The Effects and Students’ Views of Teachers' Coded Written Corrective Feedback:

A Multiple-Case Study of Online Multiple-draft Chinese Writing

by

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TABLE OF CONTENTS

List of Tables .......................................................................................................................... v

List of Figures ........................................................................................................................ ii

Abstract ................................................................................................................................... ix

Chapter One: Introduction ...................................................................................................... 1
  Background of the Study ......................................................................................................... 1
  Statement of the Problem ...................................................................................................... 6
  Purpose of the Study ............................................................................................................ 9
  Research Questions (RQ) .................................................................................................... 10
  Significance of the Study ..................................................................................................... 10
  Definition of Key Terms ...................................................................................................... 11
  Chapter Summary ................................................................................................................ 12

Chapter Two: Literature Review .............................................................................................. 14
  Literature Review Flowchart ............................................................................................... 14
  Theoretical Framework ........................................................................................................ 15
    An Overview of SLA Theories on WCF ........................................................................ 16
    Zone of Proximal Development (ZPD) and Scaffolding ............................................. 20
  Previous Studies on WCF .................................................................................................. 24
    An Overview of the Different Types of WCF ............................................................... 24
    Feedback vs. No Feedback ............................................................................................ 26
  Rationale for Studying Coded Feedback ........................................................................... 32
  Technology and L2 Writing ................................................................................................. 40
  Chinese Writing ................................................................................................................... 47
  Insights from the Previous Studies ..................................................................................... 52
    Contributions to a Deeper Understanding of the Role of WCF .................................. 52
    Major Implication for L2 Writing Instruction ............................................................... 54
    Research Gaps and Limitations ....................................................................................... 55

Chapter Three: Research Methodology .................................................................................. 60
  Research Design .................................................................................................................. 60
  Research Settings ................................................................................................................ 63
    Chinese Program ............................................................................................................... 63
    Student Participants ........................................................................................................ 68
  Participants’ Recruitment .................................................................................................... 70
    The Chinese Teacher in the Study ................................................................................... 72
  Computer-Mediated Online Writing Website ................................................................. 73
An Overview of the Research Procedures .................................................. 77
Instruments .................................................................................................. 81
  Writing Prompts ....................................................................................... 81
  Error Coding Categories .......................................................................... 83
  Pilot Study .................................................................................................. 88
  A Background Questionnaire ................................................................. 93
  Surveys ...................................................................................................... 94
  Interview Questions .................................................................................. 94
Data Analysis Method .................................................................................. 98
  Analysis of Each Source and Trustworthiness ........................................ 98
  Analyses of Survey Data ......................................................................... 99
  Analyses of Interview Data ..................................................................... 100
To Answer RQ 1 ......................................................................................... 102
To Answer RQ 2 ......................................................................................... 115
To Answer RQ 3 ......................................................................................... 116
To Answer RQ 4 ......................................................................................... 116
An Overview of RQs, Data Sources, and Data Analysis ......................... 119

Chapter Four: Results of Within-Case Analysis ....................................... 122
Ben ............................................................................................................. 123
  Ben’s Revision Scores ............................................................................. 124
  Ben: the Characteristics and Distribution of Errors ................................. 127
  Ben’s Views of the Computer-Mediate Coded WCF? ............................... 130
  What Factors Influenced Ben’s Incorporation of Feedback? .................. 132
Mary ........................................................................................................... 134
  Mary’s Revision Scores ......................................................................... 134
  Mary: the Characteristics and Distribution of Errors ............................... 137
  Mary’s Views of the Computer-Mediate Coded WCF? ............................ 139
  What Factors Influenced Mary’s Incorporation of Feedback? ................. 141
Paul ............................................................................................................. 143
  Paul’s Revision Scores .......................................................................... 143
  Paul: the Characteristics and Distribution of Errors ............................... 146
  Paul’s Views of the Computer-Mediate Coded WCF? .............................. 148
  What Factors Influenced Paul’s Incorporation of Feedback? ................... 150
Daniel .......................................................................................................... 152
  Daniel’s Revision Scores ...................................................................... 153
  Daniel: the Characteristics and Distribution of Errors ......................... 155
  Daniel’s Views of the Computer-Mediate Coded WCF? ......................... 158
  What Factors Influenced Daniel’s Incorporation of Feedback? .............. 159
Martha ......................................................................................................... 161
  Martha’s Revision Scores ...................................................................... 161
  Martha: the Characteristics and Distribution of Errors ......................... 165
  Martha’s Views of the Computer-Mediate Coded WCF? ......................... 168
  What Factors Influenced Martha’s Incorporation of Feedback? .............. 169
Rachel ......................................................................................................... 172
  Rachel’s Revision Scores ...................................................................... 172
Chapter Five: Results of Cross-Case Analysis .......................................................... 182

