attitudes toward peer feedback method in general	14	9	5
2. Attitudes toward peer groups	8	6	2
3. Attitudes toward the benefits of peer feedback as a reader	7	6	1

Headings	Total statement	Positive statement	Negative statement
4. Attitudes toward the problems of using peer feedback as a reader	10	6	4
5. Attitudes toward the benefits of peer feedback as a writer	9	7	2
6. Attitudes toward the problems of using peer feedback as a writer	7	4	3
Total	55	38	17

Validation of the Questionnaire

The conformation of item contents and objectives of the questionnaire were evaluated by three experts by using a checklist marking agreement, disagreement or questionable items. Afterward, Item Congruence Index (IOC) was used to calculate its content validity in accordance with the experts' comments. The results showed that all of the experts agreed upon the content of every statement, and the value of IOC value was 1.00.

The Trials of the Questionnaire

The questionnaire was administered with 56 KMITNB second year engineering students. Cronbach Alpha coefficient by SPSS version 11.5 was used to calculate internal consistency reliability of each item. The analysis indicated that the reliability value was 0.79 which was acceptable (Sukamolson, 1995), so it could be used in the experiment (Appendix L).

3. Interview

The interview was conducted in order to collect more in-depth students' reflections, preferences, attitudes, opinions, and feelings towards peer feedback they received. The following procedures are recommended for the interview development (Nunan, 2001), and the plan of conducting the session is described below.

1. **Preparing the interview schedule and considering question format and response mode:** The interview was semi-structured type of which topics and issues were specified in advance (**Appendix M**). Most of the questions were derived from the questionnaire part, but the interview was conducted to gain more insight into the issues and being used to triangulate the data received from the students as well.
2. **Piloting with a small sample of subjects before being used:** This provides the researcher the opportunity to find out the questions yielding the kinds of data required and to eliminate any ambiguous or confusing questions. It is noted that the validation process is the same as the questionnaire development. The findings indicated that the content validity or IOC value of the interview was 1.00, which means that all the three experts agreed with all the content of the interview items.
3. **Selection of subjects:** For the main study, three high proficiency learners, three moderate proficiency learners and three low proficiency learners in each peer feedback group were randomly selected and assigned to the interview section systematically, so the total students were 27.
4. **Elements of the interview:** This includes briefing and explaining about the nature of research and purpose of the interview before the questioning stage. The interview was conducted at the end of the course out of class and tape recorded.

Finally, the data received from the interview was transcribed and then categorized, analyzed and interpreted. More details of the interview analysis procedure were provided in the Qualitative Data Analysis part.

4. Learning Log

Another form of self-assessment in writing is a learning log (Pradle and Mayher 1985; Atwell 1990; Jan 1992). Learning logs and journals are useful methods for assessing student progress. They are formative forms of evaluation and assessment. The most valuable is that they assist the learning process, encourage student thinking and give students the chance to reflect on what they are studying, to record thought, questions,

ideas, and hunches (O'Malley, 1996). They can help students' self evaluation in documenting the progress they are making in learning, in writing or understanding new concepts, and in identifying a plan to improve learning. Many people have found reflections to be helpful for their self-development, and they turn behaviors and reactions become visible.

The differences between journals and learning logs are that the former are free flowing, subjective relying on opinion and personal experience, while the latter are concise, objective, factual and impersonal in tone.

In the study of the effects of different types of peer feedback, a learning log was used in an effort to triangulate data about students' attitudes, and feelings toward peer feedback and learning process. Questions in the learning log were designed on the basis of the objectives shown in Table 3.7. These questions made students aware of the problematic aspects or achievement of progress in their writing and problems and advantages of peer feedback method throughout the semester after they finished writing a second draft. The students had to write the learning log four times in accordance with the total number of assigned writing tasks throughout the experiment. They were allowed to write in Thai. In order to receive the relevant data, the guided topics were provided. The form of a learning log and its questions were constructed based on Brown (2004)'s guidelines of learning log development. It is shown in Appendix N. Furthermore, to ensure that the students understood what they had to do, the researcher explained in detail to students how to complete the log.

Table 3.7: The objectives and questions of the learning log

Objectives	Questions
1. To reflect their feelings and thoughts towards peer feedback as a writer and a reader (question 1 to 3).	1. What do you feel /think about peer feedback in this piece of work? As a writer..... As a reader.....
2. To self assess their learning process and achievement of writing skills (question 4 and 5).	2. What did you learn from peer feedback in this piece of work? As a writer..... As a reader.....

