THE RELATIONSHIP BETWEEN MULTIPLE INTELLIGENCESAND GRAMMATICAL ERRORS IN ENGLISH WRITING MADE BY EFL LEARNERS

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in English Language Studies

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ความสัมพันธ์ระหว่างพหุปัญญากับข้อผิดพลาดทางด้านไวยากรณ์ในการเขียนของนักศึกษาที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ

นายจวง เหว่ย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรดุษฎีบัณฑิต
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Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

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ชวง เหว่ย : ความสัมพันธ์ระหว่างพหุปัญญากับข้อผิดพลาดทางด้านไวยากรณ์ในการเขียนของนักศึกษาที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ (THE RELATIONSHIP BETWEEN MULTIPLE INTELLIGENCES AND GRAMMATICAL ERRORS IN ENGLISH WRITING MADE BY EFL LEARNERS) อาจารย์ที่ปรึกษา : อาจารย์ ดร. ธีรวิทย์ ภิญโญณัฐกานต์, 179 หน้า

งานวิจัยนี้ศึกษาความสัมพันธ์ระหว่างพหุปัญญาและข้อผิดพลาดด้านไวยากรณ์ โดยมีจุดประสงค์เพื่อที่จะ 1) สำรวจข้อผิดพลาดด้านไวยากรณ์และพหุปัญญาของนักศึกษาจีนที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ; 2) ศึกษาค้นคว้าความสัมพันธ์ระหว่างข้อผิดพลาดด้านไวยากรณ์และพหุปัญญา และ 3) ศึกษาเปรียบเทียบจำนวนข้อผิดพลาดของนักศึกษา 2 กลุ่ม ที่ใช้การสอนที่แตกต่างกัน ได้แก่ กลุ่มควบคุมที่ใช้การสอนแบบปกติไม่คำนึงถึงพหุปัญญา และกลุ่มทดลองที่คำนึงถึงพหุปัญญาของนักเรียนที่เป็นรายบุคคล นักศึกษาที่เข้าร่วมการศึกษาวิจัยครั้งนี้มีจำนวน 74 คน เป็นนักศึกษาชั้นปีที่ 1 เรียนภาษาอังกฤษเป็นวิชาเอก ที่วิทยาลัยยานยนต์กวางเจา ประเทศสาธารณรัฐประชาชนจีน นักศึกษาทั้งหมดลงทะเบียนเรียนในปีการศึกษา พ.ศ.2552 โดยแบ่งเป็น 2 กลุ่มชั้นเรียน สุ่มตัวอย่างจัดเป็นกลุ่มควบคุมและกลุ่มทดลอง ใช้วิธีการศึกษาในเชิงปริมาณ รวบรวมข้อมูลโดยการแจกแบบสอบถาม ภาระงานเขียน และแบบทดสอบการแก้ไขข้อผิดพลาดของนักศึกษาทุกคน จากนั้นวิเคราะห์ข้อมูลโดยการตรวจสอบการกระจายความถี่ของพหุปัญญา และข้อผิดพลาดด้านไวยากรณ์ของนักศึกษา แล้วตรวจสอบผลที่ – เทสต์ ที่ใช้ตัวอย่างอิสระ ของนักศึกษาทั้ง 2 กลุ่ม การศึกษาวิจัยครั้งนี้พบว่า นักศึกษาจีนที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศมีข้อผิดพลาดดังนี้ 1) ข้อผิดพลาดด้านไวยากรณ์ที่พบบ่อยที่สุด ได้แก่ การใช้คำกริยาที่ไม่ถูกต้อง, 2) ระดับสติปัญญาสูงสุดที่พบได้แก่ ระดับสติปัญญาที่เกี่ยวกับความสัมพันธ์ภายในตัวบุคคล, 3) สหสัมพันธ์ที่เด่นชัดที่สุด เป็นสหสัมพันธ์เชิงลบที่พบระหว่าง สติปัญญาเกี่ยวกับการมองเห็น และข้อผิดพลาดด้านคำนำหน้านาม และ 4) กลุ่มทดลองที่ได้รับการสอนแบบเน้นพหุปัญญา มีผลการเรียนในด้านการแก้ไขข้อผิดพลาด ดีกว่ากลุ่มควบคุม ซึ่งได้รับการสอนแบบปกติ

สาขาวิชาภาษาอังกฤษ ลายมือชื่อนักศึกษา_____

ปีการศึกษา 2554 ลายมือชื่ออาจารย์ที่ปรึกษา_____

ZHUANG WEI : THE RELATIONSHIP BETWEEN MULTIPLE INTELLIGENCES AND GRAMMATICAL ERRORS IN ENGLISH WRITING MADE BY EFL LEARNERS. THESIS ADVISOR : DHIRAWIT PINYONATTHAGARN, Ph.D., 179 PP.

MULTIPLE INTELLIGENCES/ GRAMMATICAL ERRORS

This study focuses on the relationship between multiple intelligences and grammatical errors. Specifically, the purposes of the study were to : 1) make surveys of the grammatical errors and multiple intelligences of some Chinese EFL learners; 2) explore the possible relationship between grammatical errors and multiple intelligences and 3) make a comparison between two groups of learners of the number of their errors after they received two different kinds of instruction – the control group were given normal instruction, ignoring the subjects' multiple intelligences, while the experimental group were given instruction catering to each subject's individual intelligences. The subjects were 74 first year English major students at Guangzhou Automobile College, China. All were enrolled in 2009, and they belonged to two classes, one of which was randomly designated as the control group and the other as the experimental group. The method used in the study was quantitative. The data was collected by administering a questionnaire, a writing task, and an error correction test to all the subjects. Then the data was analyzed by examining the frequency distributions of the students' multiple intelligences and their grammatical errors, checking bivariate correlations between their multiple intelligences and their grammatical errors, and inspecting results of independent-samples t tests on the two groups of subjects. The study found that among these

Chinese EFL learners: 1) the most frequently made grammatical errors were incorrect usage of lexical verbs, 2) the highest intelligence shown was intrapersonal intelligence, 3) the most obvious correlation was a negative one found between visual intelligence and article errors, and 4) the experimental group that received instruction based on multiple intelligences performed better in error correction than the control group which received normal instruction.

School of English Student's Signature_____

Academic Year 2011 Advisor's Signature_____

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LIST OF ABBREVIATIONS

CA	=	Contrastive Analysis
EA	=	Error Analysis
ESL	=	English as a Second Language
IQ	=	Intelligence Quotient
IL	=	Interlanguage
L2	=	Second Language
MI	=	Multiple Intelligences
NNS	=	Non-native Speaker
SLA	=	Second Language Acquisition
SPSS	=	Statistical Program for Social Sciences
T-Test	=	Test for Mean Differences between Groups
UD	=	Undifferentiated
N	=	Number of Subjects

CHAPTER 1
INTRODUCTION

This chapter offers an introductory description of the whole study. It starts with the background of the study, followed by a statement of problems, the purposes of the study, the research questions, the significance of the study, and ends with an outline of the dissertation.

1.1 Rationale of the Study

It is well known that writing is one of the four basic skills (listening, speaking, reading and writing), but it is also the last language skill to be acquired for native speakers of the language as well as for foreign/second language learners (Hamp-Lyons and Heasly, 2006: 2). Improving writing skills is of great help for information exchanges among people in a formal way. In spite of the rapid technological advances in voice transmission, writing as a traditional medium of human expression is never outdated. Though both speaking and writing are language output, they are quite different in the ways in which they treat the process of negotiation of meaning, as Penman (1998) pointed out, in spoken conversations with others, we make sense of the dialogue in a complex back-and-forth process of negotiation of meaning between speakers. In written texts, this instant back-and-forth

negotiation is not possible; there is only ‘one pass’. The sentence is written and it is read. Because there is no possibility of negotiating the meaning of written documents, inevitably, problems of misunderstandings arise.

Hence, we can say that writing is an intricate and complex task; it is the most difficult of the language abilities to acquire (Corder, 1974). This is especially true for foreign language learners. The level of difficulty with writing varies between writers who are native speakers of the language (in this case English) and writers who are non-native speakers (in this case Chinese) of the language. The non-native speakers (NNS) have to spend extra efforts to avoid grammatical errors, which is key to make their writing comprehensible and communication effective.

Here it is essential to make a distinction between errors and mistakes, though every mistake or error made by a writer can be a blind spot to its reader. An error, according to James (1980), is a kind of incorrectness that cannot be self-corrected while a mistake is a lapse that can be self-corrected. On the one hand, an error is systematic i.e. likely to occur repeatedly and not recognized by the learner, on the other hand, a mistake indicates a performance error that is either a random guess or a slip, in that it is a failure to utilize a known system correctly (Brown, 2000). Errors take place when deviation arises as a result of lack of knowledge. Mistakes occur when learners fail to perform to the level of their competence. In this study, mistakes are not taken into account partly because the students who were asked to write a short paragraph in English had enough time to do a self-check prior to handing their work

in and partly because students in writing are less likely to make mistakes than in speaking.

Many studies on error analysis and treatment have been conducted since 1960s. Considering error analysis is an effective way to reveal the underlying system operating within the second language, diminish systematic deviation from native-like language competency, and achieve the ultimate goal of communicative fluency, it still deserves further investigation in the light of various situations and perspectives such as this study which is from the perspective of the learners' multiple intelligences. As proposed by Gardner (1983, 1999) the multiple intelligences (MI) theory is an important contribution to cognitive science and constitutes a learner-centered philosophy that is "an increasingly popular approach to characterizing the ways in which learners are unique and to developing instruction to respond to this uniqueness" (Richards & Rodgers, 2001: 123) .

Given such rich connotations contained in multiple intelligences, it is natural for the researcher to pose and ponder the corollary that there might be pertinence between multiple intelligences and language errors. This association is not a miracle in that we human beings are born with curiosity and impulsion to explore the unknown world. The eminent physicist Zeilinger (2011:82) says, "We would not have our civilization if people weren't curious about things. To me this is the most important driving force in science." The present research started as a result of curiosity over why many EFL learners, in particular, Chinese EFL learners, following the normal curriculum make

little improvement in language accuracy in writing, as well as lack motivation to solve the problem.

It needs to be clarified that the focus of this study is not on writing but on errors that are elicited from the writing; in other words, writing is both a tool and a goal which contains errors. It is the analysis and treatment of errors with multiple intelligences that constitutes the core of the research. It is necessary to focus writing for the study; after all to EFL learners good writing depends largely on the extent and range of the errors they make. Therefore, to a great extent, the reduction and elimination of errors means an improvement in writing.

1.2 Statement of Problems

It is common for many EFL learners following the normal curriculum to make little improvement in language accuracy in writing even after many years of study. Errors are inevitably the biggest problem for almost all foreign language learners in their writing. Even more serious is the fact that the errors made by the learners tend to be made repeatedly until a permanently irreversible condition is reached: fossilization.

It is beyond question that a large number of sources contribute to EFL learners' errors according to past research. However, is there the possibility that EFL learners' multiple intelligences can play a role in the errors they make? What is the function of multiple intelligences theory in foreign language teaching and learning? What is the function of multiple intelligences theory in foreign language teaching and learning, in

the case where one group of EFL learners receives the same instruction but disregarding the differences in multiple intelligences of the learners, while the other receives tailored-made instruction based on his or her multiple intelligences? Intuitively, we believe that smarter people make fewer errors. From this starting point, the researcher tried to investigate the relationship that occurs when smartness is broken down into multiple intelligences, and errors are specified as grammatical errors.

1.3 Purposes of the Study

The purposes of the study were:

1. To make surveys of the grammatical errors and the multiple intelligences of Chinese EFL learners who were first year students of English major at Guangzhou Automobile College in China.

2. To explore the possible relationship between grammatical errors and multiple intelligences in Chinese EFL learners.

3. To make a comparison between two groups of learners regarding the number of errors after they receive two different kinds of instruction – the control group followed undifferentiated instruction ignoring the learners' multiple intelligences, and the experiment group obtained instruction catering to each learner's multiple intelligences.

1.4 Research Questions and Hypotheses

The study was designed to answer the following four questions:

1. What kinds of errors are frequently made by EFL learners?

2. What are the characteristics of multiple intelligences of EFL learners?

3. Are there any relationships between EFL learners' multiple intelligences and the types of errors they make?

4. Are there any differences in error-correction between the two groups of EFL learners after they have received two different kinds of instruction? One receives the same instruction which disregards the variations of multiple intelligences in each learner; the other received tailormade instruction based on his or her multiple intelligences.

Based on the above four questions, two null hypotheses were formulated as follows:

1. There is no relationship between EFL learners' multiple intelligences and types of errors.

2. Multiple intelligences based instruction does not make a difference to the students' performance in error-correction.

1.5 Significance of the Study

This study consisted of the problem discovery, problem analysis and problem solution respectively. In this case, the problems were the EFL learners' deviations

from the target language, i.e. grammatical errors, and the problem discovery or in other words the identification of errors, was realized by checking the subjects' writing. The problem analysis or error analysis was the process of summarizing the distributions of errors among the subjects who have different strengths and weaknesses in their multiple intelligences. The solution of the problem is the study of relationship between multiple intelligences and grammatical errors, and the treatment of the subjects' grammatical errors with multiple intelligences theory.

The significance of error identification lies in fact that as a starting point in this study it conforms to the recent trend of student-centered learning in the field of second language acquisition (SLA). Nowadays student-centered learning methods are popular around the world. According to the explanations given by Estes (2004), Iyoshi et al. (2005), Pedersen & Williams (2004), and Pedersen & Liu (2003), student-centered learning is an approach to education focusing on the needs of the learners, rather than those of others involved in the educational process, such as teachers and administrators. This approach has many implications for the design of curriculum, course content, and the interactivity of courses. Theorists like John Dewey, Jean Piaget, and Lev Vygotsky, whose collective work focused on how students learn, are primarily responsible for the move to student-centered learning. Student-centered learning is quite different from the traditional approach to college teaching with most class time being spent with the professor lecturing and the students watching and listening., as it is about helping students to discover their own learning difficulties, such as grammatical errors in language learning.

The significance of error analysis is reflected in the number of attempts to find out the sources of errors and take pedagogical precautions towards them. The ultimate goal of error analysis is the elimination or at least reduction of errors in the end through proper pedagogy. As an old saying goes, to know the disease is half the cure.

EFL learners' errors are closely related to their interlanguage, which is influenced by learning strategies and teaching methods. The interlanguage (IL) theory was put forward first by Selinker (1972) who refers to it as a learners' intermediate language system. Corder (1971) used the term "idiosyncratic dialect"; and Nemser (1971) called it "approximate system".

As the level of EFL learners' interlanguage is not directly observable, the analysis of errors becomes a simple and effective alternative to describe the learners' language ability. Furthermore, the exploration of possible relationships between their multiple intelligences and grammatical errors will be of great help in deciding what teaching students most need and, more importantly, how they should be taught.

The significance of the treatment of errors rests with the de-fossilization of EFL learners' interlanguage through treating grammatical errors with MI theory. According to Nakuma, (1998) fossilization is a term used to denote what appears to be a state of permanent failure on the part of an L2 learner to acquire a given feature of the target language.

In this study, the multiple intelligences theory as an independent variable is introduced into consideration versus dependent variable - grammatical errors. If, as

expected, the application of the MI theory does help de-fossilize EFL learners' interlanguage, it should be taken as a breakthrough in the development of pedagogy.

1.6 Definitions of Key Terms

As the present study is interested in the investigation of the relationship between multiple intelligences and grammatical errors in English learners, naturally the multiple intelligences and grammatical errors are the key terms to be defined in the first place.

1.6.1 Definitions of Multiple Intelligences

Intelligence, which is a very old concept initially perceived as unitary, has been employed in the most varied ways over a long history. Webster (2005) explains the word 'intelligence' comes from the Latin verb *intelligere*, which means (1) the ability to learn or understand or to deal with new or trying situations; (2) the ability to apply knowledge to manipulate one's environment or to think abstractly as measured by objective criteria as tests. In fact, just as Brown (2000:108) suggests, "Intelligence has traditionally been defined and measured in terms of linguistic and logical-mathematical abilities. Our notion of IQ (intelligences quotient) is based on several generations of testing of these two domains, stemming from the research of Alfred Binet early in the twentieth century."

It is undeniable that tests measuring general intelligence have been extremely useful for prediction and diagnosis in a wide range of situations (Resnick, 1976;

Sternberg, 1982). Nevertheless, IQ tests have been remarkably unsuccessful in accounting for individual differences in levels of performance in the arts and sciences and advanced professions (Tyler, 1965).

Nowadays, educators and researchers have shifted their attention from the traditional view of intelligence to the theory of multiple intelligences as proposed by Gardner (1983) who defines intelligence as the ability to solve problems or to create fashion products that are valued within one or more cultural settings. This definition challenged the traditional psychological view of intelligence as single or dual capacities that drive linguistic or logical-mathematical thought. Similarly, Gardner (1999) defined intelligence as the bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture. His research indicates that there are several distinct forms of intelligence that may be independent of each other. A person can be low in one domain, but high in another. All of us possess intelligences, but in varying degrees of strengths and in different skills. Gardner (1983) argues that intelligence is not some static reality fixed at birth and measured well by standardized testing. Instead, the intelligence is a dynamic, ever-growing reality that can be expanded during one's life through seven different intelligences: (1) linguistic or verbal (words); (2) logical-mathematical (numbers); (3) spatial or visual (pictures); (4) musical (musical/rhythmic); (5) bodily-kinesthetic (movement); (6) interpersonal (people); and (7) intrapersonal (self). Then Gardner (1993) added an eighth intelligence - the

naturalist intelligence to the list. Finally, Gardner (1999) enrolled the ninth intelligence - the existentialist intelligence to complete his list.

In brief, the traditional theory of intelligence states that people are born with a fixed amount of intelligence. The traditional theory has instructors teaching the same material in the same way to all students. Students then demonstrate what they know through uniform testing. The theory of multiple intelligences implies that instructors teach and assess differently based on individual intellectual strengths and weaknesses and develop strategies that allow students to demonstrate multiple ways of understanding that value their uniqueness (Starkey, 2005).

In line with Gardner (1999), the definitions of the nine separate intelligences are as follows:

1. Linguistic (Verbal) Intelligence: Sensitivity to the meaning of words, grammar rules and the function of language to persuade, remember, convey information and reflect upon language.
2. Logical-Mathematical Intelligence: Ability to see relationships between objects and solve problems,as in calculus and engineering.
3. Spatial (Visual) Intelligence: Ability to perceive and mimic objects in different forms or contexts, as in miming or impressionist painting.
4. Musical Intelligence: Ability to hear tones, rhythms and musical patterns,pitch and timbre.

5. Bodily-Kinesthetic Intelligence: Using the body,perceptual and motor systems in the brain to solve a problem, a well‐honed sense of timing, an ability to anticipate what is coming next, an overall smoothness of performance.
6. Interpersonal Intelligence: Sensitivity to the actions,moods and feelings of others, the ability to establish person‐to‐person relationships and to read the intentions and desires of others.
7. Intrapersonal Intelligence: Ability to understand and define inner feelings,as in poetry and therapy, and the ability to reflect upon one's own thoughts, feelings and sense of self.
8. Naturalist Intelligence: Strong connection to the outside world or to animals, enjoyment of outdoor activities, and ability to notice patterns and things from nature easily.
9. Existential Intelligence: Enjoy thinking and questioning, to be curious about life, and to exhibit the proclivity to pose and ponder questions about life, death and ultimate realities.

According to Mckenzie (2005) as in Figure 1.6.1, the above nine intelligences are grouped into three domains: the interactive, analytic, and introspective. The three domains are meant to align the intelligences with learners' three abilities as observed in the classroom.

The interactive domain consists of the verbal, interpersonal, and kinesthetic intelligences. The interactive intelligences are social processes in essence, as learners typically employ these intelligences to express themselves and explore their environment. The analytic domain consists of the musical, logical, and naturalist intelligences, which promote the learner's analysis of data and knowledge. The analytical intelligences are by nature heuristic processes. The introspective domain consists of the existential, intrapersonal, and visual intelligences. The introspective intelligences have a distinctly affective component in them. Thus, they are affective processes per se.

(Excerpt from Mckenzie 2005:25)

Figure 1.1 Wheel of Multiple Intelligences Domains

1.6.2 Definitions of MI Based Instruction

The MI based instruction is an especially designed instruction based on the subjects' individual intelligences. In other words, the so-called MI based instruction is

a kind of instruction which caters to each student, and which represents the student-centered teaching idea. Since there co-exist nine intelligences, in any person, according to MI theory, and the nine intelligences vary in each person, the MI based instruction is actually a personalized instruction. There should be nine kinds of instruction, each of which corresponds to one type of student who are strong in one specific intelligence. The details of how the MI based instruction is implemented and the results of the implementation will be discussed in Chapter 5.

1.6.3 Definitions of Grammatical Error

A grammatical error is obviously an error made in grammar. In order to understand what a grammatical error means, we will have to clarify the concept of grammar first.

No EFL learner can escape a formidable amount of grammar learning. For these learners, grammar is the way that words can be put together to make sentences (Barker, 2001). From an academic perspective Hornby (2005), who interprets the meaning of grammar from four aspects, provides a more comprehensive explanation as follows. A. Grammar is the rules in a language for changing the form of words and joining them into sentences. B. Grammar is a person's knowledge and use of a language. C. grammar is a book containing a description of the rules of a language. D. Grammar is a particular theory that is intended to explain the rules of a language or of languages in general. The purpose of this study is to neither study the grammar itself

nor write a grammar book or develop a particular theory of grammar: it is to explore the learners' knowledge of the rules and their use of the language.

Grammar as evidence of a person's knowledge of a language is invisible. The same is true of the knowledge of EFL learners. It is in their use of the language, either in speaking or in writing, which reveals their command of grammar. Ungrammaticality is the grammatical errors which may occur in the discourse of both native speakers and non-native speakers or EFL learners, although the characteristics of grammatical error made by native speakers and foreign language learners are quite different.

To be specific, for any normal adult native speaker, his/her grammatical errors are a failure to utilize a known linguistic system by accidentor by mistake; and even the grammatical errors made by a school child who is a native speaker are only transient and developmental in nature since the existence of countless social interactions and peer pressure which will ensure that the speaker fully conforms to the system in time.

In fact, a child becomes a specialist in its own native language from a very early age. A study conducted by Childers and Tomasello (2002) shows two-year-olds are beginning to apply the grammatical structures of the languages that they hear. The latest research (Bernal et al., 2009) finds children begin to use two or more words at a time by the age of 2 years, but their statements are typically incomplete and show no signs of grammatical knowledge. Yet upon hearing a sentence in which a noun incorrectly replaces a verb, or a verb incorrectly replaces a noun, toddlers display

split-second brain responses that signal awareness of the rule violations. Two-year-olds know more about grammar than they can say. Budding toddlers recognize the difference between nouns and verbs in simple sentences, even though they do not utter such sentences in their earliest years.

Most foreign language learners are adults who have lost their universal adaptability to pronunciation and grammaticism of a particular human language that they possessed in their earliest years. Those adult learners detached from the natural language acquisition environment of the foreign language find it difficult, if not impossible, to match their native speaker counterparts in either fluency or accuracy. One of the most obvious pieces of evidence for such deficiency in foreign language learners is grammatical errors. In fact, Corder (1967) noted that errors could be significant in three ways: (1) they provide the teacher with information about how much the learner has learnt, and (2) they provide the researcher with evidence of how the language was learnt, and (3) they serve as devices by which the learner discovers the rules of the target language. It is not by chance, therefore, that Ellis (1994) states one of the first ways in which researchers tried to investigate L2 acquisition was through the analysis of learner errors.

1.7 Outline of the Dissertation

This dissertation is organized into six chapters. They are as follows: Chapter 1 introduces the rationale of the study, the existing problems, the purposes of the study,

the research questions and the hypotheses, the significance of the study, the definitions of its key terms, an outline of the dissertation and a summary.

Chapter 2 reviews the literature on the analysis of grammatical errors and the treatment of errors in EFL learners' writing, which is divided into two parts, namely, error analysis and error treatment. In each part, the detailed history, the schools and viewpoints of error analysis and error treatment are discussed.

Chapter 3 illustrates the theoretical framework and the research design and methodology, which consists of mainly the research conceptions within a theoretical framework, general patterns of the research design, the sampling of the subjects, and measurements including instruments and the conceptions of data collection and data analysis.

Chapter 4 reports the processes of the pilot study, in which the selection of the subjects, the design of the writing task, the procedures for the error analysis, and the validity and reliability of the questionnaire are tested.

Chapter 5 discusses the actual processes of data collection in response to four research questions and two hypotheses as well as the findings elicited from the data analyses. Most of the findings are based on the results of the data analyses with the use of statistical techniques such as descriptive statistics, the one-sample t test, the bivariate correlation test, and the independent-samples t test.

Chapter 6 concludes the study with a summary of the findings, discusses the implications of the findings for language research as well as language teaching and

learning, explores limitations in the research design and methodology and makes suggestions for future studies.

1.8 Summary

Chapter one consists of eight sections: 1) the rationale of the study which describes the background and the reasons of the study; 2) the statement of the problems which establishes the issues related to both learning and teaching; 3) the purposes of the study which identify what needs to be done in the study; 4) the research questions which are formulated in order to achieve the purposes of the study, 5) the significance of the study which is in terms of the discovery of the problem, the analysis and solution of the problems, within which the principles of student-centered learning and interlanguage are explained 6) the definitions of the key terms including explanations of multiple intelligences, MI based instruction and grammatical error; 7) an outline of the proposal which gives a bird's eye view of the whole paper; and 8) a summary of the chapter.

