

## Chapter 3

### Methodology

This research is a qualitative case study on project-based learning for EFL instruction and learning through the telecommunication activities on the Internet. The researcher intended to investigate the challenge of implementing this type of teaching by tracing the teaching and learning progress of English course and its related extension activities. This chapter explains the methodology of the study. It contains information about participant selection, data collection methods and procedure, and data analysis.

#### 3.1 Participants

In order to investigate how EFL teachers implemented PBL with IT in the classroom, experienced teachers with the innovative instruction were needed for the case study. In an in-service teachers' workshop, the researcher was inspired by the team teachers of the AJET digital school, which also took charge of Taiwan IEARN. Therefore, the researcher asked for help from them. The facilitator of the digital school recommended some enrolled teachers in northern Taiwan for the researchers' convenience, and the vice principal of the digital school recommended the teaching team as the participants of this study.

Three English teachers originally worked on the projects with their homeroom students as a teaching team in the same school. After the researcher completed the first interview with the three participant teachers and students, one of the teachers, Wendy (pseudonyms), had to be a substitute for a colleague of the school who was seriously injured in a car accident. Overloaded with work, she had little spare time, so she asked to be dropped from the research. The other two teachers and their

homeroom students were successfully investigated by the researcher.

The participants mainly came from two groups, (A) two English teachers of a junior high school, and (B) 42 homeroom students from each of the teacher's classes. They collaboratively achieved their goal of implementing project-based telecommunication activities with IT for EFL learning. The study focused more on instruction, but information about students and their participation is included as supporting evidence. To protect the privacy of the participants, pseudonyms were used and classes were numbered in the study. Table 3.1 presents the participant teachers' backgrounds.

Table 3.1

*Backgrounds of Participant Teachers*

<u>Participant</u>	<u>Gender</u>	<u>Years of Teaching</u>	<u>Age</u>	<u>Education</u>	<u>Homeroom class</u>
Caron	Female	15 (by 2006)	46	Master's	class 1
Nancy	Female	11 (by 2006)	35	Bachelor's	class 2

Because of the time constraint, focused group interviews were conducted with students to elicit the learners' viewpoints as one of the data collection methods (Krueger & Casey, 2000; Yin, 2002). Four representative students from each class were chosen with different language levels and motivations according to a report of an action research on their first project. The participant teachers applied for an educational action research from the MOE to investigate on the implement of the *Teddy Bear project* in 2004. The report was collaboratively edited by the participant teachers and students with exchanged message via email, students' writing products and reflection, teachers' teaching plans, and the analysis of a questionnaire conducted to the students. The researcher first read the report, observed students' writing, and

then chose five or six representative students from each class based on their language performance of the writing tasks, expression and reflection on the questionnaire. At last, the researcher discussed with the teachers to select four different styles of the students from each class as the interviewee of this research. They were (A) excellent achievers, (B) medium level students, and (C) low-level literacy in English but with high motivation in project learning, and (D) low-level literacy in English and without interest in project learning (Table 3.2). The levels were defined according to their English use the researcher reviewed in their first project report and discussed with the teachers. Details about the cases will be described in Chapter 4.

Table 3.2

*Representative Types of Participant Students*

- Class 1, Caron’s homeroom students

<u>Name</u>	<u>Features</u>
CS1, Crystal	Excellent and was able to write directly in English
CS2, Jason	Medium level and probing for questions
CS3, Stella	Low-level but with high motivation in project learning
CS4, Joe	Low-level and without interest in project learning, but good at computers

- Class 2, Nancy’s homeroom students

<u>Name</u>	<u>Features</u>
NS1, Cliff	A top student in the grade, but often wrote “no comment” in his feedback
NS2, Lucy	High achiever in class, and was enthusiastic
NS3, Elean	Medium level, but was not confident, and disliked the project learning
NS4, Kevin	Very low level, and had no comment on the project learning

The participants' school was a public high school with both middle and secondary students in a small city of the Taipei County in Taiwan. Both teachers had been teaching there for more than 10 years. As the teachers' analysis and the researcher's observation, the school district was not one of the more affluent areas of the city. Most students were from laboring families, and their parents were mostly conservative and held traditional ideas about learning—the goal of studying was to get admitted into a good senior high school. Many excellent students of well-educated or well-to-do families in the school district preferred to enter private high schools nearby or in the Taipei municipal junior high schools. The performance of the students' study of the participants' school was considered as average. About half of the students had the Internet connection at home. In order to facilitate student learning, the school offered complete computer facilities and printers in a learning corner of the school library. Students without computers or the Internet at home could make use of the corner at school. The corner closed at 5 p.m. and the library at 9 p.m.