Objectives	Questions
	3. And what difficulties did you have in peer feedback method in this piece of work?
	As a writer.....
	As a reader.....
	4. What are you most and least confident in so far about your writing?
	5. What will you plan to do to write better?

Validation of the learning log

Three experts were asked to evaluate the content validity of the learner log like other research instruments. The findings indicated that the content validity or IOC value of the learner log was 1.00. It could be said that all the three experts agreed upon the appropriateness of the objectives and the questions in the learner log. After that it was piloted with a small sample of subjects before being used in order to ensure that the questions were clearly stated and understood.

5. Instructional Manual for Peer Feedback Training

The purpose of the instructional manual for peer feedback training was to provide details and guidelines for any instructor who would like to use peer feedback activity in their teaching. The purpose of training was to improve the quality of the comments the students had to respond to other peer's paper in order to ensure that they were able to give feedback to their peers effectively, and they understood how to use those comments to improve their works successfully. As a result, the manual was composed of information regarding instructional training materials, activities, teacher's role, students' role, and formative and summative assessment and evaluation (Appendix O).

It was noted that all the exercises, quizzes, small tests, material and training techniques were the same in the three experimental groups, but the difference was only the means and channel to provide and receive feedback. To ensure that the students

would truly understand what they had to do, the means of the task procedures were clearly described.

Validation of the Instructional Manual for Peer Feedback Training

The manual was evaluated by three experts in EFL in the following aspects; rational, conceptual underpinning, objectives, instructional techniques and activities and formative and summative assessment and evaluation. The evaluation form is composed of 2 parts: four point rating scales from Revise (1) to Excellent (4), and open-ended comments. Items score higher than 3 were reserved and those lower than 3 were modified and revised.

The Trials of the Instructional Manual for Peer Feedback Training

The manual was piloted with 20 students who shared the same characteristics with the subjects, and the efficiency of the manual (E1/E2) was calculated. The results showed that the value of the manual was 81/81 level (see details in Appendix P) which was higher than the acceptable value set at 75/75 (Kitrakarn, 2002). It means that the manual could be appropriately used in the main study.

In brief, to assure the quality of research instruments, all of them were validated by 3 experts in the EFL writing field. After that, they were piloted with the subjects who had similar characteristics to the samples participating in the main study. The following table illustrates the types of the instruments used in the study.

Table 3.8: Information of the instruments

Instrument	Objectives	Type of Instruments	Time of Distribution / Data Collection	Type of Data	Type of Analysis and Statistics Used
1. English Writing Achievement Test	- To compare the students' writing achievement in the three experimental groups	- Achievement test	- In class week 14	- Quantitative data	Quantitative analysis 1. Mean (\bar{x}), S.D. 2. Two way ANOVA (Inferential statistics)
2. Attitude Questionnaire (both in Thai and English version)	- To ask about the students' personal information and ask for their attitudes toward peer feedback they experienced in the writing course.	- Five point Likert scale (strongly agree to strongly disagree), questionnaire	- In class week 14	- Both quantitative and qualitative data	- Descriptive statistics (Mean and C.V.) - Qualitative analysis
3. Interview	- To study more in-depth students' reflections, preferences, attitudes, opinion, and feelings towards peer feedback they receive.	- Semi-structured interview	- Three high, 3 moderate, and 3 low proficient learners in each peer feedback group were randomly selected and assigned to the interview section systematically.	- Qualitative data	- Qualitative analysis

Instrument	Objectives	Type of Instruments	Time of Distribution / Data Collection	Type of Data	Type of Analysis and Statistics Used
4. Learning Log	- To study students' reflections, feelings, opinions, comments and suggestions to the peer feedback (they received throughout the semester). They were allowed to write in Thai.	- Open-ended questions	It is a semi-structured protocol, and it was carried on in week 15. - After they finished writing the second draft of each writing paper.	- Qualitative data	- Qualitative analysis
5. Instructional Manual for Peer Feedback Training	- To provide details and guidelines for the researcher or any instructors who would like to incorporate peer feedback in their classrooms.	- Manual for other teachers to use	- In weeks 2 and 3	- Quantitative data (scores)	- 75 /75 of Efficiency of Instructional Manual (E1/E2)