The next chapter will focus on the related literature review for the present study.

CHAPTER 2
LITERATURE REVIEW

This chapter consists of two parts: error analysis and error treatment. The first part, error analysis, discusses the definitions of error and error analysis as well as error analysis development and error analysis procedures. The second part, error treatment, begins with the definition of error treatment, and then is followed by two opposite views on the treatment of grammatical errors, and ends with an approach to the treatment of grammatical errors.

2.1 Error Analysis

In a broad sense, error analysis (EA) provides a methodology for investigating a learner's language. For this reason, EA constitutes an appropriate starting point for the study of learner language and L2 acquisition (Ellis, 1994); but, in a narrow sense, it is a process involving several related concepts that will be discussed in detail below.

2.1.1 Definitions of Error and Error Analysis

Error analysis is a process which is used to analyze errors; therefore, the basic concepts of error and error analysis should be identified first. Although grammatical error as a key term is explained in chapter one, the definition of error again is not redundant, because here error is interpreted in the context of error analysis and error treatment.

2.1.1.1 Definition of an Error

An error, as stated by Barker (2001), is something you have done which is considered to be incorrect or wrong, or which should not have been done. A more academic explanation for error is that word error has different meanings and usages relative to how it is conceptually applied. The concrete meaning of the Latin word error is "wandering" or "straying". In this context, errors refer specifically to grammatical errors as mentioned in the first chapter.

2.1.1.2 Definition of Error Analysis

Error analysis involves a set of procedures for identifying, describing, and explaining errors in learners' language (Corder, 1974). Brown (2000: 218) notes, "The fact that learners do make errors, and that these errors can be observed, analyzed, and classified to reveal something of the system operating within the learner, led to a surge of study of learners' errors, called error analysis."

Error analysis was an enterprise born of the attempt to validate the predictions of contrastive analysis by systematically gathering and analyzing the speech and writing of second-language learners (Tarone, 1994). Although error analysis for pedagogical purposes has a long history, its use as a tool for investigating how learners learn a language is more recent andbegan in the 1960s (Ellis, 1994).

2.1.2 Development of Error Analysis

Error analysis has a long evolution. Before it took form as what is known today as error analysis, it had undergone development in structuralism, behaviorism and contrastive analysis with at least three predecessors before it.

2.1.2.1 From Structuralism and Behaviorism to Contrastive Analysis

Some psychological schools, such as structuralism and behaviorism, contributed to the birth of contrastive analysis, which finally resulted in the prevalence of the study of error analysis.

As early as 1870s, the German psychologist, Wundt, who is known as the forefather of structuralism, concentrated on the discovery of the fundamental mental components of perception, consciousness, thinking, emotions and other kinds of mental states and activities. Later on, linguistic structuralism studies, which were initiated by Saussure (1857-1913), attempted to analyze a specific field as a complex system of interrelated parts (Sturrock, 1981). In the 1940s and 1950s, the structural linguists such as Bloomfield, Sapir, Hockett, etc. were boasting of their rigorous application of scientific principles to the observation of human language, which was later criticized as anti-humanistic and out of fashion (Brown, 2000). For example, Fries (1952) created a slot-filler grammar with which a linguist would be able to describe any language in question.

According to Graham (2007), psychological behaviorism's historical roots consist, in part, in the classical associationism of the British empiricists, foremost Locke (1632-1704) and Hume (1711-76). According to classical associationism, intelligent behavior is the product of associative learning. As a result of associations or pairings between perceptual experiences or stimulations on the one hand, and ideas or thoughts on the other, persons and animals acquire knowledge of their environment

and how to act. Associations enable creatures to discover the causal structure of the world. Association is most helpfully viewed as the acquisition of knowledge about relations between events. Intelligence in behavior is a mark of such knowledge.

In modern times, based upon the research and writings of Watson, Skinner and Pavlov, behaviorism focused on the attainment of objectives in the learning process. Although there are diverse branches in the tree of behaviorism, it is agreed in the field of EFL and ESL that we learn language through a process of stimulus (listening and reading) and response (speaking and writing). Just as native speaking children imitate sounds, practice what they hear and get positive reinforcement of the correct language structures, EFL learning is a process of habit formation in essence.

Thanks to structuralism which allowed for more structural analyses of language that dealt with how words are formed and how those words are used together to form larger structures, and behaviorism which suggested that learning was largely a question of acquiring a set of new language habits, the study of two languages in contrast became dominant in applied linguistics in the 1950s. Lado (1957:1) in his book claims, "…in the comparison between native and foreign language lies the key to ease and or difficulty in foreign language learning…" In the view of Lado (1957), errors were mainly, if not entirely, the result of negative transfer or interference of L1 habits. If we say structuralism and behaviorism laid down the theoretical basis for the contrastive analysis hypothesis, then Lado's work directly described details of contrastive analysis hypothesis.

2.1.2.2 From Contrastive Analysis to Error Analysis

A contrastive analysis hypothesis claims that the principal barrier to second language acquisition is the interference of the first language system with the second language system and that a scientific, structural comparison of the two languages in question would enable people to predict and describe what the problems are and what they are not (Ellis, 1994). The strong form of the hypothesis claims that the differences between the learner's L1 and the L2 can be used to predict all errors that will occur. The weak form of the hypothesis claims that these differences can be used only to identify some out of the total errors that actually occur. In order to justify the contrastive analysis hypothesis, error analysis came into being. However, subsequent research by (Dulay and Burt, 1974) through error analysis shows that many errors predicted by contrastive analysis did not occur, which called the strong form of the hypothesis into question. Although according to Wardhaugh (1970) the weak form of the hypothesis does exist, it makes no sense to make a lengthy comparison of two languages simply to confirm that errors suspected of being caused by transfer are indeed so (James, 1980) .

Challenged by empirical research and Chomsky's attack on behaviorism (Ellis, 1994), contrastive analysis gave way to error analysis, which became distinguished from the former by its examination of errors attributable to all possible sources not just those resulting from negative transfer from the native language (Brown, 2000). While the contrastive analysis hypothesis fell out of favor following

its heyday in 1960s on account of too much simplicity and too much restriction in ESL research, error analysis detached from contrastive analysis (CA) continued to be practiced and played an important role, in that it not only concerns what is going on in the minds of language learners, but also implies how to organize an effective pedagogy for the foreign language teacher.

2.1.3 Procedures of Error Analysis

It was not until 1970 that error analysis (EA) became a recognized part of applied linguistics, a development that owed much to the work of Corder (Ellis, 1994). Many scholars tend to relegate all procedures including data collection and error identification before error treatment was introduced under the category of error analysis. For example, Corder (1974) identified a model for error analysis, which included five stages:

1. Collection of samples from EFL learners
2. Identification of errors
3. Description of errors
4. Explanation of errors
5. Evaluation of errors

Moreover, Gass & Selinker (2001) identified 6 steps followed in conducting an error analysis which includes error treatment: collecting data, identifying errors, classifying errors, quantifying errors, analyzing source of error, and remediating of errors.

However, Coder's model is more preferred among EFL and ESL academics, and Ellis (1994) and Brown (2000) elaborated on this model, gave practical advice, and provided clear examples of how to identify and analyze learners' errors.

According to Corder (1973), in the stage of collection of a sample of a learner's language, there are two kinds of error elicitation: clinical and experimental (Fig. 2.1.3.1). Clinical elicitation involves getting the information to obtain data of any sort, for example, by means of a general interview or by asking learners to write a composition. Experimental methods involve the use of special instruments designed to elicit data containing the linguistics features which the researcher wishes to investigate. In this study, the researcher employs clinical elicitation as needed.

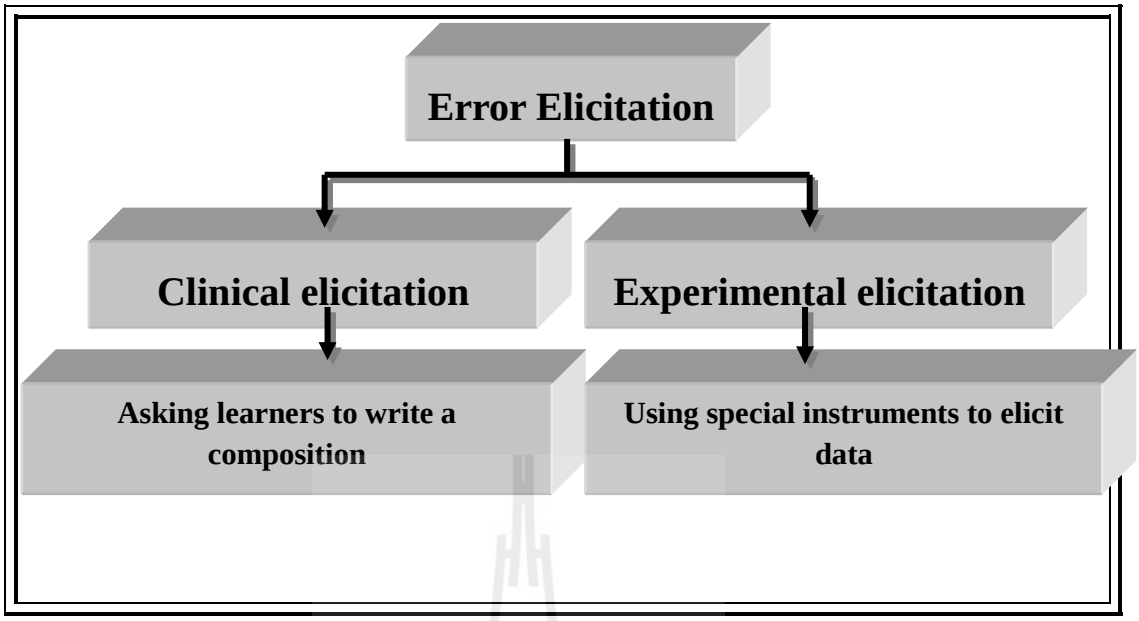


Figure 2.1 Error Elicitation

In the second stage, identification of errors, Corder (1967) identifies the distinction between errors and mistakes, and argues that EA should be restricted to the study of errors.

In the third stage, description of errors, there are three ways of describing errors as shown in figure 2.1.3.2. The linguistic method as used by Chamot (1978) was considered to be too difficult to provide a satisfactory description of learners' L2 development by quantifying the types of errors they make (Ellis, 1994). An alternative to a linguistic description of errors is to use a surface strategy taxonomy put forward by Dulay, Burt and Karshen (1982) by means of such operations as omissions, additions, misinformation and misorderings. The third type of description as described

by Corder (1974), who distinguishes three types of errors according to their systematicity, is more concerned with how learners learn an L2 .

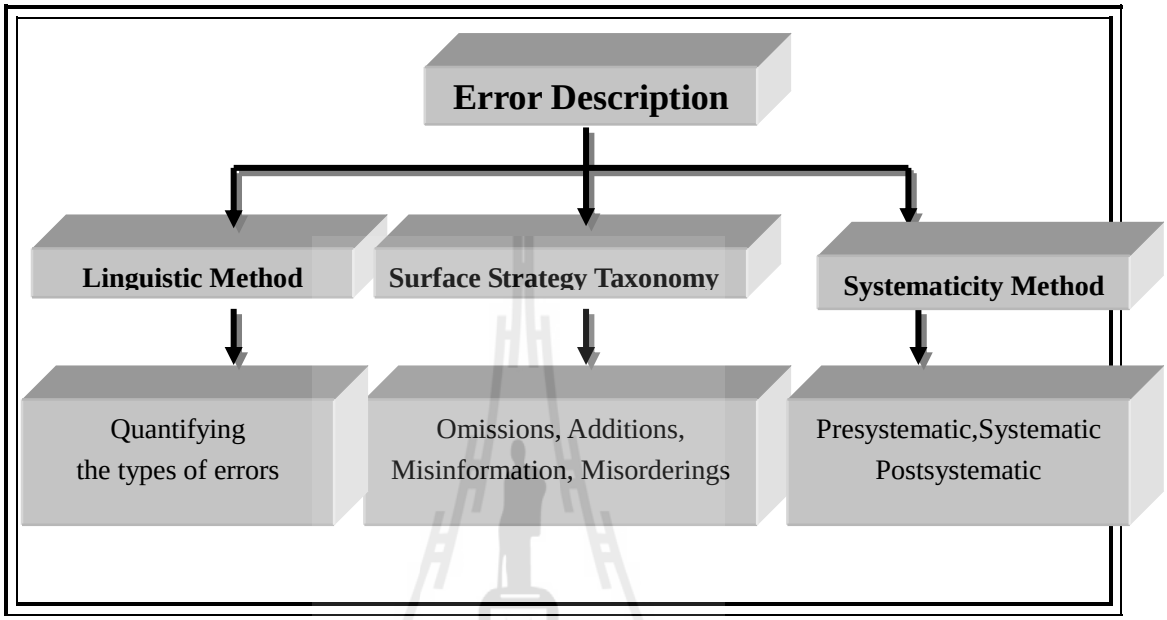


Figure 2.2 Error Description

In the fourth stage, Ellis (1994) notes, explanation of errors is most important for SLA research as it involves establishing the source of an error and the processes responsible for L2 acquisition.

Richards (1971) cites four major types or causes of intralingual (developmental) errors: (1) overgeneralization, (2) ignorance of rule restrictions, (3) incomplete application of rules, and (4) false concepts hypothesized. Later in his 1974 paper, he identifies six sources of errors, namely, (1) interference, (2) overgeneralization, (3) performance errors, (4) markers of transitional competence, (5) strategies of communication and assimilation and (6) teacher-induced errors.

According to Brown (2000), there are four sources of errors:

1. Interlingual transfer

Before the system of the second language is familiar to L2 learners, the native language is the only previous linguistic system upon which the learner draws. Thus interference is inevitable. The interference could have varying manifestations depending on the learners' particular native language.

2. Intralingual transfer

Once L2 learners have begun to acquire parts of the new system, more and more generalization within the target language occurs.

3. Context of learning

An improper educational setting e.g. a misleading explanation from the teacher or the faulty presentation from a textbook, or special social situation such as an idiosyncratic dialect language environment, would induce the learner to make errors.

4. Communication strategies

In order to enhance communication, learners may try diverse techniques to get their messages across, such as word coinage, circumlocution, false cognates, and prefabricated patterns, which can all be sources of error.

While the above stages examine errors from the point of views of learners, the fifth stage, evaluation of errors, involves the consideration of the effects of errors on the evaluator. Although a complete error analysis goes through five stages, in fact this study used only stage three, through which the grammatical errors in the writings of

the EFL learners were described in both linguistic terms and their surface strategy taxonomy.

2.2 Error Treatment

One of the major issues in carrying out foreign language instruction is the manner in which teachers deal with student errors. In the case of this study, error analysis itself is not complete until error treatment is implemented and makes a difference to the performance of the students. Error treatment as a concept and a process is discussed as follows.

2.2.1 Definition of Error Treatment

There is substantial literature dealing with the issue of error treatment and a number of terms are used to refer to the area of error treatment. For instance, Cohen and Cavalcanti (1990) denote error treatment with the term ‘feedback’, whereas Hendrickson (1984) and Hammerly (1991) describe error treatment as ‘error correction’.

Feedback has a broader meaning than error correction in terms of error treatment, for example, Chaudron (1988) suggests that the term feedback represents various types of classroom interactions. In the same way, Wajnryb (1992) recognizes feedback more specifically as teachers’ responses to what learners produce in the classroom. Generally Dulay et al. (1982) term feedback as the listener’s or reader’s responses to the learner’s spoken or written productions, but specifically Keh (1990) defines

feedback “as input from a reader to a writer with the effect of providing information to writer for purposes of revision”. Moreover, while Lalande (1982) terms feedback as any kind of procedure used to inform a learner whether his or her response is correct or wrong, Nunan (1991) differentiates the responses into negative and positive feedback. Negative feedback is defined by Ayoun (2001: 226) as “information following an error produced by the language learner”, which applies where error treatment is addressed.

Another closer and more conventional expression for error treatment is error correction. Chaudron (1986:66) defines the concept of correction as “any reaction by the teacher which transforms, disapprovingly refers to, or demands improvement of, a students’ behavior or utterance”. Ellis (1994) asserts that correction is the teachers’ attempts to provide negative evidence to deal specifically with learners’ linguistic errors. Researchers like Hendrickson (1984), Hammerly (1991) and Plumb et al. (1994) in their studies use the term correction to refer to teacher treatment of errors. They seem to treat the two terms equally.

Some researchers, however, make a clear distinction between the terms treatment and correction on the basis that correction implies a permanent cure, which is different from impermanent treatment. For example, Allwright and Bailey (1991), consciously avoided the use of the term correction in their study, claiming that even if a teacher corrects an error and manages to get a right answer, it does not mean that the error has been permanently cured. Their research focuses on investigation of the

immediate effects of teachers' responses on learner performance, i.e. a temporary treatment, which does not take into account long-term correction. Therefore, the two terms are not interchangeable in a research context.

Still other researchers like Ziv (1984) instead of employing the term treatment, develop their own taxonomy of teacher comments: explicit cues, implicit cues and teacher corrections, through which student errors are hinted at, suggested and indicated for self-correction before actually being corrected by the teacher. Obviously, the concept of correction in Ziv's study is more restricted, and it is limited only to the last step of her taxonomy - the provision of correct answers to the students by the teacher.

Overall, although there are a number of terms and explanations for the concept of error treatment, both error correction and feedback will be used interchangeably for error treatment in this study.

2.2.2 Contradictory Views on the Treatment of Grammatical Errors

There has always been a lively debate about how grammatical errors in student writing should be treated. The controversy focuses on the effectiveness of the treatment. To be objective, both the negative view and the positive view on the treatment of grammatical error in EFL writing will be discussed in the first place. Moreover, after an exploration of the relationship and a comparison between the two opposite views, the options will be clearer.

2.2.2.1 Negative View on Treatment of Grammatical Error

Some researchers are quite dubious about the instant effect of error treatment, for example, Kepner (1991) states many L2 teachers are afraid of the fossilization of learners' errors and feel obligated to correct all errors. Other researchers such as Truscott (1996) stand firm against grammar correction claiming error correction does not help students improve their written accuracy, and it is even potentially harmful to students' writing ability.

The effectiveness of error treatment can be challenged both in theory and in practice. Theoretically speaking, on the one hand, the processes underlying interlanguage development are so complex that no simple way of correction would improve performance, which is supported by Truscott (1996) whose study finds that the acquisition of a grammatical structure is a gradual process, not a sudden discovery, as the intuitive view of correction would imply. It is suggested by Edge (1989) that if students could learn so efficiently from constantly being provided with error correction, language teaching would be much easier than it is.

On the other hand, foreign language acquisition occurs in a natural order that is poorly observed in error treatment, which can be demonstrated by Pienemann's teachability hypothesis (1985) which is that there should be a relationship between the teaching sequence and the natural acquisition sequence. According to Pienemann (1985:37), "The teachability hypothesis predicts that instruction can only promote

language acquisition if the interlanguage is close to the point when the structure to be taught is acquired in the natural setting."

Likewise, Clampitt (2001) states that no matter how many times a certain grammatical structure is corrected, until the learners are ready to learn and internalize the structure, they will not be able to use it properly on a regular basis. Nevertheless, according to Truscott (1996) such developmental sequences have been poorly understood; hence, correcting errors based on natural acquisition order is impossible to practice. As a result, when teaching practices fail to affect the actual developing system, the learners are unable to or even unwilling to adopt the knowledge which is explicitly revealed by grammatical error correction while they are writing, because the learners tend to rely on their intuitions and choose only the structures that sound right to them (Truscott, 1996).

In practice, the reluctance to believe in the effectiveness of error treatment is based on the fact that grammatical error correction may discourage and demotivate learners. This worry is expressed by Krashen (1982) with the statement that correction is both useless for acquisition and dangerous in that it may lead to a negative affective response. Furthermore, according to Krashen's monitor theory (Krashen & Terrell, 1983), an over-emphasis on conscious grammar has the undesirable result of encouraging over-use of the self monitor. Stern (1992) adds if a learner's monitor is being over-used, they become hesitant and their learning will be excessively slow. Similarly Truscott (1996) notes grammar correction may lead learners to keep

negative attitudes toward writing and make them simplify and shorten their writing in order to avoid being corrected, whereas learners who do not receive grammar correction feedback have a more positive attitude towards writing and write more and in more complex sentences. They not only produce more complex sentences , but the learners who did not receive correction improved their grammatical accuracy more than those who did, as is shown in a study by Sheppard (1992). To put it simply "corrections do not increase writing accuracy, writing fluency, or general language proficiency, and they may have a negative effect on student attitudes" (Semke, 1984:195).

Although from the perspective of some researchers both theoretically and practically, the devaluation or even denunciation of the effectiveness of the treatment of grammatical errors in EFL learner writing sounds reasonable, every coin has two sides; thus the positive view on the treatment of grammatical error will be discussed below.

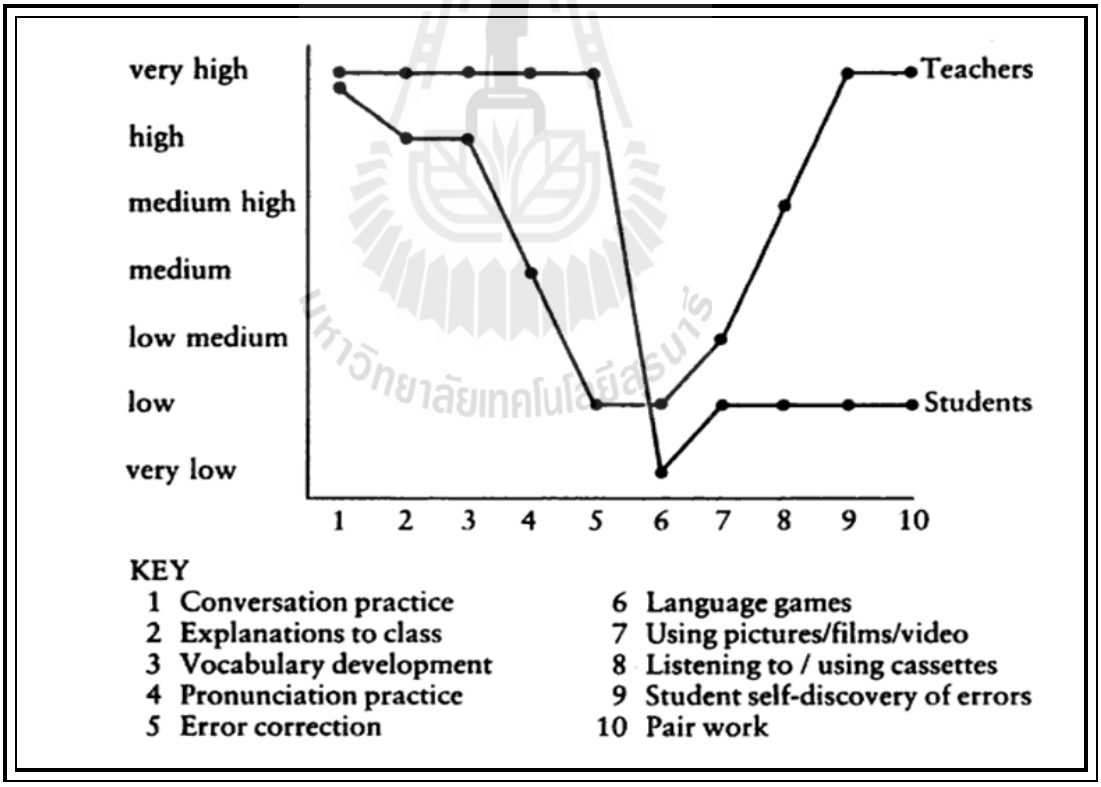
2.2.2.2 Positive View on Treatment of Grammatical Errors

By contrast to the above negative view, quite a few studies confirm the effectiveness of the treatment of grammatical error in EFL learner writing either from different perspectives or by filtering out the situations that generate negative effects.

First of all, the importance of error correction is acknowledged among both teachers and learners. Widdowson (1990:48) notes, "The very concept of pedagogy, whether defined as art or science, presupposes invention and intervention which will

direct learners in ways they would not, left to their own devices, have the opportunity or inclination to pursue." According to Widdowson (1990), error correction, as a form of intervention, is clearly an intrinsic element in teaching.

In addition, Nunan (1991) who examines the relationship between the attitudes of students and teachers finds most students take error correction as good language teaching whereas the teachers hold quite the opposite view as shown in the learning activity ratings of figure 2.2.2.2.1. Peacock (1998) corroborates such a finding in his study in which pupils valued error correction higher than their teacher did.



(Excerpt from Nunan 1991:93)

Figure 2.3 Learning Activity Ratings of Teachers and Students

In fact, many researchers demonstrate the effectiveness of error treatment through their studies. For example, Hillocks (1982) who examined the effects of teachers' comments with regard to four instructional conditions: 1) observation and writing activities with revision; 2) observation and writing activities with no revision; 3) assignment and revision; and 4) assignment without revision. The findings of this study showed that focused comments associated with assignment and revision yielded significant quality benefits. Moreover, the extent of improvement for students doing revision was nearly twice that for students receiving comments but making no revision. This finding is similar to Beach (1979), who discovered that students' revisions respond to teachers' comments and coupled with significantly higher quality rankings.