The participant teachers worked as a teaching team to conduct action research during an email exchange project in the spring of 2004. All the students in the two classes participated in the project. Both teachers did the project in an English conversation class, which was in the regular curriculum, not as part of the outside activities. The administrators of the school supported the teachers to the best they could. They held a parent-teacher meeting to explain the project and to persuade parents to support the new way of learning. Doubts and questions inevitably arose from parents. However, they all accepted the teachers' proposal in the end.

Before the first project came to an end, some parents encouraged the team teachers to continue the learning activity. The students, therefore, had the chance to engage in the project learning almost throughout the duration of junior high school. This research was conducted in the last two years of the project since 2004, but took

the first project they had conducted into account. The researcher further traced the students' reflections after they finished the project before their graduation in 2006 in order to know the impact of the project on students' overall language ability and their achievement in school. The researcher kept track of the project's progress for each class and its duration. Table 3.3 is a chart showing the timeline of the comparison of students' grade and School Year, and the investigation the researcher personally got involved in.

Table 3.3

*The Comparison of Students' Grade and School Year*

<u>Grade</u>	<u>School Year</u>	<u>Researcher's Investigation</u>
Class 101 / 102	September, 2003--June, 2004	not involved
Class 201 / 202	September, 2004--June, 2005	involved
Class 301 / 302	September, 2005--June, 2006	involved

The researcher chose these participants in order to reduce the general bias against PBL. Most teachers, especially EFL teachers at primary and secondary school, assumed that only higher achievers or senior high school students or above could do the projects. They presumed that suburban and rural students and low achievers were unable to do projects due to a lack of learning resources, not to mention a lack of English proficiency. Even one of the participant teachers of the research had had this impression before engaging in the innovative instruction. People also believed that younger teachers with IT backgrounds were more capable of integrating instruction than the more experienced teachers without IT training. Besides, more junior high schools aimed at pushing students through entrance exams and thus invested much time and effort in textbook exercises and endless tests. They assumed that PBL was

“totally irrelevant learning” to the textbook or entrance exams. As will be clear later, experience of the participant teachers and students as well as the school all challenged these assumptions.

### 3.2 The Four IEARN Projects

IEARN, International Education and Resource Network, started in 1988 and is a nonprofit worldwide network affording teachers and young people to collaborate on project learning through the Internet and other technologies. Until 2007, there have been over 153 projects for various learning themes and purposes, including creative or language arts, science, technology, math, culture, society, and other subject domains.

There were four projects the participant teachers undertook. Both participant teachers and their students jointly worked on the *Teddy Bear project* and the *Computer Chronicles project* while Caron additionally conducted the *I Think* and 2006 Natural Disaster Youth Summit (*2006 NDYS*). Here is a brief introduction to the learning projects.

#### 3.2.1 Teddy Bear Project

This project developed by IEARN connects students from two different schools in different parts of the world. After teachers register and send a brief introduction with the needs of their classes, the facilitator of IEARN matches two partner classes from different countries. The classes send each other a Teddy Bear or other puppet through the postal system. Each student, as if they were the visiting bear, writes diary messages describing their daily lives and cultural customs and sends the messages to the other school via email. The teachers of both sides collaboratively decide on the time that will be allotted to work on the project. At the end of the project, they mail parting messages and say good-bye to their partner.

The participants of this study, Caron and Nancy, initiated the project as an action research in the spring of 2004 when their homeroom students were in the first year of junior high school. They decided to carry on the project for three months and made an adjustment in the implementation. On account of students' English language proficiency and teachers' workload, the two teachers decided to assign writing topics to the students and mailed their written responses to their collaborative classes every two weeks instead of every day.

