

CHAPTER THREE

METHODOLOGY

This chapter aims to delineate how the researcher conducted this research step by step. To begin with, the researcher offers hypotheses of this research to echo the research questions in the end of chapter two. Next, the participants' detailed information is provided. Additionally, the major two instruments adopted in the research are introduced to explain why the researcher used them. Then, the procedures of the research are followed. Finally, the statistical treatments used to analyze the data are presented.

3.1 Participants

Totally, 257 Northern Taiwanese sixth-graders participated in the study. These students were chosen from two urban and two rural elementary schools in Taipei Country to attend the standard of stratified sampling (see Table 1). Eight classes were randomly chosen to complete the research. Among the subjects, 139 were male and 118 were female. The participants were selected on the basis of the following concerns. First, these students started to learn English at school at third grade with two English classes (eighty minutes) per week and had already studied English for

Table 1. Residential Areas and the Numbers of Classes and Students of Participating Schools

	Urban School		Rural School	
Residential areas	Jhonghe City	Jhonghe City	Danshuei Township	Sansia Township
Numbers of classes	2	2	2	2
Numbers of students	62	69	63	63

almost four years. Thus, they had enough school experiences of English learning to take the English reading proficiency test. Secondly, as this research required the participants to fill out the inventory of multiple intelligences, the researcher chose the sixth graders with cognitive maturity to achieve the task in the research.

3.2 Instruments

The researcher employed the following two instruments in the research.

3.2.1 English Reading Proficiency Test

The English reading proficiency test was adopted from Saxoncourt Tests for Young Learners of English (STYLE). STYLE that has been developed by Saxoncourt Examinations since 1977 in the United Kingdom, is an international examination for children (Cave Educational Training, n.d.). The test was used for several reasons below. First, the content of the English reading proficiency test matches the standard of elementary English curriculum in Taiwan. That is, this test fits the indicators of English reading proficiency in Taiwanese Grade 1-9 Integrated Curriculum Guidelines (MOE, 2001). Second, STYLE is an international test, adopted by a great number of students in Japan, China, and Taiwan, and by schools elsewhere in Asia, Europe, and South Africa. Third, the test uses authentic English spoken in North America, England, and Australia.

In the present research, the subjects took the English reading proficiency test of level two (see Appendix 1) based on the English vocabulary list of elementary level released by Taipei County's Education Bureau, and the comparative table suggesting how to choose the test of right level offered by Cave educational training company which administered the test in Taiwan. The English reading proficiency test comprises

twenty questions in three sections. The first section, with the materials designed to let students match the given sentence to the correspondent picture, tests student's sentence reading ability. The second section, with the specific word in the crossword for students to match the given picture, tests students' vocabulary ability. The third section, with students matching the answers to the questions, tests students' dialogue reading ability.

3.2.2 Multiple Intelligences Inventory

The MI inventory (see Appendix B & C) developed by Hsieh and Yeh (2000), refers to the MI theory (Gardner, 1983, 1993) and the "The Characteristics Scale of Multiple Talents" (Chien, 1998). The inventory was purported to understand elementary students' distribution in multiple intelligences (Hsieh & Yeh, 2000). Armstrong (2000) suggested teachers adopt a checklist (like the inventory) and other sources of assessment information, such as observation, collecting documents, looking at school reports, talking with parents, asking students, and setting up special activities to acquire understanding of a student's multiple intelligences. Therefore, the scores of the MI inventory can provide a reference to understanding the distribution of elementary school students' multiple intelligences through students' self-examination.

The inventory is a self-reporting questionnaire composed of eight subscales to examine the eight multiple intelligences. Since each subscale comprised eight statements, there are sixty-four statements scored in the form of six-point Likert scale ranging from "strongly agree, agree, slightly agree, slightly disagree, disagree, to strongly disagree."

Furthermore, the MI inventory was constructed with effective reliability and validity. In terms of reliability, Cronbach α coefficient of the overall MI inventory

was .97. Besides, Cronbach α coefficient of each subscale was significant ($p < .001$): linguistic (.89), logical-mathematical (.87), spatial (.88), bodily-kinesthetic (.83), musical (.84), interpersonal (.83), intrapersonal (.80), and the naturalist intelligences (.81). On the other hand, the inventory has effective validity based on the criterion correlation coefficient between the intelligences and students' academic scores in school. The students' academic scores of Chinese, math, arts, physical education and gregariousness are significantly correlated ($r^2 = .23 \sim .56$, $p < .05$). The correlation coefficients were as follows: linguistic intelligence and Chinese academic score ($r^2 = .43$, $p < .01$), logical-mathematical intelligence and mathematical academic score ($r^2 = .56$, $p < .01$), special-visual intelligence and arts academic score ($r^2 = .23$, $p < .05$), bodily-kinesthetic intelligence and physical education academic score ($r^2 = .23$, $p < .05$), interpersonal intelligence and gregariousness score ($r^2 = .35$, $p < .01$), musical intelligence and music academic score ($r^2 = .42$, $p < .001$). Last, the inventory got the significant relationship ($r^2 = .25 \sim .60$, $p < .05$) and agreement between the scores from home-room teachers' assessment of multiple intelligences and the scores from each subscale.

3.3 Procedures

Owing to the effective reliability and validity of these two instruments which have been adopted by several domestic studies, the research was administered directly without pilot study. The procedure of the research consists of four steps: formal testing, scoring, grouping, and data analysis.

3.3.1 Formal Testing

The MI inventory and English reading proficiency test were administered in June,

2006. During the period, the school curriculum for sixth grade came to an end. Thus, much time was available for the formal testing. The implementation of MI inventory and English reading proficiency test took forty minutes respectively on separate days to avoid students' boredom and careless answers. In order to guarantee the effectiveness of data, the researcher consulted with students' home-room teachers or English teachers in advance to instruct students how to respond and answer the instruments appropriately. What's more, to reduce students' nerves, at the beginning, students were informed that their answers to the MI inventory and scores of the English reading proficiency test would not affect their academic scores and their personal data would be kept confidential.

3.3.2 Scoring

Because the MI Inventory was constructed on the six-point self-statement, each statement could range from one to six. The MI inventory consisted of eight subscales. Thus, student's score on each subscale could range from eight to forty-eight. The English Reading Proficiency Test (see Table 2) had twenty questions and each question was given five points. So, the first part had thirty-five points for seven questions; the second part had thirty points for six questions; the third part had thirty-five points for seven questions.

Table 2. Scoring of the English Reading Proficiency Test

English Reading Proficiency test	Sentence	Vocabulary	Dialogue
Numbers of questions	7	6	7
Scores	35	30	35

3.3.3 Criterion for Grouping

The criterion for high and low achievers was based on the students' scores in the

reading proficiency test. High achievers scored at the upper 33 percent while the low achievers scored at the bottom 33 percent.

3.4 Data Analysis

After finishing the MI survey and English reading proficiency test, the data were put into the computer, following the well-formulated guidelines of data entry, verification, coding, and processing to reassure validity and reliability.

The researcher adopted the following statistical treatments to analyze her data. First of all, descriptive statistics were used to report the numbers of students, the means, and the standard deviations of students' English reading scores and multiple intelligences. Secondly, multiple regression was executed to ascertain the correlation between students' multiple intelligences and English reading proficiency. Last, T-test was performed to investigate the differences in English reading proficiency and multiple intelligences between high and low achievers, and between boys and girls. The significance level was set at .05 due to the sample size.