Another study by Fathman and Whalley (1990) found several positive effects of teacher feedback on compositions written by ESL college writers. The changes in compositions under four different teacher response treatments were examined. The first group of students received no feedback on their written work; the second group received grammar feedback only; the third group received content feedback instead; the fourth group received grammar and content feedback together. The results of this study show that those who receive grammar feedback do not make so many grammatical errors in recomposition. Those who receive remarks and advice improve a lot regarding the content of their work. Hence, Fathman and Whalley conclude that teachers' feedback has positive effects on students' writing. Furthermore, Nunan and

Lamb (1996) assert that making errors and subsequent teacher corrections "can provide the learners with valuable information in the target language".

But then again, even if a disbelief in the effectiveness of error treatment is rooted in the intricacy of interlanguage it does not hold water completely in that the complexity of interlanguage does not necessarily mean interlanguage is unable to be treated with proper pedagogy. Moreover, once a proper way of error correction which is beneficial to the development of learner interlanguage is ascertained and employed, the original negative view on error treatment would naturally transfer into a more positive one.

Taking into account a review of both the positive and negative positions on the effectiveness of error treatment as highlighted above we find that, by and large, error treatment should not be repealed unless its ineffectiveness and harmfulness have been conclusively proven as is implied by Ferris (1999).

2.2.3 Approaches to the Treatment of Grammatical Error

The above analysis of the value and necessity of error treatment in EFL writing prompts a discussion of the general principles as well as the specific strategy to deal with grammatical errors in real instruction as follows. The general approaches to error treatment, or in terms of Ayoun, (2001), teachers' treatment of errors, are distinguished as either explicit or implicit separately, or explicit plus implicit together as borne out in the error treatment based on MI theory.

2.2.3.1 Explicit Correction versus Implicit Correction

In order to understand better the concepts of explicit correction and implicit correction and identify which is more helpful to EFL learners through a comparison of the two didactics, firstly the explicit knowledge and implicit knowledge should be introduced, and then followed by the explicit and implicit learning and correction as well as the acquisition-learning hypothesis.

According to Ellis (1994), explicit knowledge is the knowledge of rules and items that exist in an analyzed form so that learners are able to report what they know; whereas implicit knowledge of a language is knowledge that is intuitive and tacit, which can not be directly reported. Then, corresponding to explicit knowledge and implicit knowledge there are methods of both explicit learning and implicit learning. Implicit learning is described as a subconscious and passive process, where learners are exposed to instructions inattentively and acquire knowledge from the instructions simply through exposure. Explicit learning, on the other hand, is characterized as a conscious and active process by which learners seek out the structure of any instruction that is presented to them with a degree of attention. What makes a difference between these two types of learning is the extent of consciousness with which the learner is exposed to instructions. Some psychologists suggest that much of the knowledge acquired in our daily life is learned implicitly, such as driving, swimming and language learning. While there are activities that people can do, they

cannot explain how they do them (Reber, 1976). In the table below, the differences between implicit and explicit learning, knowledge and correction are listed.

Table 2.1 Implicit versus Explicit

	Knowledge	**Learning**	**Correction**
Explicit	Exists in an analyzed form; Able to report.	Conscious, Active, Attentive, and Form focused.	Detailed direct correction.
Implicit	Intuitive and tacit; Unable to report.	Subconscious. Passive, Inattentive and Meaning focused.	Indirect correction, such as peer-correction or self-correction.

In modern linguistics, there are many theories as to how humans are able to develop language ability, the most fundamental of which is the acquisition-learning hypothesis proposed by Krashen (2003). This hypothesis suggests there are two independent ways in which human linguistic skills are developed: acquisition and learning. According to Krashen (2003), acquisition of language is a subconscious process of which the individual is not aware. One is unaware of the process as it is happening and when the new knowledge is acquired, the acquirer generally does not realize that he or she possesses any new knowledge. Both adults and children can subconsciously acquire language, and either written or oral language can be acquired. This process is similar to the process that children undergo when learning their native language. Acquisition requires meaningful interaction in the target language, during which the acquirer focuses on meaning rather than form. Learning a language,

explained by Schutz (2007), on the other hand, is a conscious process, much like what one experiences in school. New knowledge or language forms are represented consciously in the learner's mind, frequently in the form of language rules and grammar and the process often involves error correction.

Related to the acquisition-learning hypothesis, explicit correction, also defined as detailed direct correction means teachers provide learners with the correct forms or structures of their erroneous utterances. Implicit correction, in other words, is indirect correction which means that teachers indicate the presence of errors or provide some sorts of clues with the intention of peer-correction or self-correction (Ferris, 1995; Ferris & Hedgcock, 1998; Hendrickson, 1980; 1984; Lalande, 1982; Walz, 1982). To be specific, direct error feedback is provided when the correct form is written on a student's paper, whereas indirect error feedback is provided if the teacher indicates the location of the error indirectly on the paper by either underlining, highlighting, circling or indirectly by indicating in the margins that there is an error on that line but without providing the correct form (Lee, 2004).

The acquisition-learning hypothesis implies language-learning involving formal instruction is less effective than acquisition, and implicit language-learning based on meaningful interaction is more effective than explicit learning built on form. Logically, method of error treatment that contributes to acquisition is superior to a method of error treatment that is helpful to learning.

It should be noted that error treatment whether in the form of explicit correction or in the form of implicit correction is in fact a kind of instruction which is current ly used by most language teachers in response to errors committed by learner s during the course of their attempt(s) to communicate. Both explicit correction and implicit correction have their particular sphere of influence in pedagogy. For example, Kubota (2001) suggests that when there is a situation where the appropriate words or structures are extremely difficult for foreign language learners or when the luxury of intensive exposure to the target language is not available to the learners, explicit correction may help the learners to modify their incorrect utterances. Another situation where explicit correction can be utilized is when the learners believe teachers are the only or the main source of knowledge in the classroom. This is especially true among students from Asian countries.

In the light of Hammerly's study (1991), teachers' implicit clues are considered more helpful than explicit correction for the learners. Similarly, Lyster (1998) argues that corrective feedback that requires self-correction provides the learners with opportunities to acquire the process of target language learning. In addition Brookes and Grundy (1990:54) state, "In writing…self-correction is preferable to peer correction, and peer correction to teacher correction. And because rewriting or self-correction is so important a writing skill, a good teacher will provide the maximum classroom opportunity for it, and indeed will include rewriting ability in any overall evaluation of learners' writing skills." Obviously, implicit correction

makes learners more responsible for their learning (Allwright, 1981). Besides that there is research evidence suggesting that indirect error feedback is more helpful on students' long-term writing development than direct error feedback (Ferris, 2003; Fratzen, 1995). However, although explicit error correction is less advantageous than implicit error correction, it is would be impossible for teachers at school to abolish it, as student expectations and teacher responsibilities will compel language teaching programs to find the optimal strategies dealing with how to give error correction rather than consider whether to give feedback or not.

Therefore, the application of explicit and implicit error correction together is *considered more beneficial to the foreign language learner. As advised by* Hendrickson (1984), both explicit correction and implicit correction are useful in one way or the other depending on the specific setting of the language teaching, and thus they can be used in a hybrid fashion. Error treatment with the use of MI theory is just such a method which will be discussed next.

2.2.3.2 Error Treatment with Multiple Intelligences Theory

Many teachers struggle with finding ways to meet individual learning styles and needs, thus upgrading the quality of error treatment. Error treatment with use of multiple intelligences theory combines a way of explicit error correction with that of implicit error correction offers an alternative means to successful/effective error correction.

Since Gardner's multiple intelligences theory came to be known in 1983, educators and researchers have been enthusiastically discussing ways of using multiple intelligences in the classroom (Osburg, 1995). By adoption of the use of the multiple intelligences theory in the classroom, and having a multiple intelligence perspective on content instruction, teachers may see a profound difference in their teaching styles, in the curriculum as a whole, and in the organization of their classroom (Shearer, 2004). Once teachers can really take into consideration the different forms of the human intellect, they will find more effective ways of educating the students in the classroom (Gardner, 1983). In short, using multiple intelligences theory for instruction in the classroom is an effective tool that can help achieve educational goals as well (Hopper & Hurray, 2000). Starkey (2005) breaks down the benefits of instruction based on multiple intelligences to students as follows:

• Students become enthusiastic about learning. Those students who perform poorly on traditional tests are turned on to learning when classroom experiences incorporate artistic, musical, or athletic activities.

• Students are more active participants when we provide opportunities for authentic learning based on each student's needs, interests, and talents.

• Students develop increased self-esteem when they are able to demonstrate and share strengths and gain positive educational experiences.

• Students manage their own learning and begin to value their strengths.

• Student understanding increases.

The reason for the effectiveness of learning based on multiple intelligences lies in the fact that it allows students to use their knowledge about how they learn best, it can increase their enthusiasm, raise their achievement levels, and foster growth of their other intelligences (Sweet 1998). Predictably, therefore, Hopper and Hurray (2000) find multiple intelligence strategies are an excellent way for motivating students and for allowing changes to be made in the way children learn. Therefore, the multiple intelligences theory can ensure that the unique profiles of each student will be recognized, supported, and developed (Shearer, 2004). Likewise, when a teacher's focus is centered on what the students need to succeed, learning will be optimized for the whole class (Nolen, 2003).

As to how educators should implement instruction based on multiple intelligences, there are three aspects which need to be discussed. The first aspect is the identification the individual features of students' multiple intelligences. The second aspect is the instructional strategies which correspond to an individual student's requirements.. The third aspect is the relationship between multiple intelligences instruction and error treatment.

Firstly, Gardner (1993) states that it is very important for a teacher to take individual differences between students very seriously. The bottom line is a deep interest in children and how their minds are different from one another, and helping them use their minds well. More specifically, Lash (2004:13) suggests, "In order to

assist our children in getting the most from their learning experiences, we must first identify the areas of intelligence in which each child excels."

It is an important task for the practitioner who desires to study instruction based on multiple intelligences to know each student well. Currie (2003) addresses a dire need for ESL teachers to identify their students' strengths and weaknesses in order to make a greater impact on their language learning. She argues that teachers should encourage students to use their strengths, which can be identified by giving a simple MI questionnaire, in order to make the learning process more accessible. Though both interviews and questionnaires can be used to evaluate a student's learning preferences and multiple intelligences, usually a questionnaire is the first choice due to its greater accuracy and convenience.

Secondly, it is worth noting, however, that no one set of multiple intelligence strategies will work best for every student in the class because all students have different strengths and weaknesses in the eight intelligences (Stanford, 2003). Even if students display similar strengths in a particular intelligence, they may not reach success in the same way (Hatch, 1997). Therefore teachers may have to adjust the instructional strategies they use throughout the day to fully incorporate a multiple intelligence perspective and meet the needs of each individual student (Nolen, 2003). Along with adjusting instructional strategies, Stanford (2003) believes that instructors should shift their intelligence emphasis from one presentation to another, so there will

be time during a day when a student's most highly developed intelligence is actively involved in learning.

According to Puchta and Rinvolucri (2005) there are nine teaching tricks which match the nine intelligences.

1. For those who are strong in existential intelligence, they recommend to let students connect the subject matter to aspects of life on earth, to speculate on life on another planet, and to let them think where living things go after they die, to find out who were the famous philosophers and their thoughts about life and human beings, etc.

2. For those who are strong in bodily-kinesthetic intelligence, they suggest creating a movement or sequence of movements to explain the knowledge, make tasks or puzzle cards, build or construct models or samples, plan and participate in a field trip.

3. For those who are strong in interpersonal intelligence, they suggest conducting a meeting to address an audience, intentionally using social skills to learn about, participate in a service project, teach someone, or practice giving and receiving feedback on the use of technology.

4. For those who are strong in intrapersonal intelligence, they suggest describing qualities you possess that will help you successfully complete a task, set and pursue a goal, describe one of your personal values about an issue, write a journal entry, or assess your own work.

5. For those who are strong in linguistic intelligence, they suggest using storytelling to explain, conduct a debate on issues or ideas, write a poem, myth, legend, short play, or news article, create a talk show on a radio program about a particular subject, or conduct an interview on a topic.

6. For those who are strong in logical-mathematical intelligence, they suggest translating a process into a mathematical formula, designing and conducting an experiment, making up syllogisms to demonstrate a truth function, making up analogies to explain, or describe patterns or symmetry.

7. For those who are strong in musical intelligence, they suggest giving a presentation with appropriate musical accompaniment, sing a rap or song that indicate the rhythmical patterns, explain how the music of a song is similar to a particular subject, or make an instrument and use it to demonstrate the patterns or similarity.

8. For those who are strong in naturalist intelligence, they suggest creating observation notebooks, describing changes in the local or global environment, caring for pets, wildlife, gardens, or parks, using binoculars, telescopes, microscopes, or magnifiers, and drawing or photographing natural objects.

9. For those who are strong in spatial intelligence, they suggest charting, mapping, clustering, or drawing graphs, creating a slide show, videotape, or photo album, illustrating, drawing, painting, sketching, or sculpting, or inventing a board or card game to demonstrate the knowledge.

Thirdly, there has been an uptrend in the application of multiple intelligences theory into the study of foreign language learning and teaching recently. For example, Arnold & Fonseca (2004) who studied multiple intelligence theory and foreign language learning from a brain-based perspective; Akbari & Hosseini (2008) who explored the possible relationship between multiple intelligences and language strategies. Some studies that were involved inmultiple intelligences theory, shed light on the present research in the light of diverse views. For instance, Mahdavy (2008) finds among the multiple intelligences, only linguistic intelligence contributes to listening proficiency. Moreover, Loredana and Aneliz (2011) use interactive multiple intelligence tasks to support the EFL learners, which leads to good pedagogical results.

2.3 Summary

This chapter provides an overall picture of recent research on error analysis and error treatment, which will facilitate further study even though some parts of the literature are not complete, such as the relationship between multiple intelligence based instruction and error correction because of the scarcity of studies on it and limited resources. In the next chapter, the theoretical framework, research design and methodology of this study will be discussed.

CHAPTER 3
THEORETICAL FRAMEWORK, RESEARCH DESIGN AND METHODOLOGY

This chapter begins with an introduction, then continues with the theoretical framework, and lastly is followed by the research design and research methodology. The research design covers explanations of two general designs; the research methodology includes the research methods, subject sampling, measurement, data collection and data analysis.

3.1 Introduction

Social advances depend on the contributions made by systematic research; thus research is often treated as the foundation of scientific progress. Any research purports to answer questions and acquire new knowledge, or put differently, explain the world. Research as an indispensable tool to expand the scope of human knowledge is being used in every field of science including EFL teaching and learning.

However, there remains a fundamental difference between the efforts to explain the world by scientific and non-scientific or pre-scientific ways of research characterized in modern and traditional society. According to Gardner (1993:361), “The adoption of scientific and technological measures has made possible unprecedented

affluence (as well as numerous unanticipated physical and social upheavals): no corner has escaped its effects or its appeal."

Although scientific research can be diverse in each field of science, the general goals of research are universal across disciplines, i.e. describing a thing or event, discovering the relationship between phenomena, or making predictions about future events, or in short, description, explanation, and prediction. In addition, some defining characteristics of scientific research are shared in all fields of study, such as testing hypotheses, careful observation and measurement, systematic evaluation of data, and drawing valid conclusions (Marczyk et al., 2005). On the contrary, non-scientific or pre-scientific research does not involve procedures using hypotheses and the manipulation of conditions, as well as the open possibility that a hypothesis under specific conditions can be rejected or accepted. Instead, in such research all premises have been claimed in advance, so what is left for the researcher is to obtain new information and justify his inferences following previous determinations.

The present research is systematic research which attempts to answer related questions and to test hypotheses on grammatical errors and multiple intelligences, with the characteristics of scientific methods.

3.2 Theoretical Framework

Gardner's Multiple Intelligences theory has profound implications for education in general. More specifically, it has led to all kinds of trials of applications of his theory into language teaching and learning.

As far as foreign language learning is concerned, some empirical studies have already been done to investigate the relationship between language learning and IQ, which was initially a test designed by a Frenchman, Alfred Binet, at the beginning of the 20th century for the purpose of sifting out retarded children from normal ones and placing them at their appropriate grade level. Later on, the various versions of the IQ test became available for widespread use. Historically, considerable progress was made in that human intelligence that was originally an abstract idea could be crystallized for the first time into the form of a numerical parameter – intelligence quotient or IQ. But it is not a panacea; its major defect lies in the fact the traditional IQ test measures only linguistic and math-logical abilities by using pen and paper. For example, Gardner & Lambert (1972), Skehan (1998), and some others demonstrate a low prediction of successful learning of foreign languages using IQ. Since one of the main symbols among others for successful learning of foreign languages is the reduction of grammatical errors in writing, the corollary is that there exists a low prediction of grammatical errors using IQ. The multiple intelligences theory offers an alternative model instead of IQ to study the relationship between intelligences and errors.

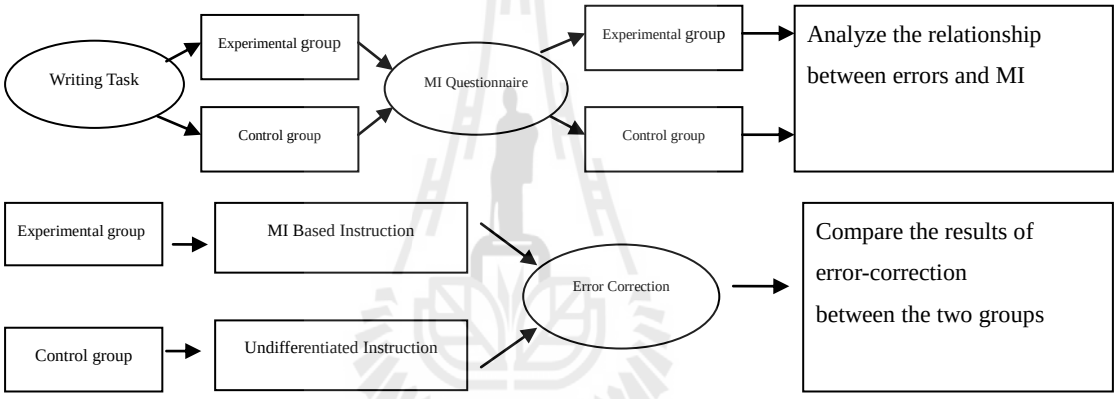
In the case of foreign language teaching, traditionally, whether in an explicit or implicit manner, many teachers have taught as if all learners were the same. However, an increasingly popular learner-centered philosophy is pushing the teacher to improve on this teaching method. Arnold & Fonseca (2004) suggest one of the most significant

advances in education in the last decades of the twentieth century has come from a considerable amount of research done in the area of learning styles, which recognizes that the students in our classrooms have greatly different learning profiles. Therefore, the multiple intelligences theory is a timely recipe.

For both learners and teachers, learning and teaching grammar is an unavoidable problem. More often than not, grammatical errors are systematic and reflective of learners' interlanguage. With regard to teachers, grammar instruction is indispensible in the classroom. Moreover, grammatical errors which appear in writing, unlike speaking, are easy to capture, to analyze and redress. Thus, the study of grammatical errors with multiple intelligences becomes both necessary and possible. With this necessity and possibility, the researcher is interested in further investigation of the relationship between learners' multiple intelligences and language ability in grammar, and the relationship between the error correction rate and instruction based on multiple intelligences .

The theoretical framework is shaped by reasoning. According to Gardner (1993), reasoning originated from the time of Aristotle when people started attempting to comprehend the world by using two kinds of reasoning: deductive reasoning and inductive reasoning. The theoretical framework characteristic of inductive reasoning takes root when conclusions or implications are arrived at from an analysis of the individual cases in a study. Otherwise, the theoretical framework characteristic of deductive reasoning is used in this study. In the investigation of the relationship of,

either between learners' multiple intelligences and language ability in grammar, or between error correction rate and multiple intelligence based instruction, the conclusion and implications of the study emerge from the data collected and examined without imposition by the researcher. Thus, the present study is structured upon a theoretical framework in the wake of inductive reasoning. Figure 3.2.1 shows the research concepts underlying the theoretical framework.



(UD means undifferentiated)

Figure 3.1 Research Concepts underlying the Theoretical Framework

In the above figure, circles represent instruments, short rectangles stand for groups, middle rectangles represent intervention, and the biggest rectangles stand for analysis and comparison. The whole process is composed of two sub - processes. The first sub – process starts from giving a writing task to the two groups and ends in an analysis of their relationship. The second sub – sub - process begins from two groups receiving different instructions and concludes with a comparison of results.

3.3 Research Design

According to Marczyk et al. (2005), research designs are classified into three categories: experimental, quasi-experimental, and non-experimental in general. Trochim (2001) indicates that to determine the classification of a particular research design, it is helpful to ask several key questions. First, does the design involve random assignment to different conditions? If random assignment is used, it is considered a randomized, or true, experimental design. If random assignment is not used, then a second question must be asked: Does the design use either multiple groups or multiple waves of measurement? If the answer is yes, the design is considered quasi-experimental. If the answer is no, the design would be considered non-experimental. Figure 3.3.1 shows the identification process of the research design pattern.

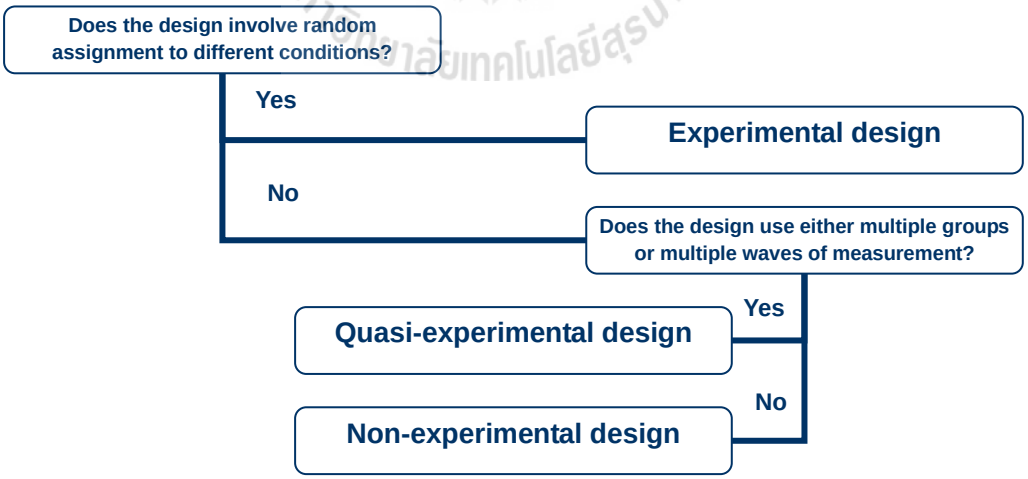


Figure 3.2 Identification Process of the Research Design Pattern

When the study tries to answer questions one, two, and question three, the research design is considered non-experimental because neither randomization nor multiple groups or multiple waves of measurement are involved. When the study examines question four, the research design is viewed as quasi-experimental, because though randomization fails to realize, either multiple groups or multiple waves of measurement are employed.

Moreover, Leary (2004) categorizes behavioral research into four broad categories: descriptive, correlational, experimental, and quasi-experimental. In the light of his classification, question 1 and question 2 are descriptive, question 3 is correlational, and question 4 is quasi-experimental. Leary's categorization has no radical differentiation from Marczyk's, except that Leary breaks down the non-experimental into sub-branches of the descriptive and the correlational.

Best (1970) explains that descriptive research is concerned with how what is or what exists is related to some preceding event that has influenced or affected a present condition or event. Leary (2004) adds that although several kinds of descriptive research may be distinguished, surveys are, by far, the most common type of descriptive research. In survey research, respondents provide information about themselves by completing a questionnaire, answering an interviewer's questions or by some other means. Information from a survey will answer question one and question two of the study.

Cohen et al. (2005) interpret correlational research as a quantitative method in which two or more quantitative variables from the same group of subjects are examined to determine if there is a relationship between the two variables. Theoretically, any two quantitative variables can be correlated, but only those that are significant in a statistical sense are accountable. The solution of question three actually involves the inspection of two variables and their dependence.

Marczyk et al. (2005) suggest an experimental research design with random assignment is the best way to ensure the internal validity of a research study, and the only way to induce a cause and effect conclusion. But this is often not feasible in real-world environments. When it is the case, a quasi-experimental research becomes an opportune choice, as in the present study which lacks randomization. According to Marczyk et al. (2005:138), "Cook and Campbell (1979) present a variety of quasi-experimental designs, which can be divided into two main categories: nonequivalent comparison-group designs and interrupted time-series designs…Nonequivalent comparison-group designs are among the most commonly used quasi-experimental designs...With careful analysis and cautious interpretation, however, nonequivalent comparison-group designs may still lead to some valid conclusions (Graziano & Raulin, 2004)."

Based on Marczyk et al. (2005), nonequivalent comparison-group designs, including nonequivalent groups posttest-only design and nonequivalent groups pretest-posttest design, are used in the experimental and control groups, usually two

intact groups without randomization, which are assumed to be similar. The present research adopts nonequivalent groups (two intact classes) with a pretest and a posttest design, the dependent variable, which is the error correction ability of the EFL learners, is measured both before and after the treatment or intervention, as depicted below:

NR—O—X 1—O

NR—O—X 2—O

NR stands for non-randomization.