### 3.2.2 Computer Chronicles (alternative name: A Learning Circle Theme)

This project aims to expand students' world view through collaborative writing with partners of various cultures or countries. Several classes around the world work as a project team and are taught to share their life experiences or cultures by creating an electronic newspaper ("e-paper" for short). A sample timeline for team members is given to guide them and show them how to arrange time in a Computer Chronicles Learning Circle (see Appendix D: Sample Timeline of Computer Chronicles Project). The project coordinator of IEARN regularly communicates information about procedures and deadlines by mail. He or she also requests the voluntary participants, as facilitators of the project team, to facilitate the learning exchange. During the 12 or 15 weeks of the project, the teachers guide their own students to decide on the report topics, arrange the relevant learning activities, organize the content of the reports and send the works to their partners' mailboxes. At the end of the project, they also mail final messages and say good-bye to their partners. Their works are also published on the webpage of the project under IEARN and are available for viewing worldwide.

In this study, after the participants finished their action research, they continued the interesting project. They jointly undertook the *Computer Chronicles project* during the first half of 2005 when their homeroom students were in the second school

year (class 201 and 202). They were in the same learning circle team with participants from other six countries, including the Ukraine, Australia, the United States, Bangladesh, Uzbekistan (with two participants) and Belarus. Caron was one of the volunteers to facilitate the learning exchange. They set the duration of the project at fifteen weeks, almost for the whole semester. They presented their final e-paper product on both the web pages of IEARN in America and in Taiwan.

The situation was better than that of the *Teddy Bear project* because the partners proceeded with the learning independently and in accordance with the timeline, without fear of losing contact with others. It was for this reason that both participating teachers preferred this project.

### 3.2.3 I Think Project

This project connects two classes from different countries and gives them the opportunity to exchange ideas, beliefs, cultures, habits and the like. It goes through seven stages with seven topics: introductions, country, friendships, parents, love, war, and death. In each stage, students spend two weeks to write about the topic and email or hand in their writings to their teacher. Then the teacher will collect and send the writing products to the partner. If students use some words of their native language to teach the partner class, the teacher should coordinate the language use.

Caron, one of the research participants, enrolled in the project in order to cultivate students' advanced writing skills. Because the writing topics were more abstract and less related to students' daily lives, Caron made considerable effort to guide and polish up students' writing tasks.

### 3.2.4 2006 Natural Disaster Youth Summit (2006 NDYS)

This project, known in short as “2006NDYS” later on, was conducted by IEARN



Taiwan under the AJET Digital School in Taiwan. IEARN not only successfully established a project network around the world, but has further held an annual six-day conference for its members since 1988 (known as the International IEARN World Conference). Members get together to communicate, to share news about successful projects over the past year and to propose new projects and activities for the coming year. In 1997, it started the annual Young Summit (YouthCaN, <http://www.youthcanworld.org/>) as a part of international IEARN World Conference. Students and teachers all over the world collaboratively undertake projects related to environmental issues. The NDYS has been administrated by the Japan IEARN Committee (JEARN, Japan Education And Resource Network, <http://www.jearn.jp/eng/>) since 2005. It aimed at facilitating students' project learning through practical experience of natural disasters. IEARN Taiwan held the summit in 2006 in Kaohsiung. Four hundred project participants from Taiwan, Japan, Malaysia, Iran, Korea and Trinidad participated in the summit and shared their works.

It shared some similarities with the *Teddy Bear project* in that a puppet travels as a visiting ambassador around to the participating groups or schools to report their experiences of natural disasters or environmental issues. During this thesis study, the Teddy Bear ambassador visited both classes once, but only Caron and her homeroom class participated in the project, and four students of them attended the Summit.

### 3.3 Research Design

In order to construct the characteristics of PBL for EFL instruction, the case study had to retain a holistic view of real-life events using a multiple data sources (Yin, 2002). The integral subjects with multidimensional aspects displayed the entire scope of the study because the research embraced both the piecing together of records and the development process.

After retrieving a number of different data sources, the study moved on to the stages of data analysis. With the three research questions in mind, the researcher developed a set of coding schemes using the constant comparative method. After the data were coded, the researcher looked for patterns and important emerging themes related to the three research questions (Patton, 1990; Yin, 2002).

### 3.4 Data Sources

The data were collected by the researcher personally from September, 2004 to February, 2006, containing both real-life events and materials on the web. They came from observations, interviews, questionnaires, a report of the action research on the first project, teachers' instructional materials, students' written products, and archival records on the web. Multiple research methods and triangulations were used to ensure trustworthiness of the research. Two phases of data collection were involved. First, there were interviews with the teachers and students in order to understand the belief of and the reflection on the project-based telecommunication activities. Second, the researcher tried to identify the challenges of implementation in the instruction. The researcher observed and recorded the process that teachers used to conduct the projects and collaboratively overcame challenges with their students. Finally, the data was synthesized and analyzed to evaluate the innovation for EFL instruction. Table 3.4 on the next page lists the schedule that the researcher conducted the interview and class observation.