Moreover, the same lesson plan was used in the three groups, and the schedule of activities and tasks studied in each week is presented below:

Table 3.9: The lesson schedule

Week of class	Activities	Tasks
Week 1	- Informed course syllabus, explaining tasks and activities, essay writing rubric used for evaluation and course evaluation. - Group arrangement	
Week 2-3	- Peer feedback training and practicing - Unit 1: Introducing people	- Practiced how to give good comments by using sample papers. - In-class Essay 1 writing Type of writing: narrating an event - Students were assigned to give feedback to their group members' essays 1 as an assignment.
Week 4-5	- Unit 2: Writing Instruction	- In-class Essay 2 writing Type of writing: describing a process - Students were assigned to give feedback to their group members' essays 2 as an assignment.
Week 6-7	- Unit 3: Describing	- Prepare for the mid-term exam.
Week 8-9	- Unit 4: Listing Characteristics	- In-class Essay 3 writing Type of writing: listing characteristics of a person or thing - Students were assigned to give feedback to their group members' essays 3 as an assignment.
Week 10-11	- Unit 5: Stating Reasons and Using Examples	- In-class Essay 4 writing Type of writing: giving reasons - Students were assigned to give feedback to their group members' essays 4 as an assignment.
Week 12-13	- Unit 6: Expressing your Opinions	- Prepare for the final exam.
Week 14	- Made appointments for some students to attend the interview session.	- Took achievement test - Questionnaire completion
Week 15		- Interview session

3.9 Data Collection

1. In the first session, *week 1*, the students were informed which section and subgroups they belonged to, and they received the course syllabus and the details of tasks they had to do throughout the semester.
2. *During weeks 2- 3*, the students were trained how to produce a good quality of feedback to their friends, as well as practicing it through paper-pencil, e-mail and web board discussion in accordance with the group they belong to. In particular, the students in the e-mail peer feedback were asked to sign up for an e-mail account if they did not have it yet. Moreover, teacher-students conferences were arranged out of class time for 2 times. Each session took 30 minutes per session in order to ensure that the students could make use of peer comments and suggestion effectively.
3. From *week 2 to week 13*, the students had to write four essays in class, and revised the previous essay after receiving peer feedback. In the meantime, they had to hand in the learning log in class after they finished writing the second draft of each writing tasks. Moreover, the students had to hand in all the feedbacks received from their peers to the instructor, as well as the final draft after receiving and incorporating teacher feedback within the due date.
4. In *week 14*, the students had to take the achievement test, and the questionnaires were distributed at the end of the session.
5. Finally, in *week 15* nine students- 3 low proficient learners, 3 moderate proficient learners, and 3 high proficient learners, in each peer feedback group were randomly selected in systematic method for the interview session. Therefore, 27 students participated in the interview.

3.10 Data Analysis

3.9.1 To answer the research questions 1, 2 and 3, two-way ANOVA (F test) was used by employing SPSS/PC Version 11.5 to analyze the main effects and the interaction effect of different types of peer feedback and levels of students' general English proficiency. The results could probably be illustrated in Table 3.10.

Table 3.10: The mean scores of students' writing achievement test grouped by two factors – types of feedback and levels of achievement on students writing ability from the achievement test (R*C Notation)

Levels of students' general English Proficiency	Types of peer feedback treatment		
	Group 1: Paper-Pencil Peer Feedback (A1)	Group 2: E-mail Peer Feedback (A 2)	Group 3: Web board Peer feedback (A3)
High Proficiency (B1)	Mean scores on DV (A1B1)	Mean scores on DV (A2B1)	Mean scores on DV (A3B1)
Moderate Proficiency (B2)	Mean Scores on DV (A1B2)	Mean scores on DV (A2B2)	Mean scores on DV (A3B2)
Low Proficiency (B3)	Mean scores on DV (A1B3)	Mean scores on DV (A2B3)	Mean scores on DV (A3B3)

3.9.2 Since the main effects of the two independent variables were found, Scheffe's Test was performed to further examine the differences elicited in research question 1 and 2.