O stands for observation.

X1 and X2 stands for different interventions.

3.4 Research Methodology

An essential interest of any science is to find the hidden laws or regularities in the physical and social world through systematic methods. Such systematic methods used in gathering and analyzing evidence are research methods (Ruane, 2006).

It is important to recognize that research methods play an important role in both our understanding of and implementation of scientific research. Ruane (2006: 6) points out, “An understanding of research methods allows us to become critical consumers of information. Understanding research methods allows us to assess the wealth of information we receive each day in the light of some very discerning standards.” Additionally, in order to make a research replicable, or in Ruane’s terms,

trustworthy, the application of scientific research methods is pre-requisite. Being capable of replicating research findings will, to a great extent, prevent false conclusions being reached in too much a hurry.

There are two kinds of research methods: qualitative and quantitative. As Marczyk, et al. (2005) explain, quantitative research involves studies that make use of statistical analyses to obtain their findings, and the key features include formal and systematic measurement and the use of statistics; qualitative research involves studies that do not attempt to quantify their results through statistical summary or analysis. Therefore, qualitative studies typically involve interviews and observations without formal measurement. A case study, which is an in-depth examination of one person, is a form of qualitative research. Qualitative research is often used as a source of hypotheses for later testing in quantitative research. Miles & Huberman (1994) made a more detailed comparison between the two as follows:

Table 3.1 Comparison between Qualitative and Quantitative Research

Qualitative	Quantitative
All research ultimately has a qualitative grounding.	There is no such thing as qualitative data. Everything is either 1 or 0.
The aim is a complete, detailed description.	The aim is to classify features, count them, and construct statistical models in an attempt to explain what is observed.
Researcher may only know roughly in advance what he/she is looking for.	Researcher knows clearly in advance what he/she is looking for.
Recommended during earlier phases of research projects.	Recommended during latter phases of research projects.
The design emerges as the study unfolds.	All aspects of the study are carefully designed before data is collected.
Researcher is the data gathering instrument.	Researcher uses tools, such as questionnaires or equipment to collect numerical data.
Data is in the form of words, pictures or objects.	Data is in the form of numbers and statistics.
Subjective & individual interpretation of events is important, e.g., uses participant observation, in-depth interviews etc.	Objectively seeks precise measurement & analysis of target concepts, e.g., uses surveys, questionnaires etc.
Qualitative data is richer, time consuming, and less genaralizable.	Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail.
Researcher tends to become subjectively immersed in the subject matter.	Researcher tends to remain objectively separated from the subject matter.

In this study, all the answers to the four research questions involve precise numerical objectivity. The research questions will be answered quantitatively, and statistical analyses will be applied to obtain the results. Therefore, the research method in the study is quantitative in nature. For instance, research questions are

clearly described, the grammatical errors in the writing task will be identified and counted, and the multiple intelligences collected through the questionnaire will be numerically recorded. In short, the choice of quantitative method is decided by the nature of the research, because all the statistical techniques such as descriptive description, correlation and t-tests that will be used to answer the research questions are applicable only to a quantitative study. Although there is indeed some qualitative description, such as the description of types of grammatical errors, the conditions of multiple intelligences, and even a semi-structured interview to decide the type of writing task and modifications of the questionnaires, these are subordinate to the general goal of the study and cannot answer any research question directly.

3.5 Subjects Sampling

As defined by Ruane (2006:43), "Sampling refers to the process whereby we study a few in order to learn about the many." Sampling that literally means sample selection is a concept relative to population – the whole research subject. Sampling is an extremely important task in research because in many research studies the study of the whole population is either impossible or unnecessary.

There are two main methods of sampling: probability sampling, also known as random sampling, and non-probability sampling, also known as purposive sampling (Cohen & Holliday, 1979, 1982, 1996; Schofield, 1996). The difference between them is this: in a probability sample or random sample, the chances of members of the wider population being selected for the sample are known, whereas in a

non-probability sample or purposive sample, the chances of members of the wider population being selected for the sample are unknown.

Usually a small-scale research study uses non-probability samples in spite of their non-representativeness, because they are far less complicated to set up, are considerably less expensive, and can prove perfectly adequate. This is especially the case when researchers do not intend to generalize their findings beyond the sample in question (Cohen et al., 2005).

Confined by the educational setting and with no intention to universalize the present discoveries, the researcher adopted the non-probable or purposive sampling, intended to provide reference to and pin hopes on a future study. The subjects included in the present study came from Guangzhou Automobile College of China. Seventy-four first-year English majors were chosen to participate in the study. They come from two classes. By drawing lots, class one with 36 students was designated as the control group, and class two with 38 students was specified as the experimental group. They were all enrolled in 2009, and the researcher was their English teacher.

Although a strict probability sampling helps control extraneous influences, minimizes the impact of selection biases, and increases the external validity of the study, this was not possible in the present study, because the researcher was teaching in an institute of science and technology where students of liberal arts are rare. In fact, there were altogether two classes of freshmen for English majors recruited in the academic year 2009. However, to some extent, a mild probable sampling has been

carried out unintentionally because the students in each class are freshmen who are had already been randomly assigned without particular consideration after matriculation. Conservatively, the researcher does not term it as probable sampling to avoid unnecessary inquiry and suspicion. Otherwise, such research would be a perfect experimental study.

Besides the above reasons, there are other causes for this choice. Firstly, the freshmen of a similar age group with similar educational background are uncontaminated by previous pedagogical interferences before their matriculation. Secondly, the newly enrolled students will be less likely to drop out from the study due to lack of motivation and self-discipline. Thirdly, the students who come from two intact classes actually are representative enough themselves, even though they may not represent the wider population.

3.6 Measurement

Measurement can be defined as a process through which researchers describe, explain, and predict the phenomena and constructs of our daily existence (Pedhazur & Schmelkin, 1991). When making measurements in the context of research, the researcher typically takes great precautions to avoid making biased observations. The importance of measurement cannot be overstated. Suitable measurement levels and measurement approaches will guarantee the relevancy and accuracy in the data collection and data analysis. In fact, statistics is a set of techniques used to analyze collected data that are numerically transformed information from the measurement of

variables, i.e. empirical representations of concepts. To facilitate the measurement of the variable, whether it can be described or subjected to a statistical process, the concept of measurement at different levels becomes essential. There are 4 levels of measurement: nominal, ordinal, interval, and ratio. They are hierarchical in nature from the basic to the advanced. Ruane (2006) explains their nature as follows: 1) The nominal level of measurement that identifies only qualitative differences. The numbers attached to values are merely used to label the differences between the values of each variable; 2) The ordinal level of measurement that is used to indicate rank order. The numbers attached might also indicate a ranking or ordering of the values of each variable; 3) The interval level of measurement that builds on ordinal measurement. The numbers attached provides information about both order and distance between the values of variables; 4) The ratio level of measurement that is the highest level of measurement and allows for the use of sophisticated statistical treatment with data attached. Usually the measurement of abstract concepts should be realized with specific instruments such as questionnaires, interviews, and tests. The instruments that are used for measurement must satisfy the reliability and validity, which is discussed in the following section.

3.6.1 Instrument Reliability

According to Andrich (1981) and Leary (2004), at its most general level, reliability refers to the consistency or dependability of a measurement technique. More specifically, reliability is concerned with the consistency or stability of the score

obtained from a measurement or assessment technique over time and across settings or conditions (Anastasi & Urbina, 1997; White & Saltz, 1957). If the measurement is reliable, then there is less chance that the score obtained is due to random factors and measurement error.

Numerous practical approaches can be used alone or in combination to minimize the impact of measurement error. First, the administration of the instrument or measurement strategy should be standardized - all measurement should occur in the most consistent manner possible. In other words, the administration of measurement strategies should be consistent across all of the participants taking part in the study. Second, the researchers should make certain that the participants understand the instructions and contents of the instrument or measurement strategy. Third, every researcher involved in data collection should be thoroughly trained in the use of the measurement strategy. There should also be ample opportunities for practice before the study begins and repeated training over the course of the study to maintain consistency. Finally, every effort should be made to ensure that data are recorded, compiled, and analyzed accurately (Leary, 2004).

In brief, when we say an instrument is reliable, we mean the results measured repeatedly by the instrument will produce the same result.

3.6.2 Instrument Validity

Although reliability is a necessary and essential consideration when selecting an instrument or measurement approach, it is not sufficient in and of itself. Validity is

another critical aspect of measurement that must be considered as part of an overall measurement strategy (Dowdy, Weardon & Chilko, 2004). Whereas reliability refers to the consistency of the measurement, validity points to what the test or measurement strategy measures and how well it does so (Anastasi & Urbina, 1997). Therefore, the conceptual question that validity seeks to answer is whether the instrument measures what it is supposed to measure. A measurement cannot be valid unless it is reliable in that validity and reliability are interconnected concepts (Sullivan & Feldman, 1979). In other words, what is measured by an instrument can be reliable but not valid if measurement occurs.

The most common methods for demonstrating validity include the assessments of content-related, criterion-related, and construct-related validity (Campbell, 1960). Content-related validity refers to the relevance of the instrument or measurement strategy to the construct being measured (Fitzpatrick, 1983). The approach for determining content validity starts with the operationalization of the construct of interest. Criterion (concurrent or predictive) validity focuses on how well the instrument comparing external variables is considered to be a direct measurement of the characteristics or behavior being examined. Intelligence test scores used to predict future performance are an example of criterion validity. The outside criterion or measure should be related to the construct of interest, and it can be measured at the same time as the measurement is given or some time in the future (Isaac & Michael, 1995). Construct validity involves the extent to which certain explanatory concepts or

qualities account for performance. A simple way of thinking about it is as a test of generalization. It assesses whether the variable that you are testing is addressed by the experiment (Groth-Marnat, 2003).

In short, when we claim an instrument is valid, we are saying that we have been successful at measuring what we need to measure with the instrument.

3.6.3 Instruments for Data Collection

Complicated as the issue of reliability and validity is, the instruments adopted in the study are both reliable and valid in general. There are three instruments included in the study: a writing task, a questionnaire, and an error correction test, which will be discussed below.

3.6.3.1 Writing Task

To draw out errors, the writing task employed in the study for both the control group and the experimental group was a controlled composition, which had the following requirements:

1) Topic: Learn by Yourself or with a Teacher?

2) Tips: Some people think that they can learn better by themselves than with a teacher. Others think that it is always better to have a teacher. Which do you prefer? Use specific reasons to develop your essay.

3) Length: Around 120 words.

4) Time: 60 minutes.

The writing task is of high reliability: firstly, it had standardized requirements for all participants, and every student in the study wrote in a consistent manner; secondly, each student was well informed about the requirements orally and in written form to ensure all of them were clear about what to write and how to write. Thirdly, the time given to write an article, which was 60 minutes, was enough for the students to check and correct their mistakes after writing.

The writing task is also highly valid for the following reasons. First, the writing task met content-related validity in that the activity of the controlled composition was relevant to the grammatical errors. Second, the task satisfied criterion-related validity since the students' compositions can be used as a direct measurement to elicit independent variable - grammatical errors. Third, the task caters for construct-related validity owing to the fact that grammatical errors are manifested in either speaking or writing. The writing task was a proper way to accurately capture those errors.

3.6.3.2 Questionnaire

Questionnaires are perhaps the most frequently employed measurements in social studies. According to Dawson (2002), there are three basic types of questionnaire: closed-ended, open-ended or a combination of both. A closed-ended questionnaire is used to generate statistics in quantitative research, since the questionnaire follows a set format, and the response options can be coded into number and input into a computer for analysis. An open-ended questionnaire on the contrary is

used in qualitative research, although some researchers will quantify the answers during the analysis stage. The questionnaire does not contain boxes to tick, but instead leaves a blank section for the respondent to write in an answer. A questionnaire which combines closed-ended and open-ended questions allows the researcher to obtain both qualitative and quantitative data. The closed-ended and open-ended questionnaire each has its own advantages as well as disadvantages as summarized by Dawson (2002) in the following table.

Table 3.2 Comparison between Open and Closed Ended Questionnaire

Open-ended Questionnaire	Closed-ended Questionnaire
Tends to be slower to administer.	Tends to be quicker to administer.
Can be harder to record responses.	Often easier and quicker for the researcher to record responses.
May be difficult to code, especially if multiple answers are given.	Tends to be easy to code.
Does not stifle response.	Respondents can only answer in a predefined way.
Enables respondents to raise new issues.	New issues cannot be raised.
Respondents tend to feel that they have been able to speak their mind.	Respondents can only answer in a way which may not match their actual opinion and they may, therefore, become frustrated.
Respondents might not be willing to write a long answer and decide to leave the question blank.	Is quick and easy for respondents to tick boxes – might be more likely to answer all the questions.
Can use open questions to find out all the possible responses before designing a closed-ended questionnaire.	Can include a section at the end of a closed-ended questionnaire for people to write in a longer response if they wish.

After the writing task, the subjects were expected to answer questionnaires. Closed-ended questionnaires were used, inasmuch as what was to be collected and

examined were numerical data at the end in the study. As discussed above, the research method is quantitative, so all the digital data collected through the questionnaire and from the writing task were input into a computer and analyzed using SPSS to obtain the research results.

The questionnaires that can be used in the research were the Multiple Intelligences Questionnaire developed by Walter McKenzie in 1999 and another similar one composed by Greg Gay in 1998, both of which were publicly available online free. The obvious difference between the two questionnaires lies in the fact that one investigates the nine intelligences whereas the other investigates only eight. In order to take full account of the latest developments in the field, the questionnaire that measures the nine intelligences was given priority in this study.

There are three ways to test and verify its reliability and validity before its application in the study. Firstly, reliability would be demonstrated by similar results from a small sample of subjects who are administered the questionnaire at different time. Secondly, reliability could be measured by Cronbach's alpha coefficient after data collection. Thirdly, validity could be demonstrated by the use of experts in the field. In other words, if what the questionnaire output reveals completely matches the known intelligence of an expert, then the questionnaire is deemed highly valid. For instance, if the result by a questionnaire shows an excellent language teacher is particularly strong in linguistic intelligence, then the questionnaire is of high validity. The reliability and validity was tested and verified in the pilot study.

3.6.3.3 Error Correction Test

Tests as instruments have a long history and extensive use especially in language study on the grounds that testing techniques grant researchers a powerful yet flexible method at their disposal.

Cohen (2005) notes tests are classified as parametric or nonparametric depending on the distribution of the test takers. If the population that takes the test are large enough and the test scores display normality, such a test is parametric; otherwise the test is nonparametric. Moreover, there exist aptitude tests and achievement tests. Aptitude tests are considered predictive, a way of indicating the likely future performance of the individual tested in a particular subject area or discipline. Achievement tests, in comparison, test an individual's knowledge in the subject areas the individual has studied, and measure the actual acquired knowledge of that subject area. In addition, tests have been categorized into norm-referenced, criterion-referenced and domain-referenced ones relying on the testing reference. The three tests are different in that a norm-referenced test compares test takers' achievements with each other, a criterion-referenced requires the student to fulfill a given set of criteria, a predefined and absolute standard or outcome, and in a norm-referenced test, the test taker's achievements on that test are computed to yield a proportion of the maximum score possible (Cunningham, 1998).

In the present study, the population attending the error correction test was small, 74 students of two groups altogether. The aim of the test was to measure the

students' degree of mastery of grammar knowledge after two kinds of instruction. The test scores resulting from the two groups were compared at the end. Thus, the error correction test is a nonparametric, norm-referenced achievement test.

Similar to the writing task, the error correction test was also of high **reliability. Firstly, it had standardized requirements for all students. Every student in** the study was tested in the same way with the same examination paper. Secondly, each student was well informed about the requirements orally and in written form to ensure all of them were clear about what to write and how to do the error correction test. Thirdly, the students were given enough time to check and correct their mistakes for the test.

The error correction test is also highly valid for the following reasons. First, the test met content-related validity in that all the errors in the test for correction were extracted and adapted from the previous writing task. Second, the test satisfied criterion-related validity since the test results of the error correction test can be used as a direct measurement to indicate the test takers' error performances. Third, the test catered for construct-related validity owing to the fact that the test takers' error performances were germane to the test results. In other words, the error correction test did assess the test takers' error performances.

3.7 Data Collection Method

Research data can be seen as the fruit of a researcher's labor. If a study has been conducted in a scientifically rigorous manner, the data will hold the clues necessary to answer the researchers' questions (Marczyk et al., 2005). When the research design, subject sampling, and instruments were ready, it was the time to establish a general procedure to collect data. The sequence of the data collection process followed the order of the hypotheses.

In the first step of the data collection, a writing task was administered to all students for both the experimental group and the control group, and then they were expected to answer questionnaires on multiple intelligences. The grammatical errors elicited from the writing were counted and compared with characteristics of their multiple intelligences extracted from the questionnaire to approve or disprove hypothesis one which is to see if there is a relationship between the EFL learners' multiple intelligences and the types of errors.

To be specific, during the writing task, the students were expected to finish the tasks independently, and were encouraged to do a self-check before submitting their work. After the writing task, the questionnaires were distributed to be completed by the students and recycled on the spot by the researcher. The grammatical errors from the writing task were identified, classified, counted and transcribed numerically with the help of peer researchers who acted as consultants when problems arose and double-checkers of the statistical calculations and research findings.

In the second step, the special error treatment was applied to the students of the experimental group and the students of the control group were left with the traditional pedagogy. The traditional treatment carried out for the control group was explicit instruction which pointed out what type of grammatical errors were made by the students accompanied by examples of the correct forms, whereas the special treatment applied to the experimental group was a multiple intelligences based instruction, i.e. diversifying the instructions to tailor each student's particular multiple intelligences.

In the third step, an error correction test was applied to the two groups. With the technical assistance of the peer researchers, the test papers were marked and the average numbers of successful error correction by the two groups were computed and recorded and the average scores of which were compared after the test to determine if hypothesis two, that the multiple intelligences based instruction does not make a difference, could be rejected or not.

It is worth mentioning that the interval between the administration of the two kinds of error treatment was shortened as much as possible to avoid the Hawthorn effect which is that the existence of two error treatments make them unduly motivated or frustrated. The Hawthorne effect refers to improvement in performance solely due to the subject's knowledge that he or she is being studied (Fox.et al., 2008). In addition, the interval between error treatment and error correction was reduced as much as possible in case of the intervention of alternative variables other than the error treatment. Too long an interval may invite extraneous effects to distort the data, such as

maturation in students, outside influences on the students, etc. However, too short a time span is problematic in that the respondents may remember what they have been taught though the knowledge is not really internalized implicitly.

3.8 Data Analysis Method

The ways in which research hypotheses can be tested and research questions can be answered depend largely upon the methods of the data analysis. The data analysis methods involved various statistical techniques.

As Dowdy et al. (2004) suggest, statistical procedures can be broken down into two major areas: descriptive and inferential. In terms of function, descriptive statistics allow the researcher to describe the data and examine relationships between variables, while inferential statistics allow the researcher to examine the causal relationship. With regard to measurement, descriptive statistics measures central tendency (related to median or mode or mean), dispersion (related to range or deviation or frequency or percentage) and correlation (related to correlational coefficient or coefficient of determination), whereas inferential statistics estimates difference, discrepancy and makes prediction, which could be realized through performance of a t-test or ANOVA, Chi-Square or regression calculation.

For questions one and two of the study asking about the frequencies or percentages and deviations, the statistics technique used was descriptive. Question three, which attempts to identify the relationship between the two variables – the error and the intelligence was also descriptive in nature. However, question four was

different in that it intended to examine the differences, if any, with or without special treatment being applied to the two groups. The demonstration of statistical differences was carried out by using independent samples t-test, which belongs to inferential statistics.

3.8.1 Frequency Distribution

Frequency distribution as a task of descriptive statistics is simply a complete list of all possible values or scores for a particular variable, along with the number of times (frequency) that each value or score appears in the data set (Marczyk, DeMatteo & Festinger, 2005).

Answering question one entailed the calculation of the means of the errors to compare and the frequencies and percentages of the errors. Similarly, answering question two involved the computation of frequencies, percentages and the standard deviations to describe the characteristics of the intelligences. Moreover, the combination of the frequency results of question one and question two was the precondition to verify the correlational hypothesis for question one and to find the answer to question three, which are related to the relationship between grammatical errors and multiple intelligences.

3.8.2 Correlations

Another important task of descriptive statistics is correlation analyses that examine and describe the relationships between variables. Unlike measurements of frequency distribution, correlations can be tested for statistical significance. The

primary index of statistical significance is sig. value. The sig. value represents the probability of chance error in determining whether a finding is valid. If the sig. value is large, we conclude the data are consistent with the null hypothesis. If the sig. value is small, then either the null hypothesis is false or the null hypothesis is true and a rare event has occurred (Dowdy, Weardon & Chilko, 2004). Usually the sig. value of 0.05 is taken as a key point. If the sig. value≤0.05, the research finding is significant and the null hypothesis can be rejected. Otherwise, the null hypothesis may be true.

Marczyk, DeMatteo & Festinger (2005) divide correlations into five types:

1) Pearson correlation: This is used to examine associations between two variables that are measured by either ratio or interval scales.

2) Point-biserial (rpbi): This is used to examine the relationship between one variable measured on a naturally occurring dichotomous nominal scale and one variable measured on an interval (or ratio).

3) Spearman rank-order (rs): This is used to examine the relationship between two variables measured on ordinal scales.

4) Phi (Φ): This is used to examine the relationship between two variables that are naturally dichotomous.

5) Gamma (γ): This is used to examine the relationship between one nominal variable and one variable measured on an ordinal scale.

In the present research, hypothesis one and question three associated the investigation of the relationship between the EFL learners' multiple intelligences and

frequencies and types of errors. The two variables in hypothesis one and question three are the EFL learners' multiple intelligences and the types of errors. Because both sets of variables – the multiple intelligences and the types of errors - were measured in interval scale, the Pearson correlation technique in statistics was used in this study.

To answer question three, hypothesis one should be tested first. Inputting into SPSS the descriptive data of multiple intelligences and types of errors to carry out a correlational analysis, the researcher checked the probabilities of chance errors, i.e. the sig. values. If a particular sig. value ≤ 0.05 occurs, we are 95% confident to say that there is a null hypothesis and that there is not any relationship between the EFL learners' intelligence and the type of errors. Thus, there is a relationship between them. The value of correlations varies between –1.0 to +1.0. The positive mark stands for the pair of variables being positively related whereas the negative mark means they are negatively related. Whether the value of the relationship is positive or negative, usually when the absolute value is between 0.01 and 0.30, the relationship is considered small, 0.30 and 0.70 moderate, 0.70 and 0.90 large, and 0.90 to 1.00 very large.

If a sig. value >0.05, the whole thing will be simple, for the null hypothesis may be true, i.e. probably there is not any relationship between the EFL learners' intelligence and the type of errors. In that case, there is no need to investigate the strength and the direction of the relationship of the two variables.

3.8.3 T-tests

T-tests as a task of inferential statistics allow the researcher to examine causal relationships. They are used to test mean differences between two groups in terms of the number of errors. In general, they require a single dichotomous independent variable and a single continuous dependent variable. For example, independent-samples t tests can be used to test for mean differences between experimental and control groups in a randomized experiment, and one-sample t-tests can be used to test for mean differences within one group in a non-experimental context. When a researcher wishes to compare the average (mean) performance between two groups or within one group on a continuous variable, he or she should consider either independent samples t-tests or one sample t-tests (Marczyk et al., 2005).

Like the function in correlation, the sig. value is essential to test if the hypothesis two is null or not. Inputting error correction scores into SPSS to do the independent samples t-test, the researcher was able to check the sig. value of Levene's test. Only when the sig. value ≤ 0.05, could the difference between the two groups be considered of significant difference statistically. In other words, we are very confident of the null hypothesis - that the multiple intelligences based instruction makes no difference to the students' performance of error-correction and it can therefore be rejected. Thus, question four would get an affirmative answer. Otherwise, the opposite answer would stand.

3.9 Summary

To sum up, this chapter proposes a theoretical framework, a research design, subject sampling and the research methodology. Included in the research methodology are introductions to instruments and methods of data collection and data analysis. The next chapter will discuss the pilot study with regard to the selection of subjects, the writing task design, the error analysis test, and the assessment of the questionnaire.

CHAPTER 4

PILOT STUDY

A pilot study is a pre-study conducted before a fuller study; a pilot study is also a feasibility study in preparation for a major study. According to Baker (1994: 182-3), "A pilot study is a miniature version of the study designed to pre-test or try out a particular research instrument such as a questionnaire or interview." A pilot study will reveal deficiencies in the proposed procedures or treatments in a pre-conceived design, thus conveying important information and allowing improvement before time and resources are expended on the main study. In brief, a pilot study is so crucial to a good study design that it will fulfill a range of important functions proving insights for other researchers (Teijlingen & Hundley, 2001).

4.1 Purposes of the Pilot Study

The purposes of the pilot study are listed as follows:

1. To select proper subjects for the study.

2. To gather information on the appropriateness of the writing task from the feedback of the participants.

3. To evaluate error analysis in the light of the authentic conditions in the writing samples.

4. To check the validity and reliability of the questionnaires.

5. To record the time taken to complete the writing task and the questionnaire.

4.2 Subjects Selection

English is a compulsory course for all majors in China. In order to make the study of universal significance, the researcher took the non-English major students as the subjects in the initial study design. The first year students are better subjects considering the lower dropout rate due to higher motivation as freshmen have less pressure from curricula study.