Table 3.4

*Interview and Class Observation Schedule*

<u>Date</u>	<u>Interviewee</u> (pseudonyms)	<u>Content</u>	<u>Time Span</u>
Dec. 08, 2004	Caron	personal background	40min
	Nancy	personal background	40min
	Caron's class 201	class observation	1 period, 45min.
Jan. 11, 2005	Caron	teaching activity design	40min
	Caron's class 201	class observation	1 period, 45min.
Mar. 09, 2005	4 students of class 201	Students' attitudes and thought	30min
	4 students of class 202	Students' attitudes and thought	30min
Apr. 15, 2005	Caron	data on class webpage and online album	20min
	Nancy	teaching activity design	40min
	Nancy's class 202	class observation	1 period, 45min.
Jan. 09, 2006	Caron	project reflection	90 min.
	Nancy	project reflection	30 min.
	4 students of each class, 301 and 302	project reflection	40 min.

3.4.1 Questionnaires for Students

Two questionnaires were distributed to the students during the projects. The questionnaires were not for quantitative analysis but for research reference. The first one was designed by the participant teachers for the *Teddy Bear project (I)*, in September, 2004, to collect students' reflection and self-evaluation on the project and the feedback to the teachers, which were parts of the action research the participant teachers applied for from the MOE. Since the researcher missed the observation from

the very beginning of their projects, it also offered the researcher a precious data resource to trace their implementation process of the first project and to select representative students among the four types for the focused group interview.

The other questionnaire, based on a domestic thesis (Shyu, 2002), was designed by the researcher before the project learning wound up in 2006, before students' graduation. The researcher combined the features of PBL instruction from the thesis above and the Competence Indicators for English language learning in Grade 1-9 Curriculum Guidelines (MOE, 2006a) to gather reflection data from the students. It was to make every participant student to check their development through the projects. I also used the last focused group interview with the students to clarify the impact of PBL on their English language competence.

#### 3.4.2 Interview

Interviews with teachers and students included their background information, belief systems, their ideas about and reflections on the project learning. Before the interviews took place, questions were sent to the interviewees (see Appendix F, Questions to Interviewee (Final), for the Teachers). The interview was semi-structured, with the questions being asked in the nature of a conversation.

For the teachers, the questions for the first interview were to elicit information about personal background, teaching philosophy, experiences with previous projects and attitudes toward English instruction infused with IT. The following interviews focused on teaching plans and procedures. Due to time limitation and conversation focus, the researcher chose four representative students from each class to conduct an in-depth interview after the first interview with teachers. The purpose was to learn more about their background, students' experiences of learning English, viewpoints toward project learning, motivation and expectation.

When they were engaged in the project, the researcher interviewed the participant teachers in order to understand their teaching plans and procedures. Meanwhile, the researcher conducted a focused group interview with the representative students in order to elicit their responses regarding their collaboration and language acquisition. The interview with the teachers and the representative students at the terminal stage was held to seek illumination about the project learning and to clarify its benefit on language learning.

The interviews were audio taped. The tapes were all transcribed as interview protocols. Appendix G is one of the protocols showing details about the questions and response.

### 3.4.3 Observation

The researcher acquired the participants' permission to conduct direct observation in class to watch teachers' instruction, their interaction with students and students' behavior. The first class observation was conducted after the first interview, which gave the researcher a general idea of the teachers' instruction and their interaction with the students. Since classes had been previously interviewed by news reporters, and observed by visiting guests from Taiwan IEARN, the students were familiar with the research context. Nevertheless, the researcher sat at the back corner of the classroom to minimize any effect her presence might have.

The observation focused on the collaboration and implementation among the teacher and the students. How the teacher scaffolded the learning process and how the students achieved their presentation were the crucial concerns. The classroom observation was documented with tape recorders, a camera and field notes. The tape was transcribed according to protocols, and the pictures and notes were collected as research sources for further analysis and interpretation.

#### 3.4.4 Archival Records

For many case studies, archival records—often taking the form of computer files and records—are also relevant (Yin, 2002). PBL with multimedia diversifies archival records. Virtual environments on the web, including email account, webpage, online photo albums and forums are precious opportunities for investigating the participants' interaction and to access their products.