3.9.3 In order to calculate the effect sizes (ES) of the main effect of two independent variables (research question 1 and 2) and the interaction effect (research question 3), Eta squared, the proportion of the total variance that is attributed to an effect (Becker, 1999), was used to measure their effect sizes, and the magnitude of ES could be described in relation to the interpretation of Cohen's *d* (Cohen, 1988).

3.9.4 To answer research question 4, which is to survey the students' attitudes toward the peer feedback they experience, the questionnaire, learning log and interview were used to gather in-depth data for the purpose of providing an insight into students' preferences, attitudes, feelings and opinions toward the type of peer feedback they experience under 6 main headings as follows:

1. Attitudes towards peer feedback
2. Perceptions of the students' writing improvement
3. Perceptions of the quality of peer feedback
4. Attitudes towards mixed ability peer feedback group
5. Strengths and weaknesses of peer feedback they received and suggestions
6. Attitudes toward peer feedback, teacher feedback and their preferences

Moreover, these data had a role to play in supporting the quantitative results of research questions 1 to 3. The data were categorized and reported in terms of mean, frequency, or percentage and were presented through tables and graphs. Further details of data analysis procedure of each research instrument were briefly described below:

1. The Analysis of the Questionnaire

1.1 As the questionnaire comprises 2 main parts, the first part is close-ended, including 55 items. The mean score of the total sample responses for each item and its Coefficient of Variation (C.V.) was calculated, and then the data of the three experimental groups from the questionnaire were presented in tables and graphs.

1.2 For the open-ended part, the researcher first read students' answers carefully, and then the students' opinions were categorized under positive responses or negative responses. The frequency of the responses in each category was calculated. The similar opinions and reasons given by the students were tallied and reported in terms of the number of students who shared the same arguments. Quoted expressions from the students transcribed into English were also illustrated as examples.

2. The Analysis of the Learning Log

The data from 4 learning logs of the students in the three peer feedback groups were analyzed and presented in accordance with the 5 main questions set in the learner log while the categorization method of each learning log question might vary as follows:

2.1 Based on the learning log questions 1 and 2, first, the data were grouped under positive or negative responses which were then categorized under these headings.

2.1.1 Language skills and English knowledge (Language skills such as writing, reading, speaking and listening, and English knowledge in grammar, vocabulary, mechanics, contents, organization).

2.1.2 Non-linguistic factors (consisting of 3 subheadings: cognitive skills, affect, and others).

2.2 For the learning log question 3 asking about the difficulties the students found as a writer and a reader, there is no doubt that all the responses were negative in nature. However, the data were categorized under 3 headings; language skills and English knowledge, non-linguistic factors, and no problem found. The details of the first two headings were similar to those of the learner log questions 1 and 2.

2.3 In regard to the learning log question 4 asking *what is the most and least confident area in the students' writing*, the data was categorized in 5 main aspects which are content, organization, vocabulary, language use and mechanics.

2.4 For the last question in the learning log asking what the students will do to write better, the data was grouped under 12 main responses expressing what they intended to do. The entire determined categories derived from the emerging data.

Finally, the students' responses to each learning log question were tallied in accordance with the headings mentioned above, and then the frequency and percentage of each category was calculated and presented in terms of tables.

Importantly enough, it is noted that the results of the learning logs were presented into 2 phases. The first phase includes the first two logs distributed before the mid-term exam, so the sum of the response frequency from learning log 1 and learning log 2 were reported in the first phase, while the sum of the response frequency from learning log 3 and learning log 4 distributed after the mid-term exam were shown in the second phase.

3. The Analysis of the Interview

The interview data were derived from 27 randomly selected subjects- 3 high, 3 moderate, and 3 low proficiency students from each peer feedback group. After the interview session was conducted, the data from the audio tape recording were first transcribed and then categorized in 6 main headings mentioned earlier.

After that, the differences and similarities of the attitudes toward the regarded issue of the students in the three peer feedback groups were tallied, calculated and reported in terms of frequency. Examples of quoted expressions from the students transcribed into English were also illustrated.

In conclusion, this study was true-experimental research conducted to achieve the four research objectives which were mentioned in the first chapter. A quantitative approach played a major role to investigate the main effects and interaction effect of

types of peer feedback and levels of general English proficiency on the students' writing achievement while a qualitative approach was utilized to collect and analyze the data in order to gain more in-depth data about the students' attitudes toward the different types of peer feedback and to support and confirm the quantitative data as well.