At the beginning of the academic term, September 2009, 40 first year students who specialize in mechanical engineering in Guangzhou Automobile College were invited to participate in the pilot study. They were required to do a free writing exercise, which had the following requirements:

1) Write nonstop for a set period of 20 minutes.
2) Write about any topic that interested them and whatever came to mind.
3) Check mistakes and lapses with care during and after writing.

The results were discouraging and disappointing to the researcher. All but 80% of the articles were just words thrown together with no regard for even the basic rules of the language. More often than not, some articles were only a cluster of illegible words scattered on a seemingly huge blank paper. The reason for this phenomenon was made clear, through a focused group discussion, that those students were

inherently weak in English before their enrollment, although they were normally good students in other courses. To some extent their English level influenced their choice of the college and the major. They might have chosen a better college and at least some of them might have switched to liberal arts, if their English knowledge had not been so poor.

The main problem is that there were too many errors in the subjects' writing and those errors were of high consistency. The situation in which most students erred the same way might facilitate the error treatment because with the similar pre-conditions the intervention results would be more obvious. However, for the study of the relationship between errors and multiple intelligences, such a circumstance is anything but an advantage, because no relationship could be detected given the variable multiple intelligences and the invariable errors. The opposite is also true for advanced learners. Therefore, the researcher turned to the first year students of English major. Thanks to colleagues allowing the researcher to have access to the students' writing samples, it was found that the English level of these students was satisfactory, in other words, not too good and not too bad.

4.3 Writing Task Design

Near the mid-term around November 2009, the researcher tried out the writing task design with the new subjects. The chosen subjects were a class of first year English major students, who were selected for the reasons explained above, namely,

that they had low dropout rates and high motivation. They were required to do a free writing exercise in the same way as the mechanical engineering students had done previously. However, the time limit was cancelled because most of those students could not finish the writing task within the specific time as observed by the researcher.

After the writing, the researcher examined the writing samples and found other problems. Although, as expected, the general level of English majors is obviously higher than that of non-English majors, many students wrote short essays, and yet a few wrote very long essays. As we know, it is unavoidable that the more one writes, the more errors one tends to make. Thus, the one who makes a number of errors in his/her short article cannot be compared to the one who makes the same number of errors in his/her longer essay. Allowing such phenomenon would lead to inaccurate and useless statistical results. Moreover, in spite of the fact that some writings are basically suitable as potential corpora that are of high readability and a rich diversity of genres, some of which, such as manuals and advertisements, might make the writer avoid the use of complex and complete sentences. In such cases, the analysis of grammatical errors would become extremely difficult, if not impossible.

In contrast to the researcher's belief that free writing would catalyze the writers' motivation, the feedback from the students showed quite a few of them had difficulty about what to write and how to write even though clear directions were given in both written and verbal form. Influenced by the exam-oriented education and

teacher-centered belief in their secondary education where divergent thinking was suppressed, they spontaneously took for granted that there existed only one correct answer to every question, to which the teacher owned the key. Naturally, they were confused by the lack of detailed descriptive instructions to follow, and they wasted a lot of time vainly trying to infer the teacher's intention, as they usually did, before deciding on their selected topic. Moreover, the time recorded for finishing the writing task ranged from more than fifteen minutes to around one hour. Most of the students, about 70% of them, wrote for more than 20 minutes.

The pilot study for the writing task design revealed that a free writing task was not suitable for freshmen who were trained in convergent thinking from the time they started primary school. The consequences of the free writing were twofold: on the one hand, free writing de-motivated the writers and not, as hoped, the other way around. For them, too many choices equaled no choice. This may partly explain why so many students wrote so little. On the other hand, the free writing design which produced diverse literary forms posed unexpected difficulties for the researcher to analyze. Thus, in the main study the free writing design is modified into a writing task with specific requirements including theme, time and the number of words allowed.

4.4 Error Analysis Test

In spite of all the problems in the free writing task, about 46% of the writing samples are of useable length, and at least 40% of the total is analyzable when those

using an unsuitable genre were rejected. Therefore, the researcher attempted to test the error analysis procedures with the collected writing samples on a smaller scale.

According to Corder (1974), there are five stages in a complete model of error analysis. The five stages include: 1) collection of samples; 2) identification of errors; 3) description of errors; 4) explanation of errors; 5) evaluation of errors.

In stage 1, the collection of samples from EFL learners is actually a process of error elicitation. According to Corder (1973), there are two kinds of error elicitation: clinical and experimental. Moreover, clinical elicitation involves getting the information by means of a general interview or by asking learners to write a composition. The available samples acquired through the free writing task, although low in acceptance rate, is in accordance with the clinical error elicitation method suggested by Corder (1973). Thus, they can be used directly in the pilot study.

In stage 2, identification of errors from mistakes based on Corder's model can be omitted. All errors and mistakes are indiscriminately taken as errors for the purposes of this study. This allowed for greater efficiency, but it was also because the students who took part in the writing task were given enough time to check their work and writers are less likely to make slips or mistakes than when they are speaking.

The most important part of the study began from stage 3, the description of errors. First, the description of errors defines the types of errors that constitute one of the two variables that are error types and multiple intelligences, which lays the foundation for investigating the relationship between the two variables. Second, it

offers an answer to the survey question on what kinds of errors are frequently made by the EFL learners. Third, it provides reference for the design of error correction. The description of errors can be carried out by a combination of linguistic methods and surface strategy taxonomy.

There are three ways of describing errors. The linguistic method proposed by Chamot (1978) from which it is quite difficult to provide a satisfactory description of learners' L2 development in terms of Ellis (1994), is at least capable of minute portrayal of learners' L2 status quo, a kind of picture of the present conditions in static form, which meets the requirements of the study, by quantifying the types of errors. Thus, it is suitable for error description and therefore used in this study. An alternative to a linguistic description of errors is to use a surface strategy taxonomy as proposed by Dulay, Burt and Karshen (1982) by means of which such operations as omissions, additions, misinformation and misorderings can be analyzed. According to Murrow (2005), the operations in the surface strategy taxonomy were renamed as missing, superfluous, incorrect or misplaced, and these categories were adopted for the present study. This mehod of error description was chosen because it was easy to define and to operate. The third method of description as proposed by Corder (1974), who distinguishes three types of errors according to their systematicity, is more concerned with how learners learn an L2. The systematic method was not used for this study as it involves the identification of the EFL learners' awareness of the existence of a particular rule, which is opaque and tricky for the researcher to elucidate, even if it is

known to the learners themselves. The adoption of the linguistic method combined with the surface strategy taxonomy (briefly 'surface' hereinafter) to describe errors made by the EFL learners rather than only using one method in the study made the error description more rigorous and persuasive.

Developing a consistent way of describing errors posed a great challenge for the researcher because there is no up-to-date literature found in the field. Fortunately, the outdated literature does not mean it is not useful. In effect, the methods of error description adopted, which was propounded in the last century, seem to suit the study quite well. Just as the theory of evolution introduced by Darwin's work *On the Origin of Species* in 1859 is not obsolete today one century and a half later, the psychoanalysis theory formulated in Freud's *The Interpretation of Dreams* in 1900 was not accepted until after the Second World War.

Despite the readiness of stage 1 and stage 2 as well as the means with which to describe errors in stage 3, the considerable task of scrutinizing dozens of writing samples was indispensable. In accordance with the actual situation of the EFL learners' writing, and for the convenience of counting the errors and carrying out the analysis, each error found in the subjects' writing was identified as linguistic errors and surface errors simultaneously. The linguistic errors are broken down into 10 types, i.e. errors of auxiliary verb, lexical verb, noun, adjective, adverb, conjunction, article, pronouns, prepositions, and punctuation symbols (According to Crystal (2003), a lexical verb is a member of an open class of verbs that includes all verbs except

auxiliary verbs. Lexical verbs typically express action, state, or other predicate meanings. In contrast, auxiliary verbs express grammatical meaning). The surface errors are categorized into 4 classes: missing errors, superfluous errors, incorrect errors, and misplaced errors. The whole process of error description can be broken down into the following 3 steps:

1) Produce a table of error acronyms as in Table 4.4.1.

2) Use the error acronyms to mark the students' papers.

3) Count the number of errors for each category and enter into a table as in Table 4.4.2.

The use of acronyms will facilitate the counting of errors both in the linguistic category and the surface taxonomy. Table 4.4.1 and Table 4.4.2, which are going to be used in the main study, are ready-made models to record the numbers of the various types of errors for the error analysis itself, for the further analysis of the relationship between error types and multiple intelligences, and for the future error correction design. So, in the end every subject will have a Table 4.4.2, and each group will have a general table like Table 4.4.2 summarizing the contents of all the individual tables.

Table 4.1 Error Acronym

Linguistic Category	Surface Strategy Taxonomy			
	Missing	Superfluous	Incorrect	Misplaced
Auxiliary Verbs	AVMS	AVS	AVI	AVMP
Lexical Verbs	LVMS	LVS	LVI	LVMP
Nouns	NMS	NS	NI	NMSP
Adjectives	AdjMS	AdjS	AdjI	AdjMSP
Adverbs	AdvM	AdvS	AdvI	AdvMSP
Conjunctions	ConjMS	ConjS	ConjI	ConjMSP
Articles	ArtMS	ArtS	ArtI	ArtMSP
Pronouns	PronMS	PronS	PronI	PronMSP
Prepositions	PrepMS	PrepS	PrepI	PrepMSP
Punctuation Symbols	PSMS	PSS	PSI	PSMSP

Table 4.2 Error Numbers

Linguistic Category	Surface Strategy Taxonomy			
	Missing	Superfluous	Incorrect	Misplaced
Auxiliary Verbs	number	number	number	number
Lexical Verbs	number	number	number	number
Nouns	number	number	number	number
Adjectives	number	number	number	number
Adverbs	number	number	number	number
Conjunctions	number	number	number	number
Articles	number	number	number	number
Pronouns	number	number	number	number
Prepositions	number	number	number	number
Punctuation Symbols	number	number	number	number

Stage 4, explanation of errors, is the process of identifying the sources of errors. Based on Brown (2000), four major types of causes contribute to error making. They include: 1) interlingual transfer; 2) intralingual transfer; 3) communication strategies; 4) context of learning. None of these is relevant to this except that of the context of learning. Research question 4 which explores the function of multiple intelligences in

language learning involves the context of learning. Nevertheless, it remains unknown whether or not the element of multiple intelligences, a special context of learning, can explain the source of the errors before a full study is conducted.

Stage 5, evaluation of errors, is omitted in the study because of a lack of standard criteria with which to appraise the seriousness, intelligibility or acceptability of an error.

4.5 Questionnaire Assessment

The data collected through the questionnaire provided information on the subjects' of multiple intelligences. Similar to the description of errors, the information on multiple intelligences is essential to the study. Dornyei (2003: 9-10) states, "The main attraction of questionnaires is their unprecedented efficiency in terms of (a) researcher time, (b) researcher effort, and (c) financial resources…, but there is no doubt that it is very easy to produce unreliable and invalid data by means of ill-constructed questionnaires." Certainly, something should be done to avoid the creation of an ill-constructed questionnaire. Nevertheless, in the case of adoption of a ready-designed questionnaire, as in this study, its validity and reliability assessment become indispensable prior to its application to the main study.

4.5.1 Reliability Assessment of the Questionnaire

The reliability of a questionnaire means the extent of consistency or dependability of the questionnaire. Specifically, a reliable questionnaire refers to a

questionnaire from which the data collected remains consistent and stable over time or across settings.

Leary (2004) states that four strategies are available to ensure the reliability of questionnaires. The first is standardization which means all subjects are administered the same questionnaire. The second is comprehensability which means that all subjects understand the instructions and contents of the questionnaire. The third is consistency which includes external consistency and internal consistency. External consistency means the results of repeated administrations of the questionnaire to the same group at different times are the same or similar. Internal consistency means how closely related a set of items are as a group in the questionnaire, which is indicated by the coefficient of Cronbach's alpha. The fourth is accuracy which means data procured from the questionnaire should be recorded, compiled, and analyzed accurately. If the questionnaire meets the above standards, then the questionnaire is of high reliability. What needed to be done in the pilot study was to check and improve the comprehensibility of the questionnaire for the subjects, and to verify the consistency of the data collected with the questionnaire at different times.

As mentioned before, the questionnaire is originally the English version of one developed by McKenzie in 1999. In order to reduce ambiguity, the English version of the questionnaire was translated into Chinese by the researcher and double-checked by the researcher’s colleagues, for example, by Mr. Wang, a Ph.D student of English at SUT, before it was administered to the Chinese students.

Then the questionnaire was tested by several randomly selected students. After that, some minor wordings were adjusted on the basis of fidelity to the original text depending on the feedback from the subsequent interview to the respondents. Again, several students were tested with the questionnaire, and the above procedure was repeated until the questionnaire was satisfactory. The end product of the questionnaire and its Chinese version are attached in the Appendix.

The questionnaire is designed to infer the multiple intelligences of the respondents. As we know, multiple intelligences in a person are relatively stable over a short period of time. So the same respondents were tested twice with two questionnaires in an interval of one week. The questionnaires in the two surveys are the same in content but some of the questions were replaced or rearranged. The purpose of such a design is to examine the consistency of the data collected at different times, and meanwhile to minimize the effect on the subjects of what they can remember from the previous questionnaire. Comparing the results of the two questionnaires, the researcher found more than 90% of the answers to the question items were identical, which demonstrates that the questionnaire is of high reliability. Finally, the researcher recorded the time needed for each respondent. The average time span was 11 minutes.

4.5.2 Validity Assessment of the Questionnaire

In general terms, the validity of a questionnaire refers to what the questionnaire measures and how well it does so. According to Campbell (1960), the verifications of

content-related, criterion-related, and construct-related validity are referred to as the most common methods for demonstrating validity.

There is no doubt that the multiple intelligences questionnaire is of content-related validity, in other words, the multiple intelligences questionnaire is related to multiple intelligences. The validity of the questionnaire comes from its associability and speciality, which means the questionnaire is specially designed for collecting data of multiple intelligences. So in the pilot study, only criterion-related validity, and construct-related validity will be assessed.

As suggested by Isaac & Michael (1995), the criterion-related validity of a questionnaire focuses on how well the instrument which compares external variables is considered to be direct measures of the characteristics or behavior being examined. Therefore, a questionnaire has criterion-related validity provided what is elicited from the questionnaire matches the real characteristics being examined. The construct-related validity of a questionnaire, according to the terms of Groth-Marnat (2003), involves the extent to which the results of the questionnaire account for the performances of the subjects, or to put it differently, it is a test of the generalizability of the questionnaire. Thus, a questionnaire would have construct-related validity if the match between the questionnaire outcome and real performance can be generalized, i.e. there are many examples to illustrate that match.

In this study, the researcher surveyed 16 teachers, whose specialities are foreign languages, physical education, musicology, and mathematics respectively, with 4

teachers in each of the 4 specialities. All the teachers were new graduates who had never heard of or knew little about multiple intelligences. After the survey, the questionnaire outcomes were compared with their specialities. The result was that 15 out of 16 or 93.75% outcomes matched the respondents' specialities, i.e. those whose questionnaire scores are the highest in verbal intelligences majored in foreign languages, and the same was true for the match with other majors. The above pilot study shows that with regard to criterion-related and construct-related validity the questionnaire has high validity.

The questionnaire consists of 9 sections, each of which contains 10 items of short statements. Each section corresponds to a particular intelligence. The subjects were required to complete each section by placing a "1" next to each statement that they felt accurately described them, and leaving the statement they did not identify with blank. Then they were asked to total the column in each section. Therefore, surveyed subjects ended with an individual table 4.5.1, and a general table 4.5.2 for the whole, that characterizes their various intelligences. The higher the score is, the stronger the intelligence is.

Table 4.3 Individual Table of Multiple Intelligences

Section	Intelligences	Total Score
1	Naturalist	
2	Musical	
3	Logical	
4	Existential	
5	Interpersonal	
6	Kinesthetic	
7	Verbal	
8	Intrapersonal	
9	Visual	

Table 4.4 General Table of Multiple Intelligences

MI	Naturalist	Musical	Logical	Existential	Interpersonal	Kinesthetic	Verbal	Intrapersonal	Visual	Avg.
Score										
Mean										
%										

4.6 Summary

This chapter discussed the pilot study under four topics. The first topic is about the selection of subjects. In the topic, the originally sampled subjects were asked to perform a writing task, and on the basis of that test, which was subsequently followed by an interview and other tests, the final subjects were selected. The second topic is the design of the writing task, in which the free writing design was modified into a

writing task with specific requirements including theme, time and the number of words allowed according to the feedback from the subjects. The third topic is about error analysis. Based on the writing samples collected from the writing task design, the researcher tried to describe the errors by using a linguistic approach in combination with the surface strategy taxonomy. The fourth topic is the assessment of the questionnaire, where its validity and reliability are appraised from different perspectives.

The next chapter will report the results of the research coupled with the process used to obtain those findings.

CHAPTER 5
ANALYSIS AND FINDINGS

This chapter describes the actual operation of the data collection and data analysis conducted according to the original research design and thereafter to the trial in the pilot study. The data collection and data analysis will answer the four questions and the two hypotheses in Chapter One. In order to answer the three questions and verify the two hypotheses, the corpus for the analysis of grammatical errors will be collected through the writing task from the chosen subjects. The information on multiple intelligences for the research will be acquired from the questionnaire; the data for the investigation of impact of multiple intelligences on the error correction treatment will be obtained through a test.

5.1 Data Collection

Based on the findings from the pilot study, two classes of first year students of English major, in the middle of the term 2009, were arranged to write a composition with a given topic and specific requirements within a definite time. Immediately after the writing, the same students were given the questionnaire on multiple intelligences. One week later, as soon as the grammatical errors in the corpus of the writing were summarized and classified, and the composition of multiple intelligences were

identified and tabulated, the two classes of students received two kinds of instructions respectively. Following the instructions, the error correction tests were administered from which the error correction scores of the students were extracted.

It is worth mentioning that the writing task as an instrument for the elicitation of errors for investigation was imbedded in the mid-term examination for the year 2009 among other examination items. The mid-term exam consisted of three parts: reading comprehension, vocabulary knowledge, and the writing task. The total exam time was 180 minutes, within which 60 minutes were allocated for the writing of a given topic with a specific number of words. The intention of the single blinded maneuvering was to prevent them from knowing that an experiment was being conducted and to avoid the students putting extra efforts into the task, and thus to keep the data unbiased. Again, provided enough time was allowed for the writing of the topic and the limited number of words, the subjects were able to produce authentic and valid data. For the same reason, the error correction test is not an individual test but a component of another examination.

Specifically, apart from the researcher himself and Mr. Wang, the research team was composed of another two English teachers –Vernon and Jenny, who are native speakers of English from Britain and teaching at the same college with the researcher. Each member of the team played an important role during the study. Before the marking of the EFL learners' writing, the team had reached agreement on the classification of the errors. During the marking process, the researcher and Mr. Wang

did the first round, and then Vernon and Jenny double - checked the results, and then discussed any divergences which occurred. The same process was applied to the error correction test. Copies of writing papers with the acronyms of the linguistic errors and the surface errors as well as the error correction papers are attached in the Appendix for reference.

5.2 Data Analyses and Research Findings

If data collection specifies what data to collect and how the data is to be collected, then the data analysis will do the job of presenting the collected data and reporting the findings resulting from interpretation of the data, namely, the data analysis. The findings from the data analyses will be related to the research questions.

5.2.1 Analyses and Findings for Research Question One

Research question one asks what kinds of errors are frequently made by the EFL learners. This research question was answered through the enumeration of grammatical errors in the subjects' compositions against the table of error descriptions. Two classes of students participated in the writing task. Class 1 consisted of 36 students; class 2 consisted of 38 students. Therefore, there were 74 students and 74 separate tables, each of which recorded the errors made by each student. Summing up all the data of the 74 students from class 1 and class 2, and dividing the data by 74, the researcher obtained the following table showing a general description of the errors made.

Table 5.1 Description of Errors of Class One and Class Two

Linguistic Category		Surface Strategy Taxonomy				Sum	Average
Verbs	Auxiliary Verbs	Missing	Superfluous	Incorrect	Misplaced	86	1.16
	Lexical Verbs	Missing	Superfluous	Incorrect	Misplaced	188	2.54
Nouns		Missing	Superfluous	Incorrect	Misplaced	154	2.08
Adjectives		Missing	Superfluous	Incorrect	Misplaced	57	0.77
Adverbs		Missing	Superfluous	Incorrect	Misplaced	39	0.53
Conjunctions		Missing	Superfluous	Incorrect	Misplaced	54	0.73
Articles		Missing	Superfluous	Incorrect	Misplaced	74	1.00
Pronouns		Missing	Superfluous	Incorrect	Misplaced	90	1.22
Prepositions		Missing	Superfluous	Incorrect	Misplaced	95	1.28
Punctuation Symbols		Missing	Superfluous	Incorrect	Misplaced	106	1.43
Total		233	147	539	24	943	12.74
Mean		3.16	1.99	7.28	0.32	12.74	

The above table shows that the total errors are 943 for 74 students, and each of them made an average of 12.74 errors. In the linguistic category, the most frequent errors are lexical verbs errors that occurred 188 times in the compositions of the 74 students, reaching 2.54 times per student, whereas the least made errors are adverb errors, which are 39 in total and 0.53 on average. The second most frequent errors are noun errors occurring 154 times in all and 2.1 times per student, while the second least frequent errors are conjunction errors, the sum of which is 54 times and the mean of which is 0.73. The third most frequent errors occur in punctuation symbols, with a total of 106 times and an average of 1.43 times for each student; the third least frequent errors are adjective errors with a total of 57 and an average of 0.77 times for each student. Under the classification of surface strategy taxonomy, the most frequent errors are incorrect usages, adding up to the sum of 539 times and 7.28 times on

average, compared with the least frequent errors of misplaced usage, which is only 24 times in total and 0.32 on average.

For the purpose of double-checking the findings and making the findings more illustrative, the researcher input the data into the statistical software of SPSS to obtain a frequency and percentage distribution analysis. The following tables and figures are the results of the analysis.

Table 5.2 Frequency and Percentage of Linguistic Errors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1=Auxiliary Verb Errors	86	9.1	9.1	9.1
	2=Lexical Verb Errors	188	19.9	19.9	29.1
	3=Noun Errors	154	16.3	16.3	45.4
	4=Adjective Errors	57	6.0	6.0	51.4
	5=Adverb Errors	39	4.1	4.1	55.6
	6=Conjunction Errors	54	5.7	5.7	61.3
	7=Article Errors	74	7.8	7.8	69.1
	8=Pronoun Errors	90	9.5	9.5	78.7
	9=Preposition Errors	95	10.1	10.1	88.8
	10=Punctuation Symbol Errors	106	11.2	11.2	100.0
	Total	943	100.0	100.0	

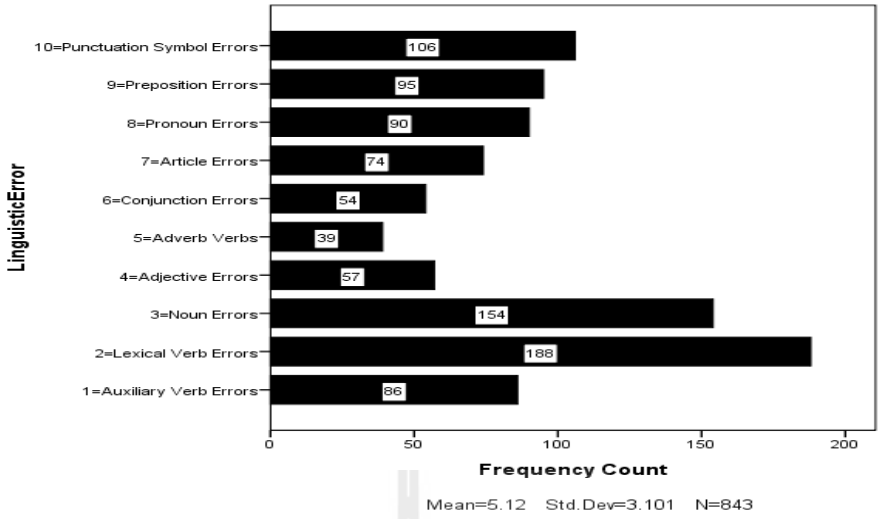


Figure 5.1 Bar Chart of Frequency of Linguistic Errors

Table 5.2 and Figure 5.1 demonstrate again that in the linguistic category the most frequent errors are lexical verb errors that account for 19.9% of the total, while the least frequent errors are adverb errors that account for only 4.1% of the total. The second most frequent errors are noun errors accounting for 16.3% of the total, whereas the second least frequent errors are conjunction errors that are 5.7% of the total. The third most frequent errors are punctuation errors making up 11.2% of the total, whilst the third least errors are adjective errors making up 6% of the total.