The researcher had the participant teachers' permission and was given the passwords to log in and access the data in the class email accounts and class online photo albums. Information in the mailbox included a mailing list, emails, teachers' instructional plans, worksheets, and students' work. The online photo album contained photos of various learning activities while the forums were filled with students' messages. All the messages and records on the web were saved as digital files for further analysis.

The participant teachers also offered copies of students' written works. All information related to the research, mainly digital files of students' writing products and teachers' teaching material, were downloaded and printed for analysis.

#### 3.4.5 Document Analysis

Documents from the cases served as rich sources for constructing the participants' thought and action to the world. Bogdan and Biklen emphasized “working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (1982, p. 145). In this research, the document came from two sources. The main part came from teachers' instructional materials, which included teaching plans, worksheets, handouts and communication and exchange messages on the web, such as email and web forums. The other set of

supporting documents was students' writing tasks, feedbacks, records on the web, and the report on the first project. Those documents all needed re-constructing and analyzing in order to find out the challenges and implementations that contributed to language learning through PBL with telecommunication activities.

### 3.5 Data Collection Procedure

The procedures the researcher undertook included coding, categorization, triangulation, description and interpretation. The investigation was conducted for almost one and a half years from October, 2004 to January, 2006. After seeing the participants' presentation in the summer of 2004, the researcher decided to conduct this study. Both teachers immediately embraced the request from the researcher and generously provided their reports and documentation. After reading their action research reports and emailing the greeting messages with interview questions, the initial interview and class observation marked the beginning of the longitudinal research on December 8, 2004. Because the researcher was also a junior high school teacher, time constraints limited the frequency of interviews and class observation. Meanwhile, the participants had only one period per week for extracurricular activities, and they usually suspended the project for other school-wide activities and mid-term exams. The researcher had to make appointments with the participants to arrange a proper time to do the interview and class observation. Data preview from the archival records and question design expedited the observation and allowed the interviews to proceed efficiently.

Data analysis was conducted on the interview transcripts (see an example, Appendix G), notes taken during class observations (field notes) and interviews, instructional materials, students' writing products, archival records and students' completed questionnaires. The researcher focused on the content of the data in order

to identify themes, to code, to classify and identify main categories (Patton, 1990). The researcher also exemplified concepts or contentions by quoting the interviewees' talk and extracting students' reflection.

### 3.5.1 Coding

The interview and observation were audio taped, and then they were transcribed collaboratively by the researcher and an experienced transcriber. In order to reduce the redundant data and categorize the documents efficiently, coding was an important process for this study (Patton, 1990). The interview protocols, questionnaire, archival records and participants' documents were coded for the research concerns, the coding criteria of which were formulated by the researcher to reveal the challenges of implementing PBL with IT for EFL learning and teaching, especially to understand the development of students' language performance. The researcher requested an experienced English teacher to check students' writing products and the content of the English textbook. The coding with the experienced teacher was to meet a consensus in order to reach the acceptable results (Miller & Crabtree, 1992).

### 3.5.2 Categorization

The coding data was categorized into three main parts to answer the research questions. They were (A) challenges to do PBL with IT for EFL learning and teaching, (B) the process of collaboration and implementation, and (C) the external situations out of the classroom to concern. Each part was referenced with numeral data taken from the supporting data.

### 3.5.3 Triangulation

Data triangulation was an appropriate strategy to establish the credibility of



qualitative analyses from multiple sources of evidence (Patton, 1987; Yin, 2002). To ensure good research quality, the interview transcripts, photos and notes taken during the interview and in class observation, questionnaires for students, teacher's instructional materials, students' products and archival records on the web all served as multiple sources of triangulation.

#### 3.5.4 Description

The data were presented as a narration that described EFL instructional innovation through the use of IT in a practical classroom situation. The transcription of the documental material was embedded in the description of the cases in a narrative way (Miles & Huberman, 1994). The description constructed and displayed the participants' experiences of implementing the projects for EFL teaching and learning.

#### 3.5.5 Interpretation

The researcher presented interpretation about the cases and eventually synthesized and analyzed the cases. The interpretation was amplified by explaining the findings, deducting the conclusions, making inferences about the direction of future study and offering the related literature.

The next chapter, Chapter 4, describes the two cases along with details about the projects that were undertaken. Findings and discussions follow in Chapter 5 and conclusions and suggestions in Chapter 6.