Table 5.3 Frequency and Percentage of Surface Errors

Surface Errors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1=Missing	233	24.7	24.7	24.7
	2=Superfluous	147	15.6	15.6	40.3
	3=Incorrect	539	57.2	57.2	97.5
	4=Misplaced	24	2.5	2.5	100.0
	Total	943	100.0	100.0	

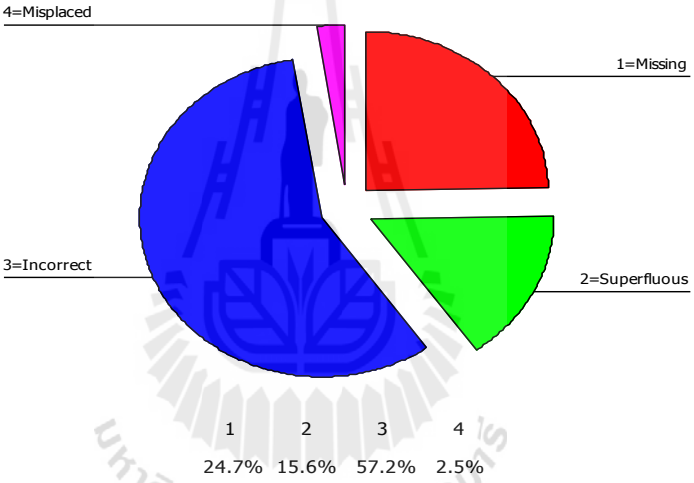


Figure 5.2 Pie Chart of Surface Errors

Table 5.3 and Figure 5.2 confirm that the errors of incorrect usage which account for 57.2% of the total are the most frequent errors under the surface strategy taxonomy, while the errors of misplaced usage account for 2.5% of the total and are the least frequent errors.

In sum, the results come from SPSS analysis match up to the findings listed in Table 5.1. The most frequent errors in the linguistic category occurred in the use of

lexical verbs, nouns and punctuation marks; the most frequent errors under surface strategy taxonomy are incorrect usage errors.

The errors of lexical verbs are concentrated in the incorrect uses of verb tenses, verb voices, non-finite verb forms, subject-verb agreement, and using nouns in place of verbs. Some sentences containing lexical verb errors extracted from the compositions are as follows.

1) When we were children, we **don't*** know many things.

(A tense error made by Lai Fangfang)

2)…and your knowledge is **enrich***.

(A voice error made by Lin Yuanling)

3) **Learn*** with a teacher, we can never feel lonely.

(A non-finite error made by Han Jiaqi)

4) Learning by ourselves **mean*** we will….

(A subject-verb agreement error made by Peng Shaoting)

5) If we want to **success***, we must study hard by ourselves.

(An error of using a noun for a verb made by Xu Siming)

The noun errors mostly appear in wrong usages of single and plural nouns, and using verbs and adjectives in the place of nouns, etc. Some examples taken from the compositions are as follows.

1) Maybe they are good at how to arrange their **times***.

(A plural noun error made by Li Yanghua)

2) I have three **reason*** to stand my opinion.

(*A single noun error made by Li Chunrong*)

3) I think **learn*** with a teacher is better than by myself.

(*An error of using a verb for a noun made by Li Huaxiu*)

4) We can learn by ourselves in this small **social＊**.

(*An error of using an adverb for a noun made by Hao Jing*)

Punctuation symbols actually play an important grammatical function that indicates the structure and organization of the written language. The most frequent punctuation symbol errors are the incorrect uses of commas and periods that may result in run-on sentences and fragmented sentences that are exemplified in the following:

1) We often need learning**,＊** learning make a progress.

(*A comma error made by Chen Mengyuan*)

2) If we want to get more knowledge**.** **＊** We must learn by ourselves.

(*A period error made by Hao Jing*)

3) The most important way of learning something is learning by ourselves, but we can't leave the help of teachers**.＊** Especially in the university.

(*A period error made by Ke Dixiao*)

5.2.2 Analyses and Findings for Research Question Two

Research question two investigated the characteristics of multiple intelligences of the EFL learners, which is descriptive in nature. The multiple intelligences conditions for each student were collected with the questionnaire. Similar to the counting of errors, there were 74 tables of multiple intelligences recorded for 74 students, and a name list noting the students' intelligences scores that is attached in the appendix.

As mentioned in chapter 3, the internal reliability of the questionnaire can be measured by Cronbach's alpha. Thus inputting the data into the statistical program SPSS for the coefficient calculation yielded the following results.

Table 5.4 Questionnaire Reliability of Cronbach's Alpha

Case Processing Summary

		N	%
Cases	Valid	74	100.0
	Excluded[a]	0	.0
	Total	74	100.0

a. A list of all the deletions based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.882	9

The alpha coefficient for the nine items is 0.882, suggesting that the nine intelligences have a relatively high internal consistency, for the coefficient 0.882 is far greater than 0.7. In most social science research situations, a reliability coefficient of .70 or higher is considered acceptable.

Summarizing all the data in the separate tables recording the multiple intelligences of each student, the researcher obtains the following table and figure.

Table 5.5 Frequency and Percentage of Multiple Intelligences

MI	Naturalist	Musical	Logical	Existential	Interpersonal	Kinesthetic	Verbal	Intrapersonal	Visual	Avg.
Score	390	368	374	445	351	396	360	500	364	349.22
Mean	5.27	4.97	5.05	6.01	4.74	5.35	4.86	6.76	4.92	5.33
%	10.99%	10.37%	10.54%	12.54%	9.89%	11.16%	10.15%	14.09%	10.26%	11.11%

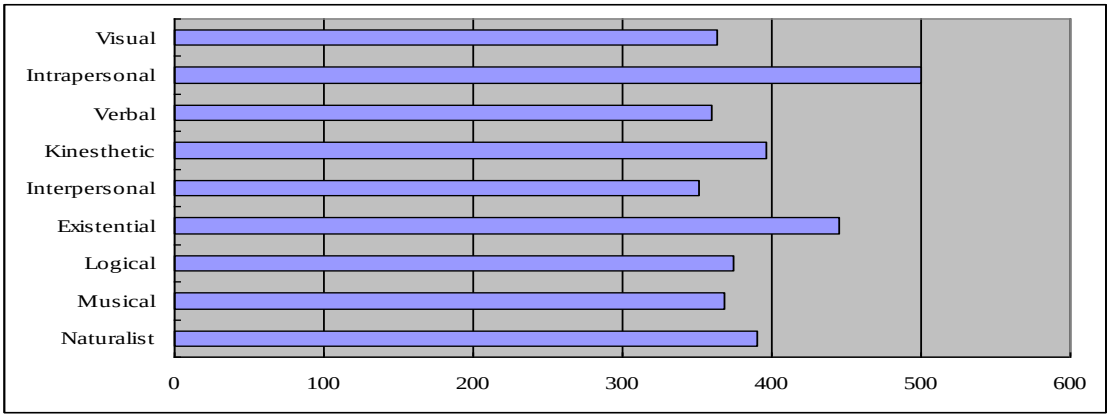


Figure 5.3 Bar Chart of Frequency of Multiple Intelligences

The above table and figure clearly show that on the whole the intrapersonal intelligence is the strongest, while the interpersonal intelligence is the weakest, though the distinction between the interpersonal intelligence and the other intelligences including visual and verbal intelligences is far from obvious. Apart from that, among the nine intelligences, another relatively strong intelligence is the existential intelligence; in contrast, another relatively weak intelligence is verbal intelligence.

According to Larson-Hall (2010: 257), "…the one-sample t-test is used when you have measured only one mean score, but you would like to compare this mean to some idealized mean or otherwise already known mean score...." Taking the average mean of the nine intelligences as the test value to conduct a double check with the one-sample t-test, the researcher obtained the output of following tables from SPSS.

Ta**ble 5.6 One-Sample T-test of Multiple Intelligences**

	N	Mean	Std. Deviation	Std. Error Mean
Naturalist	74	5.27	1.730	.201
Musical	74	4.97	1.937	.225
Logical	74	5.05	2.033	.236
Existential	74	6.01	1.891	.220
Interpersonal	74	4.74	1.952	.227
Kinesthetic	74	5.35	2.180	.253
Verbal	74	4.86	1.911	.222
Intrapersonal	74	6.76	2.026	.236
Visual	74	4.92	2.238	.260

	Test Value = 5.33					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Naturalist	-.297	73	.767	-.060	-.46	.34
Musical	-1.585	73	.117	-.357	-.81	.09
Logical	-1.167	73	.247	-.276	-.75	.20
Existential	3.110	73	.003	.684	.25	1.12
Interpersonal	-2.586	73	.012	-.587	-1.04	-.13
Kinesthetic	.084	73	.933	.021	-.48	.53
Verbal	-2.094	73	.040	-.465	-.91	-.02
Intrapersonal	6.058	73	.000	1.427	.96	1.90
Visual	-1.580	73	.118	-.411	-.93	.11

The one-sample t-test statistical table reveals that visual intelligence has the highest standard deviation of 2.238, and naturalist intelligence has the smallest standard deviation of 1.730. This means the students among the group are most varied in visual intelligence, while they are least varied in naturalist intelligence.

The one-sample test table shows more. The t-value informs us of the difference between the mean score of the nine intelligences and each of the intelligences, as well as the different directions. The significance value shows us whether or not the difference is significant. In the table, the intrapersonal intelligence has the greatest t-value +6.058 that means the intrapersonal intelligence is the strongest intelligence found among the students, and its sig.-value is 0.000, which is smaller than 0.05, implying that with more than 95% confidence the judgment on the intrapersonal intelligence is true. For the same reason, the interpersonal intelligence that has a t-value -2.586 and a sig.-value 0.012 is the weakest intelligence. The second strongest and the second weakest intelligences are existential intelligence with a t-value +3.110 and a sig.-value 0.003, and verbal intelligence with a t-value -2.094 and a sig.-value 0.040 respectively.

In short, the characteristics of multiple intelligences of the EFL learners are that, on the one hand, they are most varied in visual ability and most uniform in naturalist intelligence; on the other hand, they are particularly strong in intrapersonal intelligence and relatively strong in existential intelligence, but especially weak in interpersonal intelligence and relatively weak in verbal intelligence.

5.2.3 Analyses and Findings for Research Question Three

Research question three relates to the relationship between the EFL learners' multiple intelligences and the frequency of errors they make. The answer to the question lies in the test and verification of the hypothesis. The hypothesis that there is no relationship between the EFL learners' multiple intelligences and the frequencies of types of errors has two variables. One variable is the frequencies of the types of errors; the other is the multiple intelligences. The frequencies of the types of errors are disclosed in the findings for research question one, and the conditions of the multiple intelligences are ascertained in the findings for research question two. Since there are two kinds of errors in the counting, the analysis will be carried out in two steps. In the first step, the task is to analyze the relationship between linguistic errors and multiple intelligences. In the second step, the task is to analyze the relationship between surface errors and multiple intelligences. Feeding the data of linguistic errors and multiple intelligences into SPSS, then left clicking the analyze button, choosing correlate button from the dropdown menu, and next choosing bivariate button from the popup menu to do the correlation analysis, lastly the researcher gains summary tables of correlation between multiple intelligences and linguistic errors, and correlation between multiple intelligences and surface errors. The two summary tables, from which the valid pairs of correlations were selected, are attached in the appendix.

From the summary table of the correlation between multiple intelligences and linguistic errors, the researcher extracted only the cells where the sig.-values are

smaller than 0.05 from the correlation table, coupled with the correlational line charts that were produced by SPSS below. Other kinds of hypothesized relationship between multiple intelligences and linguistic errors are rejected, considering that their sig.-values are greater than 0.05.

Table 5.7 Correlation between naturalist intelligence and article errors

		Article
Naturalist	Pearson Correlation	-.327*
	Sig. (2-tailed)	.039
	N	40

Table 5.7 showed the Pearson correlational coefficient between the naturalist intelligence and article errors was -.327 and that 40 students made such errors.

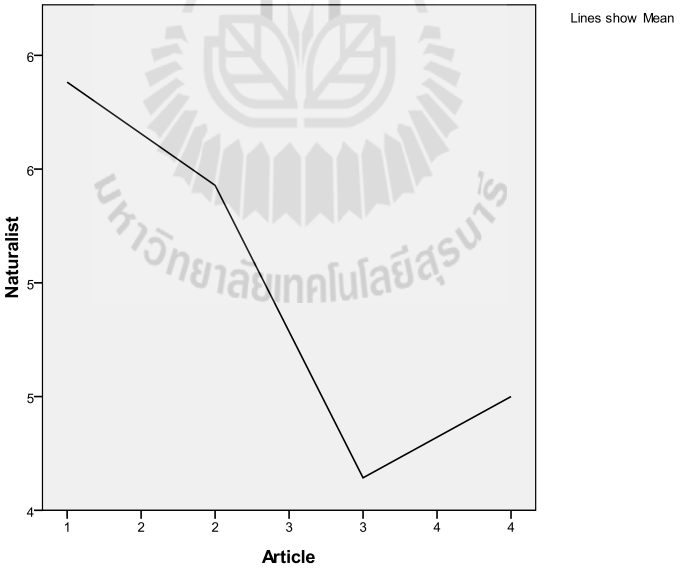


Figure 5.4 Correlation between naturalist intelligence and article errors

Figure 5.4 illustrates the correlation existed between naturalist intelligence and article errors. Roughly, the stronger the naturalist intelligence of the subjects is, the less article errors arise.

Table 5.8 Correlation between musical intelligence and article errors

		Article
Musical	Pearson Correlation	-.366*
	Sig. (2-tailed)	.020
	N	40

Table 5.8 showed the Pearson correlational coefficient between musical intelligence and article errors was -.366 and that 40 students made such errors.

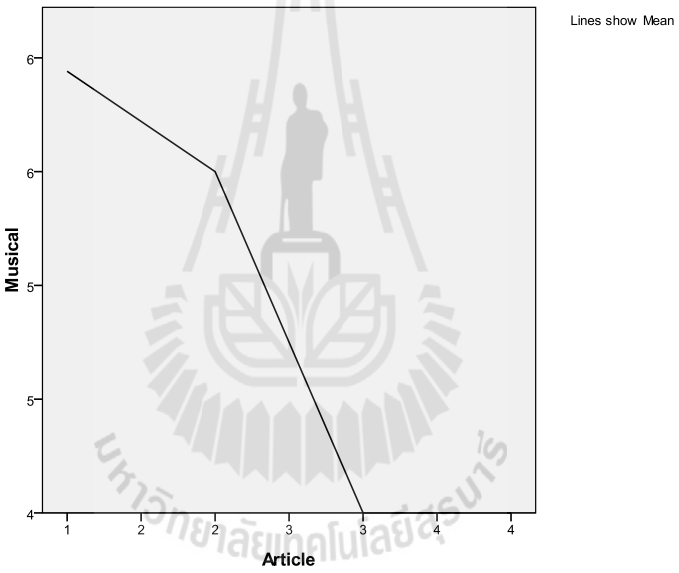


Figure 5.5 Correlation between musical intelligence and article errors

Figure 5.5 interprets the relationship between the musical intelligence and article errors. Approximately, the stronger the musical intelligence of the subject is, the less article errors are made.

Table 5.9 Correlation between visual intelligence and article errors

		Article
Visual	Pearson Correlation	-.413**
	Sig. (2-tailed)	.008
	N	40

Table 5.9 showed the Pearson correlational coefficient between the visual intelligence and article errors was -.413 and that 40 students made such errors.

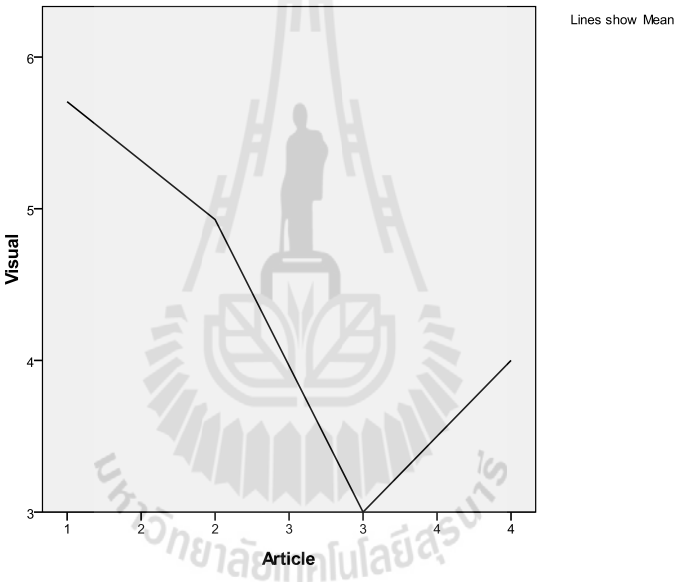


Figure 5.6 Correlation between visual intelligence and article errors

Figure 5.6 displays the relationship between visual intelligence and article errors, according to which, there is a tendency whereby the stronger the visual intelligence of the subjects is, the less article errors occur.

Table 5.10 Correlation between logical intelligence and article errors

		Article
Logical	Pearson Correlation	-.400*
	Sig. (2-tailed)	.011
	N	40

Table 5.10 showed the Pearson correlational coefficient between logical intelligence and article errors was -.400 and that 40 students made such errors.

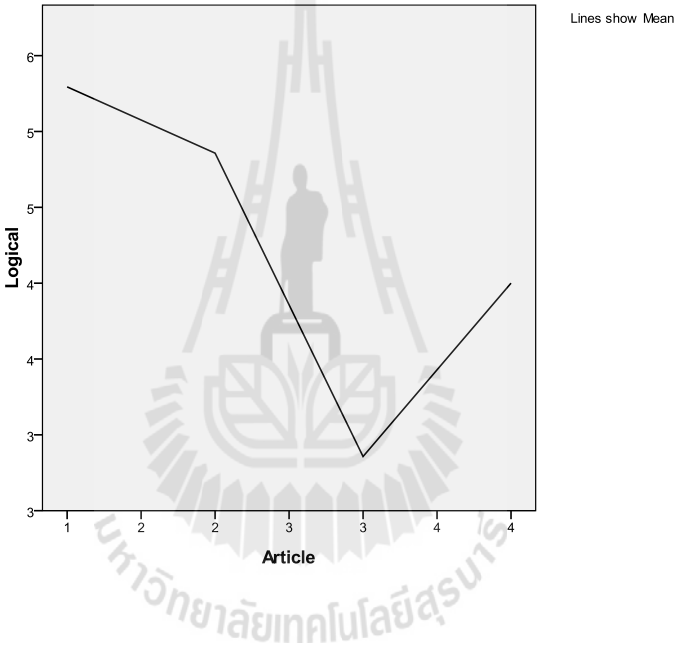


Figure 5.7 Correlation between logical intelligence and article errors

Figure of 5.7 shows that logical intelligence roughly correlates with article errors. The stronger the logical intelligence of the subjects is, the less article errors occur.

Table 5.11 Correlation between kinesthetic intelligence and article errors

		Article
Kinesthetic	Pearson Correlation	-.379*
	Sig. (2-tailed)	.016
	N	40

Table 5.11 showed the Pearson correlational coefficient between kinesthetic intelligence and article errors was -.378 and that 40 students made such errors.

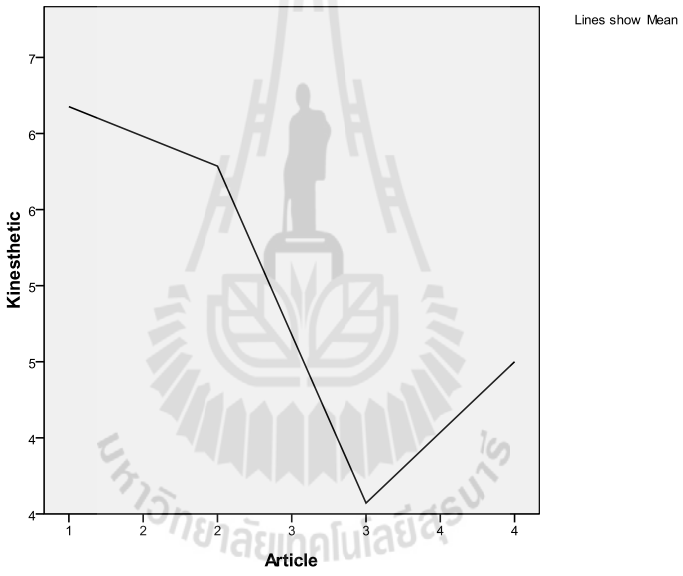


Figure 5.8 Correlation between kinesthetic intelligence and article errors

Figure 5.8 exhibits a similar proclivity as the above figures, which can be explained as the stronger the kinesthetic intelligence of the subjects is, the less article errors emerge.

Table 5.12 Correlation between existential intelligence and article errors

		Article
Existential	Pearson Correlation	-.358*
	Sig. (2-tailed)	.023
	N	40

Table 5.12 showed the Pearson correlational coefficient between the existential intelligence and article errors was -.358 and that 40 students made such errors.

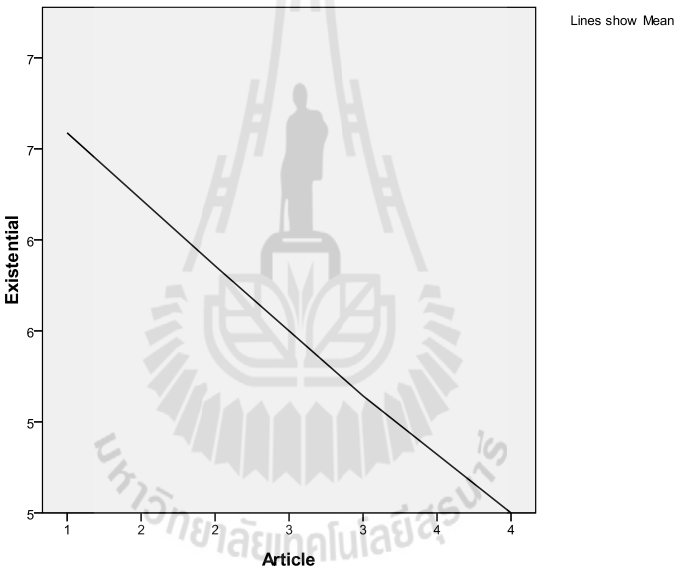


Figure 5.9 Correlation between existential intelligence and article errors

Figure 5.9 almost perfectly describes the linear relationship between existential intelligence and article errors. Thus, it is nearly certain that the stronger the existential intelligence of the subjects is, the less article errors occur.

Table 5.13 Correlation between verbal intelligence and article errors

		Article
Verbal	Pearson Correlation	-.364*
	Sig. (2-tailed)	.021
	N	40

Table 5.13 showed the Pearson correlational coefficient between verbal intelligence and article errors was -.364 and that 40 students made such errors.

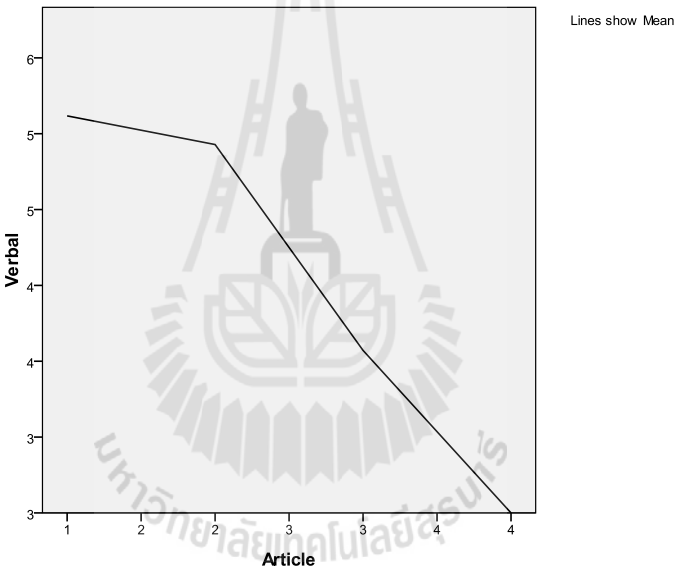


Figure 5.10 Correlation between verbal intelligence and article errors

Figure 5.10 demonstrates a relatively close relationship between the two variables –verbal intelligence and article errors. The stronger the verbal intelligence of the subjects is, the less article errors occur.

Table 5.14 Correlation between kinesthetic intelligence and punctuation errors

		Punctuation
Kinesthetic	Pearson Correlation	.290*
	Sig. (2-tailed)	.041
	N	50

Table 5.14 showed the Pearson correlational coefficient between kinesthetic intelligence and punctuation errors was -.290 and that 50 students made such errors.

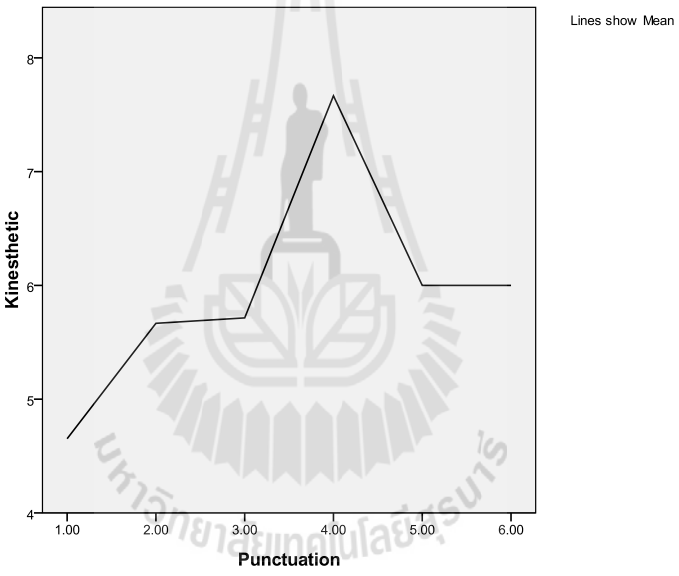


Figure 5.11 Correlation between kinesthetic intelligence and punctuation errors

Figure 5.11 is different from all the above in that for the first time a positive significant correlation is found between two variables in the study. Despite the fact that the charted line is much inflected, there is a general trend showing that the stronger the kinesthetic intelligence of the subjects is, the more punctuation errors

appear. It is a very interesting phenomenon because it completely confirms our common sense view that a person who is more active in body movement tends to ignore some details such as punctuation symbols.

Table 5.15 Correlation between existential intelligence and preposition errors

		Preposition
Existential	Pearson Correlation	-.283*
	Sig. (2-tailed)	.044
	N	51

Table 5.15 showed the Pearson correlational coefficient between existential intelligence and preposition errors was -.283 and that 51 students made such errors.

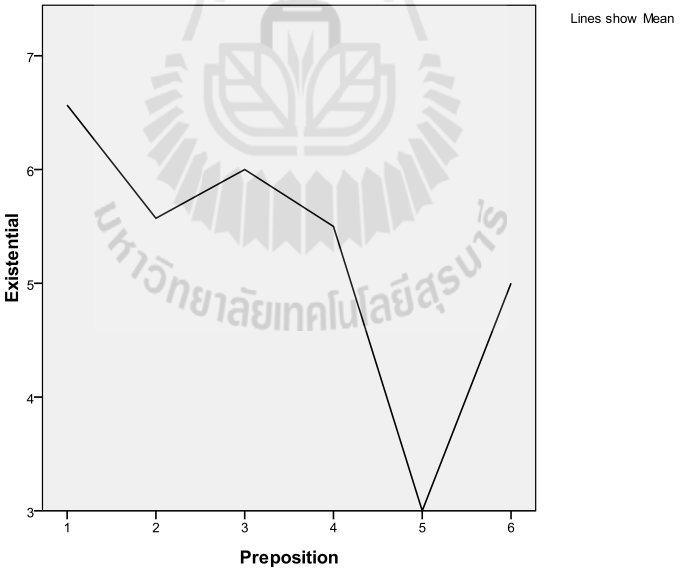


Figure 5.12 Correlation between existential intelligence and preposition errors

Figure 5.12 portrays the relationship between existential intelligence and preposition errors, although it is more irregular, it would seem to predict that the stronger the existential intelligence of the subjects is, the less preposition errors occur.

The kinds of correlation as shown in the above tables and figures can be either classified into the obvious and the less obvious, or the negative and the positive. The obvious correlations are found between article errors and logical and visual intelligences, both the absolute correlational values of which are larger than 0.4, which means the stronger the logical and visual intelligences are, the fewer article errors there are. In comparison, existential intelligence has a less obvious correlation with preposition errors because of the meager absolute correlation value of 0.283. That is to say, the lower the existential intelligence is, the fewer preposition errors there are. However, kinesthetic intelligence has a positive correlation with punctuation errors, which means the stronger the kinesthetic intelligence is, the more punctuation errors are made, all the other statistically significant correlations found between multiple intelligences and linguistic errors are negative.

Examining the summary table of correlation between multiple intelligences and surface errors, the researcher found, within the table of correlations between multiple intelligences and surface errors, there is only one pair of correlations which is significant – the kinesthetic intelligence and missing errors. The remaining hypothesized relationships are rejected because their sig.-values are larger than 0.05.

Table 5.16 Correlation between kinesthetic intelligence and missing errors

		Missing
Kinesthetic	Pearson Correlation	.309*
	Sig. (2-tailed)	.013
	N	64

Table 5.16 showed the Pearson correlational coefficient between kinesthetic intelligence and word missing errors was -.283 and that there were 64 students who made such errors.

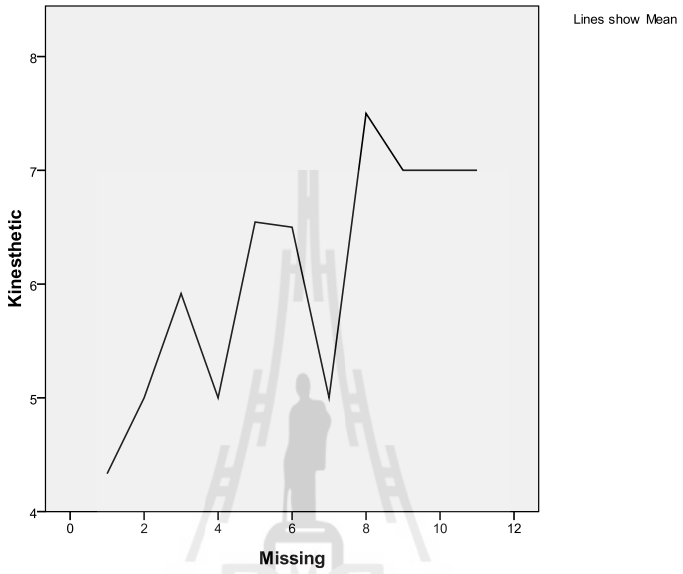


Figure 5.13 Correlation between kinesthetic intelligence and missing errors

Figure 5.13 reflects the only positive correlation of statistical significance found among all the relationships between multiple intelligences and surface errors. Jagged as the line is, there is a trend showing that the stronger the kinesthetic intelligence of the subjects is, the more likely missing errors will occur. Similar to the relationship between kinesthetic intelligence and punctuation errors, it can be understood as a result that a person who is more active in body movement tends to be more careless.

In short, there are ten pairs of correlations with regard to the errors, nine of which are found between linguistic errors and multiple intelligences, and one of which is found between surface strategy taxonomy errors and multiple intelligences.

All multiple intelligences except interpersonal and intrapersonal intelligences are found to have some relationship with some type of linguistic error, but there are only three types of linguistic errors, which are article errors, preposition errors and punctuation errors, that show a correlation with specific intelligences. In addition, there is one type of surface strategy taxonomy error, which is missing usage errors alone, which correlates with kinesthetic intelligence. Finally, yet most importantly, all but the relationship between punctuation errors and kinesthetic intelligence, as well as the missing errors and the kinesthetic intelligence, are negative. Up to now, hypothesis one that there is no relationship between the EFL learners' multiple intelligences and the frequencies of types of errors can be partly rejected.

5.2.4 Analyses and Findings for Research Question Four

Research question four aims to investigate if there is any difference in the error-correction between the two groups of EFL learners after two kinds of instruction were delivered. To answer this question, a quasi-experimental design of two-group pretest-posttest should be applied. As suggested by Trochim (2001), the sole difference between an experimental design and a quasi-experimental design lies in randomization. To be specific, the quasi-experimental design resembles an experimental design, except for the omission of subjects being randomly selected, and it also has three stages. First, the members of the two groups' should be observed to determine whether they are roughly equivalent in the number of errors they make. Second, the two groups should be administered two different interventions that are

different instructions in this study. Third, the members of the two groups should be observed again to discover if there is any disparity in the quantity of error correction as expected. The following diagram is an illustration of the experimental design. Here, X stands for intervention, O stands for observation.

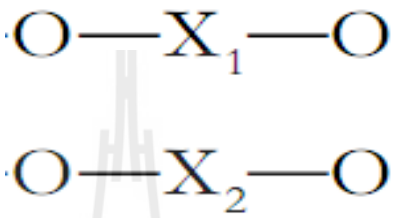


Figure 5.14 Quasi-Experimental Design

In the first stage, the difference in the amount of errors made between the two classes should be identified. Using SPSS, the error data is entered into the program, and then an independent-samples t test is run, thus giving the researcher the two sets of results shown in the following tables. One set of results reports the significance values of the average differences between class one and class two in their linguistic errors; the other set of results describes the significance values of the average differences in the surface strategy taxonomy errors of the two classes.

Table 5.17 Independent-Samples T Test of Linguistic Errors

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AV	Equal variances assumed	.301	.587	-.716	39	.479	-.288	.403	-1.102	.526
	Equal variances not assumed			-.719	38.074	.476	-.288	.401	-1.099	.523
LV	Equal variances assumed	.017	.897	.376	59	.709	.179	.476	-.773	1.130
	Equal variances not assumed			.374	56.214	.710	.179	.478	-.778	1.136
Noun	Equal variances assumed	.708	.403	1.113	61	.270	.522	.469	-.416	1.460
	Equal variances not assumed			1.110	58.509	.271	.522	.470	-.419	1.463
Adj	Equal variances assumed	1.492	.231	1.207	30	.237	.467	.387	-.323	1.256
	Equal variances not assumed			1.248	25.732	.223	.467	.374	-.302	1.236
Adv	Equal variances assumed	.843	.368	.245	22	.809	.111	.454	-.831	1.054
	Equal variances not assumed			.295	20.139	.771	.111	.377	-.675	.897
Conj	Equal variances assumed	.010	.920	.445	29	.660	.179	.404	-.646	1.005
	Equal variances not assumed			.441	25.162	.663	.179	.407	-.659	1.018
Art	Equal variances assumed	.110	.741	1.282	38	.208	.363	.283	-.210	.937
	Equal variances not assumed			1.277	34.102	.210	.363	.284	-.215	.941
Pron	Equal variances assumed	1.368	.249	.524	41	.603	.284	.541	-.808	1.375
	Equal variances not assumed			.521	36.780	.606	.284	.544	-.820	1.387
Prep	Equal variances assumed	7.481	.009	-1.194	49	.238	-.417	.349	-1.118	.285
	Equal variances not assumed			-1.161	36.796	.253	-.417	.359	-1.144	.311
P.S	Equal variances assumed	.034	.854	.253	48	.802	.100	.395	-.695	.895
	Equal variances not assumed			.252	46.542	.802	.100	.396	-.696	.896

The above table indicates, along the row of equal variances not assumed under the column of sig. value of Levene's test in the SPSS output table 5.2.4.1, none of the sig.-values in it is 0.05 or less. So statistically speaking, the differences among all types of linguistic errors made by the two groups of learners are not significant at 0.05 level. Likewise, no significant differences were found in surface strategy taxonomy errors between the two groups as shown in table 5.2.4.2. So the assumptions of the existence of any significant difference of linguistics errors as well as surface errors between the two groups was rejected. In other words, the grammatical level of the two groups was observed to be the same as before any intervention.

Table 5.18 Independent-Samples T Test of Surface Errors

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Missing	Equal variances assumed	.008	.930	-.651	62	.518	-.367	.563	-1.493	.760
	Equal variances not assumed			-.650	61.408	.518	-.367	.564	-1.494	.761
Superfluous	Equal variances assumed	.579	.451	1.145	49	.258	.694	.607	-.525	1.914
	Equal variances not assumed			1.125	42.280	.267	.694	.617	-.551	1.940
Incorrect	Equal variances assumed	.002	.964	.232	72	.818	.259	1.117	-1.969	2.486
	Equal variances not assumed			.231	70.573	.818	.259	1.120	-1.975	2.492
Misplaced	Equal variances assumed	2.887	.115	1.565	12	.144	1.000	.639	-.392	2.392
	Equal variances not assumed			2.535	9.000	.032	1.000	.394	.108	1.892

In the second stage of the quasi-experimental design, the two classes received different instructions from the researcher. Class two, which was the control group

received traditional teacher-centered instruction. In class two, all the grammatical errors found in the compositions were listed, analyzed and explained one by one, coupled with related grammatical knowledge introduction and followed by class discussion and exercises. Class one was treated as the experimental group since the pedagogy employed in the class was based on the multiple intelligences theory and the learner centered idea. In class one, all the instruction process is the same as in class two except for the requirement that an error made by a particular student had to be corrected and exemplified by him/her in a way that was suitable to his/her strength in some aspect of the multiple intelligences. The most significant difference does not lie in the preface of instruction of grammar knowledge for the two classes, but in the instructional design that the particular student who made the errors has to correct them. For example, if a student shows strength in musical intelligence, he/she would be asked to create, either on his/her own or mimicking a model prepared by the researcher, a rhythmic or rhymed verse containing the grammar knowledge that he/she had explicated in order to reinforce the newly acquired knowledge. In short, the undifferentiated error corrections in the control group were treated explicitly, while the MI based error corrections in the experimental group were treated both explicitly and implicitly.

In the third stage, the two classes of students were given a test of error correction. The error correction test comprised 50 sentences all of which were extracted and adapted from the EFL learners' writing, and each of which contained at least one error

that had been instructed differently in both the control group and the experimental group prior to the test. When the test was over, the counting of the errors begins. For the convenience of later analysis, each valid correction scores 0.5 points. A student's score of error correction was decided by the number of successfully corrected errors. The error test samples are attached in the appendix for reference. The following table shows the numbers of the student, the total and average scores earned by the two classes as well as their differences.

Table 5.19 Error Correction Score

	Class One	Class Two	Difference Value of Class One minus Class Two
Student Number	36	38	-2
Total Score	1040	992	48
Mean Score	28.89	26.11	2.78

The above table shows class one that was experimented with multiple intelligences based instruction obtained higher scores both in the total and on the average than the scores of class two that were treated as a control group in the study. Considering that prior to the intervention, the two classes scored equally in the numbers of their errors, the differences in the test must be the result of different instructional strategies.

If we are still not sure whether the difference is the result of coincidence, then the independent-samples t test would exclude such a possibility to a great extent. Using SPSS to carry out the independent samples test on the students' scores, the

researcher obtained statistically significant differences between the two classes in the error correction test as shown in the following table.

Table 5.20 Independent-Samples T Test of Error Correction

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	4.154	.045	1.969	72	.053	2.784	1.413	-.034	5.601
	Equal variances not assumed			1.990	65.283	.051	2.784	1.399	-.010	5.578

Checking the sig.-value along the row of equal variances not assumed under the column of sig. value of Levene's test in the SPSS output table 5.5.4.4, the researcher found it is 0.045 which is lower than 0.05, so we cannot assume equal variances. Therefore, we can say that with 95% confidence that the error correction difference between the MI based instruction and the undifferentiated instruction was not due to coincidence. The difference is statistically significant, in other words, the multiple intelligences based instruction did make a difference in the students' performance of error-correction. Therefore, hypothesis two that the multiple intelligences based

instruction does not make a difference in the students' performance of error-correction is rejected with 95% confidence.

In brief, the quasi-experiment is successful, for it demonstrates that the multiple intelligences based instruction is more effective than traditional instruction in the treatment of grammatical errors of EFL learners.

5.3 Summary

The findings from the data analyses in the chapter answered four questions and verified both the hypotheses. The findings were obtained objectively and supported by hard evidence. Nevertheless, objectivity alone does not necessarily signify perfection. The next chapter will draw the conclusions, examine the implications, explore the limitations and discuss recommendations for future study.

CHAPTER 6
CONCLUSION AND DISCUSSION

This chapter begins with the findings of the previous chapters, and then discusses the implications of the findings for the language teaching and learning, and finally suggests further studies on account of limitations of this study with regard to both the research design and the methodology.

6.1 Conclusion

The entire research aimed to answer four questions and test two hypotheses which were related to the questions. . The answers to the questions and the hypotheses constructed our holistic understanding about the relationship between grammatical errors and multiple intelligences. In the pursuit of the answers, some of the findings were what the researcher expected, but some were serendipities which the researcher had not anticipated.

For research question one, the study reveals what the most frequently made grammatical errors by the EFL learners are. The most frequently made grammatical errors were firstly lexical verb errors, secondly noun errors, and thirdly punctuation errors according to the linguistic classification, and firstly the incorrect usage errors in surface strategy taxonomy. On the other hand, the research revealed what the least

frequently made errors are, which are firstly adverb, secondly conjunction, and thirdly adjective verbs errors in the linguistic classification, and firstly the misplaced usage errors in surface strategy taxonomy.

In short, the research findings for question one answered not only what the most frequent errors, are but also what the least frequent are. The following tables list the ranking of the types of errors with regard to their frequencies and percentages from the highest to the lowest.

Table 6.1 Ranking of Linguistic Errors

Ranking	Linguistic	Frequency	Percentage
1	Lexical Verb Errors	188 times	19.9%
2	Noun Errors	154 times	16.3%
3	Punctuation Errors	106 times	11.2%
4	Preposition Errors	95 times	10.1%
5	Pronoun Errors	90 times	9.5%
6	Auxiliary Verb Errors	86 times	9.1%
7	Article Errors	74 times	7.8%
8	Adjective Errors	57 times	6.0%
9	Conjunction Errors	54 times	5.7%
10	Adverb Errors	39 times	4.1%

Table 6.2 Ranking of Surface Error

Ranking	Surface	Frequency	Percentage
1	Incorrect Errors	539 times	57.2%
2	Missing Errors	233 time	24.7%
3	Superfluous Errors	147 times	15.6%
4	Misplaced Errors	24 times	2.5%

The findings of research question two showed that the multiple intelligences were relatively uniform compared with a great variety of types of errors. Moreover, according to Mckenzie (2005), the nine intelligences are grouped into three domains: the interactive, analytic, and introspective. The intrapersonal, existential and visual intelligences belong to the introspective domain, and the verbal, interpersonal and kinesthetic intelligences are categorized as the interactive domain. The fact that these learners who displayed strength in their intrapersonal and existential intelligences, but weakness in their interpersonal and verbal intelligences reveals that they are more introspective than interactive in their multiple intelligences.

The findings of research question three rejected the hypothesis that there is no relationship between the EFL learners' multiple intelligences and the types of errors, although there only a few pairs of correlation could be confirmed, as summarized in the following table. Table 6.1.3 lists the correlations between article errors and the seven intelligences with the highest correlation at the top and the lowest correlation at the bottom according to their Pearson correlation values.

Table 6.3 Article Errors Correlations with Multiple Intelligences

Multiple Intelligences		Article
Visual	Pearson Correlation	-.413**
	Sig. (2-tailed)	.008
Logic	Pearson Correlation	-.400*
	Sig. (2-tailed)	.011
Kinesthetic	Pearson Correlation	-.379*
	Sig. (2-tailed)	.016
Musical	Pearson Correlation	-.366*
	Sig. (2-tailed)	.020
Verbal	Pearson Correlation	-.364*
	Sig. (2-tailed)	.021
Existential	Pearson Correlation	-.358*
	Sig. (2-tailed)	.023
Naturalist	Pearson Correlation	-.327*
	Sig. (2-tailed)	.039

The other correlations were found between kinesthetic intelligence and punctuation errors, the correlation value of which is 0.29 with sig.-value 0.041, and between existential intelligence and preposition errors with the correlation value 0.283 and sig.-value 0.044.

It is interesting that the interpersonal and intrapersonal intelligences play no significant role in any linguistic errors. At the same time, referring to Table 6.1, the researcher noted the percentage sum of three kinds of linguistic errors, namely, article errors 7.8%, punctuation errors 11.2% and preposition errors 10.1% account for only 29.1% of the total. In other words, only about 1/3 of the linguistic errors are partially related to any of the multiple intelligences.

As far as the surface strategy taxonomy errors are concerned, only one correlation is confirmed, which is the correlation between kinesthetic intelligence and missing usage errors. According to Table 6.2, the missing usage errors account for

24.7% of the total. That means about 1/4 of the errors are partly connected to one single intelligence. The above results may seem a little discouraging, but that is often the nature of research in social science.

The answers to first three questions are in effect a preparation for verifying hypothesis two and answering question four. The findings from question one granted the researcher a reference point to determine the contents of the error correct test. The findings from question two helped the researcher to be familiar with the learners' intelligence conditions individually and collectively, so that the researcher could design targeted instructions for each student and the whole class. The findings from question three have a predictive value for the possible findings of question four, for if a correlation does exist, then probably the multiple intelligences based instruction should be effective to some extent.

As expected, the results of the experiment rejected hypothesis two that the multiple intelligences based instruction did not make a difference to the students' performance of error-correction. The multiple intelligences based instruction did improve the students' performance of error-correction as shown in table 5.2.4.3 in Chapter 5 as can be seen by a simple comparison of the total and mean score of the two classes in their error correction test. Moreover, the degree of the improvement overall is significant according to the results of the independent samples t test of the two groups' error correction scores as shown in Table 5.2.4.4. in Chapter 5.

6.2 Discussion

The findings of the study have multiple implications for language researchers, teachers, and learners.

For language researchers, the finding for research question one confirmed Murrow's investigation of Japanese EFL learners in 2005 which showed that the incorrect usage of lexical verbs accounts for most of the errors in their writings. The finding for research question two that the strongest intelligence displayed was intrapersonal intelligence is quite credible. The prevalence of intrapersonal intelligence among the Chinese EFL learners can be attributed to cultural influence. In Confucianist dominated Asian countries like China, introverted personality and self-examination behavior are encouraged. For instance, Chinese people are inculcated from birth with such famous sayings of Confucius as "A gentleman finds faults with himself while a base man finds faults with others", "Think twice before acting". Furthermore, in contrast with the strongest intrapersonal intelligence, the interpersonal was found to be the weakest logically. The finding for research question three that the clearest correlation was a negative one between the visual intelligence and article errors, is supplemental to the study by Mahdavy (2008), who finds linguistic intelligence contributes to listening proficiency. The finding for question four that the MI based instruction improved the EFL learners' performance of error-correction significantly substantiated the claim by Loredana and Aneliz (2011) that the application of multiple intelligences instruction is beneficial in EFL education.

For language teachers and language learners, the findings that show the distribution of grammatical errors of EFL learners can be used as a learning guide to help the language teachers to organize learning materials and language learners to pay particular attention to their language deficiencies. Thus, the teachers teach more purposefully and the learners learn more efficiently. The findings that characterize the intelligences composition of the learners enabled the learners to understand themselves and enhanced their self-confidence. The findings that revealed the relationship between multiple intelligences and grammatical errors contributed to the improvement of a teaching strategy to achieve better results. The findings that validated the evident effect in the treatment of grammatical errors offer an alternative and innovative method of language education.

Although the study confirmed the value of MI theory in EFL teaching and learning, and made some enlightening findings that may inspire the reformation of traditional pedagogy in the field of EFL education, it has some limitations with regard to both its micro aspect and its macro aspects.

Firstly, with respect to the micro aspect, the subjects that participated in the study were not randomly selected, and thus it reduced the inquiry of research question four to a quasi-experimental process; secondly, because the number of subjects was not large enough, the statistical findings obtained from the limited number of subjects are not sufficiently generalizable with complete confidence; thirdly, the tally of errors may not be completely accurately because some errors were difficult to define, although expert reviews and peer reviews were administered.

As for the macro aspect, the quantitative method and quasi-experimental design running through the study expressed the positive attitude of the researcher to the social sciences. Positivism as described by Cohen et al. (2005: 8) is, "…historically associated with the nineteenth-century French philosopher, Auguste Comte, who was the first thinker to use the word for a philosophical position." Since the application of positivism to the social sciences, the debate and criticism around it have been incessant. The denunciation mainly focuses on its effect of dehumanization of individuals caused by the employment of rules and regularities of the natural sciences into the social sciences, treating a subjective individual as an objective object with passive behaviorism, measuring immeasurable experience on physical scales, reducing a rich life into a simplistically rule-governed world.

The above limitations require further studies to rectify the flaws, verify the findings and advance the frontiers of the applications of the theory of multiple intelligences in education. More specifically, in order to rectify the flaws, on the micro level, a large and randomized sample coupled with more interviews to increase accuracy and decrease ambiguities and subjective judgments is recommended for future studies. On the macro level, more qualitative methods such as in-depth interviews and participant observations plus more subjective interpretation of the events should be combined with the quantitative research in further studies. Still further studies are recommended to investigate other related fields such as the relationship between multiple intelligences and reading comprehension or oral

communication, etc. In this way, the functions of multiple intelligences in EFL education would be expanded and verified on the basis of more detailed data.

6.3 Summary

The last chapter consists of two sections including the conclusion and discussion. The conclusion contains the essentials and refinements of the findings. The discussion involves a consideration of the implications and limitations of the study as well as suggestions for further studies.

This marriage of the multiple intelligences theory and grammatical errors was the starting point of this study. As we know, the MI theory is a model put forth for psychological analysis, whereas the concept of grammatical errors is purely a linguistic concept. Nevertheless, it is the interdisciplinary nature that makes the study creative and original. Of course a scientific study is not science fiction, and the present study is not just combining two unrelated things, because psychology and linguistics, although entirely different subjects, share at least one common area, namely, human beings. The philosophy behind this study is that anything involving the human mind must find its expression in the human language.

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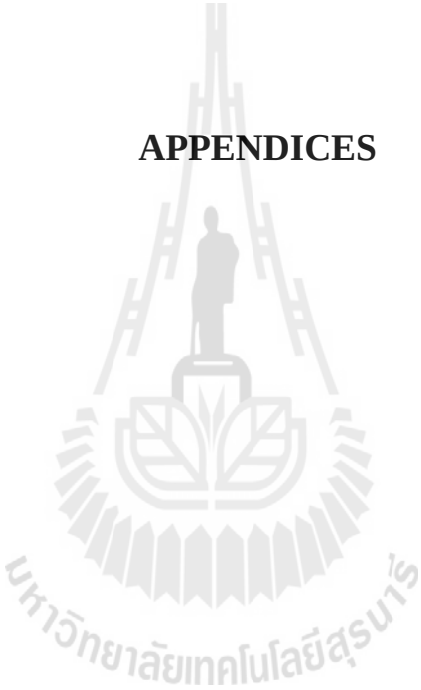
APPENDICES



APPENDIX A

MI Questionnaire of English Version

Multiple Intelligences Questionnaire

Part I

Complete each section by placing a "1" next to each statement you feel accurately describes you. If you do not identify with a statement, leave the space provided blank. Then total the column in each section.

Section 1

_____ I enjoy categorizing things by common traits
_____ Ecological issues are important to me
_____ Classification helps me make sense of new data
_____ I enjoy working in a garden
_____ I believe preserving our National Parks is important
_____ Putting things in hierarchies makes sense to me
_____ Animals are important in my life
_____ My home has a recycling system in place
_____ I enjoy studying biology, botany and/or zoology
_____ I pick up on subtle differences in meaning

_____ TOTAL for Section 1

Section 2

_____ I easily pick up on patterns
_____ I focus in on noise and sounds
_____ Moving to a beat is easy for me
_____ I enjoy making music
_____ I respond to the cadence of poetry
_____ I remember things by putting them in a rhyme
_____ Concentration is difficult for me if there is background noise
_____ Listening to sounds in nature can be very relaxing
_____ Musicals are more engagingto me than dramatic plays
_____ Remembering song lyrics is easy for me

_____ TOTAL for Section 2

Section 3

_____ I am known for being neat and orderly
_____ Step-by-step directions are a big help
_____ Problem solving comes easily to me
_____ I get easily frustrated with disorganized people
_____ I can complete calculations quickly in my head
_____ Logic puzzles are fun
_____ I can't begin an assignment until I have all my "ducks in a row"
_____ Structure is a good thing
_____ I enjoy troubleshooting something that isn't working properly
_____ Things have to make sense to me or I am dissatisfied

_____ TOTAL for Section 3

Section 4

_____ It is important to see my role in the “big picture” of things
_____ I enjoy discussing questions about life
_____ Religion is important to me
_____ I enjoy viewing art work
_____ Relaxation and meditation exercises are rewarding to me
_____ I like traveling to visit inspiring places
_____ I enjoy reading philosophers
_____ Learning new things is easier when I see their real world application
_____ I wonder if there are other forms of intelligent life in the universe
_____ It is important for me to feel connected to people, ideas and beliefs

_____ TOTAL for Section 4

Section 5

_____ I learn best interacting with others
_____ I enjoy informal chat and serious discussion
_____ The more the merrier
_____ I often serve as a leader among peers and colleagues
_____ I value relationships more than ideas or accomplishments
_____ Study groups are very productive for me
_____ I am a “team player”
_____ Friends are important to me
_____ I belong to more than three clubs or organizations
_____ I dislike working alone

_____ TOTAL for Section 5

Section 6

_____ I learn by doing
_____ I enjoy making things with my hands
_____ Sports are a part of my life
_____ I use gestures and non-verbal cues when I communicate
_____ Demonstrating is better than explaining
_____ I love to dance
_____ I like working with tools
_____ Inactivity can make me more tired than being very busy
_____ Hands-on activities are fun
_____ I live an active lifestyle

_____ TOTAL for Section 6

Section 7

_____ Foreign languages interest me
_____ I enjoy reading books, magazines and web sites
_____ I keep a journal
_____ Word puzzles like crosswords or jumbles are enjoyable
_____ Taking notes helps me remember and understand
_____ I faithfully contact friends through letters and/or e-mail
_____ It is easy for me to explain my ideas to others
_____ I write for pleasure
_____ Puns, anagrams and spoonerisms are fun
_____ I enjoy public speaking and participating in debates

_____ TOTAL for Section 7

Section 8

_____ My attitude effects how I learn
_____ I like to be involved in causes that help others
_____ I am keenly aware of my moral beliefs
_____ I learn best when I have an emotional attachment to the subject
_____ Fairness is important to me
_____ Social justice issues interest me
_____ Working alone can be just as productive as working in a group
_____ I need to know why I should do something before I agree to do it
_____ When I believe in something I give more effort towards it
_____ I am willing to protest or sign a petition to right a wrong

_____ TOTAL for Section 8

Section 9

_____ I can visualize ideas in my mind
_____ Rearranging a room and redecorating are fun for me
_____ I enjoy creating my own works of art
_____ I remember better using graphic organizers
_____ I enjoy all kinds of entertainment media
_____ Charts, graphs and tables help me interpret data
_____ A music video can make me more interested in a song
_____ I can recall things as mental pictures
_____ I am good at reading maps and blueprints
_____ Three dimensional puzzles are fun

_____ TOTAL for Section 9

Part II

Now plot your scores on the bar graph provided:

100									
90									
80									
70									
60									
50									
40									
30									
20									
10									
0	Sec 1	Sec 2	Sec 3	Sec 4	Sec 5	Sec 6	Sec 7	Sec 8	Sec 9

Part III

Now determine your intelligence profile!

Key:

Section 1 – This reflects your Naturalist strength
Section 2 – This suggests your Musical strength
Section 3 – This indicates your Logical strength
Section 4 – This illustrates your Existential strength
Section 5 – This shows your Interpersonal strength
Section 6 – This tells your Kinesthetic strength
Section 7 – This indicates your Verbal strength
Section 8 – This reflects your Intrapersonal strength
Section 9 – This suggests your Visual strength

Remember:

- Everyone has all the intelligences!
- You can strengthen an intelligence!
- This inventory is meant as a snapshot in time – it can change!
- M.I. is meant to empower, not label people!

APPENDIX B

MI Questionnaire of Chinese Version

英语学习者多元智能调查表

资料搜集者：华南理工大学广州汽车学院外语系 庄伟
Email: drzhuangwei@gmail.com

该问卷是为搜集英语学习者的多元智能而设计的。研究的主要目的是调查大学英语专业学生的多元智能构成，其结果将有助于在一定程度上帮助老师改进教学方法和提高学生的英语能力。问卷包括两个部分，所有答案没有对错之分，总分不代表成绩。请仔细阅读并认真作答。

第一部分 多元智能

请在适合你的描述项前面标注 “1”，不适合你的描述项前面留空。

第一单元

____我喜欢按照事物的共同特点进行归类。
____生态环境问题对我来说很重要。
____将事物分类有助于我掌握新知识。
____我喜欢园林艺术。
____我认为保护好我们的国家公园很重要。
____我认为按层次排列事物是有意义的。
____动物在我的生活中很重要。
____我家里做到了废物再利用。
____我喜欢学习生物学或者植物学或者动物学。
____我能很快领悟到事物及其意义上的细微差别
____（第一单元总分）

第二单元

____我能轻易地识别图案和模型。
____我对声音很敏感。
____和着拍子进行运动对我来说很容易。
____我喜欢玩音乐。
____我能感知诗歌的韵律。
____我通过押韵的顺口溜记住事情。
____有噪音的时候我很难集中注意力。
____倾听大自然的声音让我很放松。
____音乐剧比戏剧更吸引我。
____我很容易就能记住歌词。
____（第二单元总分）

第三单元

____我被公认为是爱整洁和有条理的人。
____循序渐进的指导对我很有帮助。
____我觉得解决问题很容易。
____跟没有条理的人相处让我很难受。
____我能在大脑里快速完成一般性的计算，不需要外在工具。
____我觉得逻辑推理性的问题非常有趣。
____一切准备妥当以后我才开始工作。
____我认为有序的结构是个好东西。
____我喜欢查找出现了问题的事物的故障。
____我必须理解事物的意义否则就不满意。
____（第三单元总分）
第四单元
____在总体规划中看到自己的作用对我来说很重要。
____我喜欢探讨有关人生的话题。
____信仰问题对我来说很重要。
____我喜欢欣赏艺术作品。
____放松和沉思对我很有益处。
____我喜欢旅游参观鼓舞人心的地方。
____我喜欢读哲学。
____我对那些在现实生活当中已经得以应用的新事物，学习起来比较容易。
____我想知道宇宙中是否有其他形式的智能生命存在。
____我能与其他人、其他思想和其他信念沟通是重要的。
____（第四单元总分）
第五单元
____我非常善于跟他人交往。
____我喜欢聊天和讨论。
____我喜欢扎堆凑热闹。
____我在同学和朋友当中是头儿。
____我认为人际关系因素比个人的理想和成就更有价值。
____学习小组对我很有用。
____我是团队中的一员。
____朋友对我来说很重要。
____我参加了三个以上的社团或组织。
____我不喜欢单独工作和学习。
____（第五单元总分）
第六单元
____我通过实践来学习。
____我喜欢手工制作。
____体育是我生活的一部分。
____说话时我会用到手势和非言语的暗示。
____我认为证明比解释更好。
____我酷爱跳舞。
____我喜欢使用工具的工作。

____闲暇比忙碌更让我疲倦。
____亲身实践其乐无穷。
____我有着积极主动的生活方式。
____（第六单元总分）
第七单元
____我对外语很感兴趣。
____我喜欢读书、看报和浏览网页。
____我写日记。
____字谜很有趣。
____做笔记可以帮助我记忆和理解。
____我坚持不懈地通过书信或电子邮件跟朋友保持联系。
____通过解释，别人很容易理解我的想法。
____我感觉写作是享受。
____修辞艺术很有趣。
____我喜欢演讲和辩论。
____（第七单元总分）
第八单元
____我的态度影响我的学习方式。
____我喜欢做对人有帮助的事情。
____我很清楚自己的道德信念。
____我喜欢的科目学得最好。
____公平对我来说很重要。
____我对社会公正问题很有兴趣。
____单独工作和集体工作一样好。
____在我从事某项工作之前，我要知道为什么。
____对于有价值的工作，我会更加努力。
____为了伸张正义，我愿意参加抗议活动或在请愿书上签字。
____（第八单元总分）
第九单元
____我可以将我头脑里的抽象概念形象化。
____重新整理和重新装修房间是我的乐趣。
____我喜欢创造属于我自己的艺术作品。
____我对利用图形组织的资料记得更好。
____我喜欢多媒体娱乐。
____图表，图形和表格有助于我解释数据。
____如果一首歌被拍成音乐电视会更加吸引我。
____我能形象地回忆起过去的事情。
____我很善于阅读地图和蓝图。
____我对三维拼图很感兴趣。
____（第九单元总分）

第二部分 学生档案

郑重承诺，你的个人信息将高度保密并只用于该研究。在此衷心感谢你的大力支持！

1. 姓名：_____
2. 联系方式 (自愿)：_____
3. 性别：☐男 ☐女
4. 年龄：_____
5. 英语学习起始阶段：☐幼儿园 ☐小学低年级 ☐小学高年级 ☐初中 ☐高中
6. 你的高考英语成绩：_____
7. 你是否听说过多元智能？（若选 B 则跳过第 8 题）（ ） A、是 B、否
8. 你对多元智能有多少了解（ ）A、很熟悉 B、比较了解 C、了解一些 D、不了解

THANK YOU

APPENDIX C

Error Tables

Table of Linguistic Errors for Class One and Two

Name	AV	LV	Noun	Adj	Adv	Conj	Art	Pron	Prep	P.S.	Sum
黄媛婷	3	2	2	3	2		4	1		1	18
蔡晓坤	1		1					1	1	1	5
陈春梅	4	5	4	3				1	3	1	21
陈君怡	2		1						2		5
陈旖旎	1	3	2				1	5	1	4	17
陈颖鹿	1		1				1	2	1		6
陈喆君			3		1		1		3	1	9
邓彦	1	4	4				3		2	2	16
樊秀冰			2	3	1					1	7
关翠虹	2	8	9	6	2			1	1		29
何君男			1	1	6	1		2	1	2	14
何小慧		1	1	1	2	1		1			7
黄伊婷	4	7	4	3	2	4	2	9	4	5	44
赖芳芳	2	1	2	1	1				1		8
赖美霞	4	4	2		1	2		3	2	1	19
李华秀		5	1	1			1	1	1		10
梁浩辉		2	2	2					1		7
梁嘉欣		4	2		1	1		4		2	14
林子翔	3	1	8	1			2	1	3	1	20
刘杰财		2				1			1		4
彭少婷		4	1	1		2	1		3	5	17
王凯奕		1									1
吴晓丹	2	4	1	2		3			3	1	16
吴晓萍					1		3	2	1	1	8
徐思茗	1	1	2			1		2	1	3	11
袁维萍	3	4	3	2		4				2	18
袁子翔		1				2	3		2	2	10
曾碧君			2			1	2	5		2	12
郑毓敏	1	3	3	1	1		2	2	1	3	17
钟兰英		4	2		1			1	2		10
周玲玲	1	1	6				2			3	13

Name	AV	LV	Noun	Adj	Adv	Conj	Art	Pron	Prep	P.S.	Sum
邹婵婵		1	1				2	1			5
段凯欣	1	3	2		1	1			1	1	10
韩佳奇	1	5	4	1	2				1		14
刘伟		5	5	2			3	1	1		17
朱丽	1	3					2	1	1	5	13
Total	39	89	84	34	25	24	35	47	45	50	472
陈俊达	2	4	1			3	1			2	13
陈梦园		5	1	1		1	1	5	3	3	20
邓碧莹	1	1	2		2		1	2	2		11
邓楚欣	1	6	1		1			1	1		11
韩晶晶		1	3					1			5
郝婧		8	3	1	1	1	2		5	6	27
胡丽仪	3	4	4	2	2	1	1	3	6	5	31
黄彬	1			1		1			1		4
黄旭婷		4	1		1	4			1	3	14
江鑫	3	5	1			1		2		1	13
江莹	2	2	3	3			1	1	3	2	17
柯迪晓			1							1	2
黎翠霞								1		1	2
黎子珊	5	4	1		2	2	1	7	1	3	26
李春容	2	4	1			1	1		1		10
李晟骏		2								1	3
李湘漪	2	1	3				2	1	1	1	11
李杨华		5	3	3	2		3	3	1	4	24
厉嘉欣	6	1		1		1	1			1	11
梁诗婷		2	2					2	1		7
梁宇晴	2	1					3	2	4	1	13
梁志豪		1	2				1	1	1		6
林洁蕴		4	1			1	1	1		1	9
林钦丰		1	2	2							5
林苑玲		4	3	2			2	2	3	3	19
毛伟琴	1	1				4		2		4	12
潘彩珍		2	1	1	2	1			4	2	13
束忆然		5	1			1	2		4	1	14
唐思婉	1	4	9	1			1	1	1	1	19
吴嘉骏	3	3	1	1				1		2	11
许可	3	3	5				1	1	1	1	15
许晓锋			1					1	1		3
张紫媚	2	1	1			2	2		2	1	11
郑蔓琼	1	4	3	2		1	3			2	16

Name	AV	LV	Noun	Adj	Adv	Conj	Art	Pron	Prep	P.S.	Sum
朱诗婧	1		1	1			4				7
朱婷婷		1	1				2			2	6
李静	4	3	4			1			1		13
刘超菲	1	2	3	1	1	3	2	2	1	1	17
Total	47	99	70	23	14	30	39	43	50	56	471

Table of Surface Errors for Class One and Two

Name	MS	S	I	MSP	Sum
黄媛婷	7		11		18
蔡晓坤			5		5
陈春梅	5	1	13	2	21
陈君怡	3		2		5
陈旖旎	5	3	8	1	17
陈颖鹿	2	1	1	2	6
陈喆君	3		6		9
邓彦	3	1	10	2	16
樊秀冰		2	5		7
关翠虹	5	1	20	3	29
何君男	2	1	6	5	14
何小慧	2	2	3		7
黄伊婷	11	8	24	1	44
赖芳芳	3		5		8
赖美霞	5	3	10	1	19
李华秀	1	3	6		10
梁浩辉			7		7
梁嘉欣	1	3	10		14
林子翔	8		12		20
刘杰财	2		2		4
彭少婷	3	5	9		17
王凯奕			1		1
吴晓丹	5	2	9		16
吴晓萍	2	4	2		8
徐思茗	1	3	7		11
袁维萍	6	5	7		18
袁子翔	4	5	1		10
曾碧君	3	3	6		12
郑毓敏	2	6	7	2	17
钟兰英			10		10

Name	MS	S	I	MSP	Sum
周玲玲	1		12		13
邹婵婵	2	1	2		5
段凯欣	2		8		10
韩佳奇	1	11	2		14
刘伟	4	1	11	1	17
朱丽	3	3	7		13
Total	107	78	267	20	472
陈俊达	4	1	8		13
陈梦园		3	16	1	20
邓碧莹	3	2	6		11
邓楚欣	2	1	8		11
韩晶晶			5		5
郝婧	8		19		27
胡丽仪	5	8	17	1	31
黄彬	1	1	2		4
黄旭婷	5	1	8		14
江鑫	4	2	7		13
江莹	7	3	7		17
柯迪晓	1		1		2
黎翠霞	1		1		2
黎子珊	9	4	12	1	26
李春容	3		6	1	10
李晟骏			3		3
李湘漪	5	1	5		11
李杨华	6	4	14		24
厉嘉欣	1	2	8		11
梁诗婷		2	5		7
梁宇晴	7	1	5		13
梁志豪	3	1	2		6
林洁蕴	1	5	3		9
林钦丰			5		5
林苑玲	4	3	12		19
毛伟琴	5	2	5		12
潘彩珍	5	3	5		13
束忆然	4	5	5		14
唐思婉	4	1	14		19
吴嘉骏	1	1	9		11
许可	2		13		15
许晓锋	1		2		3
张紫媚	7		4		11

Name	MS	S	I	MSP	Sum
郑蔓琼	4	1	11		16
朱诗婧	3	1	3		7
朱婷婷	2		4		6
李静	3	4	6		13
刘超菲	5	6	6		17
Total	126	69	272	4	471

APPENDIX D

Multiple Intelligences Table of Two Classes

Name	Naturalist	Musical	Logical	Existential	Interpersonal	Kinesthetic	Verbal	Intrapersonal	Visual	Sum
黄媛婷	2	4	3	3	4	3	1	4	2	**26**
蔡晓坤	4	4	10	6	5	8	3	7	10	**57**
陈春梅	6	6	5	5	5	6	6	6	5	**50**
陈君怡	8	6	8	10	7	7	7	9	8	**70**
陈旖旎	5	5	7	6	4	9	8	8	6	**58**
陈颖鹿	7	9	6	7	5	6	6	9	7	**62**
陈喆君	4	9	5	8	6	5	7	10	9	**63**
邓彦	3	4	2	5	3	4	4	4	2	**31**
樊秀冰	4	4	3	4	4	2	4	9	2	**36**
关翠虹	4	6	5	6	6	6	8	8	8	**57**
何君男	5	6	5	8	6	7	7	6	5	**55**
何小慧	3	1	2	3	7	3	2	6	2	**29**
黄伊婷	5	6	5	7	6	7	6	7	6	**55**
赖芳芳	3	6	4	5	6	2	5	7	2	**40**
赖美霞	2	1	4	4	1	4	3	4	2	**25**
李华秀	6	8	8	8	3	5	5	8	2	**53**
梁浩辉	5	6	7	7	6	8	8	5	7	**59**
梁嘉欣	7	6	4	5	7	6	5	8	4	**52**
林子翔	4	6	9	5	9	9	6	7	5	**60**
刘杰财	6	5	6	7	5	5	8	8	5	**55**
彭少婷	7	8	5	7	3	8	4	8	4	**54**
王凯奕	6	2	9	7	4	7	5	6	5	**51**
吴晓丹	5	4	4	4	4	5	4	8	3	**41**
吴晓萍	4	0	4	5	1	3	1	6	1	**25**
徐思茗	5	5	8	6	5	5	4	7	2	**47**
袁维萍	5	6	5	6	6	7	5	7	5	**52**
袁子翔	1	6	1	3	6	2	4	1	2	**26**
曾碧君	5	6	4	4	6	3	3	5	4	**40**
郑毓敏	7	4	6	8	5	7	7	8	6	**58**
钟兰英	4	4	5	6	4	4	6	8	3	**44**
周玲玲	7	7	7	7	8	7	4	8	7	**62**
邹婵婵	4	7	4	6	5	4	7	9	5	**51**

Name	Naturalist	Musical	Logical	Existential	Interpersonal	Kinesthetic	Verbal	Intrapersonal	Visual	Sum
段凯欣	5	3	2	5	4	1	5	4	3	**32**
韩佳奇	5	4	4	7	4	5	5	7	4	**45**
刘伟	4	4	2	3	3	2	2	4	1	**25**
朱丽	7	3	4	5	4	3	1	5	4	**36**
陈俊达	6	4	3	7	4	6	3	7	5	**45**
陈梦园	2	2	2	5	3	2	1	3	2	**22**
邓碧莹	6	8	7	5	9	10	5	10	7	**67**
邓楚欣	7	5	8	9	5	7	9	9	6	**65**
韩晶晶	7	7	7	9	6	3	5	9	4	**57**
郝婧	2	5	3	3	5	6	7	3	5	**39**
胡丽仪	8	4	6	5	4	6	4	5	2	**44**
黄彬	3	2	2	4	1	4	3	2	5	**26**
黄旭婷	8	4	5	7	8	6	4	7	8	**57**
江鑫	7	5	8	8	4	8	7	10	7	**64**
江莹	7	6	6	6	4	8	4	10	6	**57**
柯迪晓	6	5	6	9	3	5	6	6	6	**52**
黎翠霞	7	1	5	5	1	2	5	6	1	**33**
黎子珊	8	6	5	7	5	7	6	8	9	**61**
李春容	4	6	7	6	6	7	5	5	7	**53**
李晟骏	4	1	4	3	0	2	1	7	4	**26**
李湘漪	6	5	5	6	5	6	3	8	5	**49**
李杨华	6	6	5	9	3	6	5	8	5	**53**
厉嘉欣	4	5	3	8	2	3	7	7	5	**44**
梁诗婷	5	5	5	6	5	6	5	7	6	**50**
梁宇晴	4	5	1	4	6	3	5	4	4	**36**
梁志豪	8	7	7	9	4	9	6	7	8	**65**
林洁蕴	4	1	4	3	1	1	5	2	4	**25**
林钦丰	3	3	3	3	4	2	3	4	3	**28**
林苑玲	7	6	5	8	3	6	7	9	6	**57**
毛伟琴	7	5	8	6	2	8	5	7	7	**55**
潘彩珍	6	7	8	7	6	9	6	7	8	**64**
束忆然	6	5	2	4	8	5	6	8	3	**47**
唐思婉	6	6	5	6	4	6	4	6	6	**49**
吴嘉骏	6	7	8	7	7	6	5	7	6	**59**
许可	8	7	4	9	9	7	7	6	8	**65**
许晓锋	2	7	4	2	6	3	2	9	3	**38**
张紫媚	5	7	6	6	7	6	6	8	5	**56**
郑蔓琼	7	3	5	7	4	5	4	8	6	**49**
朱诗婧	7	4	5	6	5	6	4	7	6	**50**
朱婷婷	6	5	4	5	6	5	3	6	2	**42**

Name	Naturalist	Musical	Logical	Existential	Interpersonal	Kinesthetic	Verbal	Intrapersonal	Visual	Sum
李静	6	5	7	10	5	7	8	10	10	**68**
刘超菲	5	5	4	8	4	7	3	7	6	**49**
Total	**390**	**368**	**374**	**445**	**351**	**396**	**360**	**500**	**364**	**3548**

APPENDIX E

Error Correction Tables of Two Classes

Error Correction Score of Class One

Name	Score
黄媛婷	28
蔡晓坤	26
陈春梅	28
陈君怡	30
陈旖旎	28
陈颖鹿	34
陈喆君	32
邓彦	24
樊秀冰	30
关翠虹	28
何君男	28
何小慧	36
黄伊婷	22
赖芳芳	34
赖美霞	34
李华秀	38
梁浩辉	36
梁嘉欣	24
林子翔	22
刘杰财	24
彭少婷	30
王凯奕	30
吴晓丹	26
吴晓萍	36
徐思茗	22
袁维萍	32
袁子翔	28
曾碧君	26
郑毓敏	32
钟兰英	26
周玲玲	22

Name	Score
邹婵婵	34
段凯欣	30
韩佳奇	30
刘伟	18
朱丽	32
Total	1040

Error Correction Score of Class Two

姓名	Score
陈俊达	16
陈梦园	24
邓碧莹	36
邓楚欣	20
韩晶晶	30
郝婧	24
胡丽仪	24
黄彬	26
黄旭婷	26
江鑫	16
江莹	36
柯迪晓	22
黎翠霞	34
黎子珊	8
李春容	18
李晟骏	20
李湘漪	24
李杨华	10
厉嘉欣	30
梁诗婷	32
梁宇晴	38
梁志豪	24
林洁蕴	30
林钦丰	22
林苑玲	30
毛伟琴	26
潘彩珍	32
束忆然	34
唐思婉	24
吴嘉骏	22

姓名	Score
许可	30
许晓锋	32
张紫媚	36
郑蔓琼	28
朱诗婧	26
朱婷婷	20
李静	28
刘超菲	34
Total	992

Appendix VI

Summary Table of Correlation between MI and Errors

Appendix VII

Writing Samples

Appendix VIII

Error Correction Samples

CURRICULUM VITAE

Zhuang Wei was born in Jiangsu Province of China. He got his BA degree in English in 1999 from Nanjing Normal University, his MA degree in English Linguistics from Guizhou Uinversity in 2007. He studied for his Ph.D degree in English studies in Suranaree University, Thailand from 2007 to 2011.

He had a relatively long experience of being a translator and an interpreter. Before soon he became a full time English teacher in Guangzhou Automobile College. His academic interests include language and brain, sociolinguistics, etc. He can be reached at the email: mrzhuangwei@gmail.com.