To Answer Research Question One ......................................................................... 182
Revision Rating Scores ............................................................................................ 183
WS Errors ................................................................................................................. 187
IC Errors ................................................................................................................... 189
MGC Errors .............................................................................................................. 190
MW Errors ................................................................................................................. 192

To Answer Research Question Two ......................................................................... 195
Errors for Each Writing Assignment ........................................................................ 195
Different Error Types ............................................................................................... 198

To Answer Research Question Three ...................................................................... 200
Attitudes and Views toward Computer-Mediated Coded WCF ............................... 201
Students’ Views of Multiple-Draft Chinese Writing in CMS ................................. 203
The Teacher’s Interview ............................................................................................ 207

To Answer Research Question Four ......................................................................... 211
Unfamiliar with the Online Indirect Coded WCF ...................................................... 211
Students’ Error Types and Language Proficiency .................................................... 212
The Development of Revision Skills ....................................................................... 217
Students’ Views on Computer-Mediated Coded WCF ............................................ 218
Student Participant’s Beliefs ..................................................................................... 220
Participants’ Understandings about the Purposes of Learning ................................ 221
Other factors: Martha’s Native Language, Time and Carelessness .......................... 222

Use Effect Assessment .............................................................................................. 223

Chapter Six: Discussion, Implications, and Conclusion ......................................... 227
Comparing the Results of the Study with Other Relevant Studies .......................... 227
The effectiveness of WCF ......................................................................................... 227
WCF and Students’ Attitudes .................................................................................... 229
The Effectiveness of WCF and Students’ Views on WCF ........................................ 230

Theoretical Contribution ......................................................................................... 231
Implications for Teaching and Instructional Technology in CMS .......................... 236
Teaching Implications ............................................................................................... 236
Error Categories ...................................................................................................... 238
Teachers’ Instructions on Computer-Mediated Coded WCF .................................... 240
Instructional Technology Implications .................................................................... 242
The Limitations of the Research and Implications for Future Research .................. 249
Conclusion ............................................................................................................... 251

References ................................................................................................................. 255

Appendices ............................................................................................................... 266

Appendix 1: Summary of CF vs. No CF .................................................................. 267
Appendix 2: Summary of Direct CF vs. Indirect, coded CF ........................................271
Appendix 3: Summary of Technology and L2 writing ........................................276
Appendix 4: Four Writing Assignments Prompts ........................................279
Appendix 5: Student Interview Questions ........................................282
Appendix 6: Survey Questions .................................................................284
Appendix 7: Teacher Interview Questions ........................................286
Appendix 8: The Institutional Review Board (IRB) Approved Letter ........287
Appendix 9: Informed Consent Form .............................................................289
LIST OF TABLES

Table 1: Timeline for the Study .................................................................80
Table 2: Coded WCF Chart for Teaching Chinese as a Foreign Language ..........86
Table 3: A List of Students’ Revisions on Each Essay .....................................103
Table 4: Calculating Errors for Each Writing Assignment ................................104
Table 5: Ferris Rating Scale for Revisions ......................................................106
Table 6: Revised Rating Scale for Revisions ...................................................106
Table 7: Revision Rating Form ........................................................................112
Table 8: Frequencies and Percentages of Each Error Type (Four Essays) ........114
Table 9: Summary of Revision Rating Forms for Each Student (Four essays) ....115
Table 10: Use Effect Assessment ......................................................................118
Table 11: An Overview of Research Questions, Data Sources, and Data Analysis ..120
Table 12: A Brief Summary of the Structure of the Within-Case Analysis ..........123
Table 13: Ben’s Revision Rating Form .............................................................124
Table 14: Ben’s Errors in the First Draft of Each Writing Assignment ..............128
Table 15: Ben’s Views on the Computer-Mediated Coded WCF ......................130
Table 16: Mary’s Revision Rating Form ..........................................................134
Table 17: Mary’s Errors in the First Draft of Each Writing Assignment ............137
Table 18: Mary’s Views on the Computer-Mediated Coded WCF ....................139
Table 19: Paul’s Revision Rating Form ............................................................143
Table 20: Paul’s Errors in the First Draft of Each Writing Assignment ..............146
Table 21: Paul’s Views on Computer-Mediated Coded WCF .................................................. 148
Table 22: Daniel’s Revision Rating Form .............................................................................. 153
Table 23: Daniel’s Errors in the First Drafts of Each Writing Assignment .............................. 156
Table 24: Daniel’s Views on the Computer-Mediated Coded WCF ........................................ 158
Table 25: Martha’s Revision Rating Form ............................................................................. 162
Table 26: Martha’s Errors in the First Draft of Each Writing Assignment ............................... 166
Table 27: Martha’s Views on the Computer-Mediated Coded WCF ........................................ 168
Table 28: Rachel’s Revision Rating Form .............................................................................. 173
Table 29: Rachel’s Errors in the First Draft of Each Writing Assignment ............................... 176
Table 30: Rachel’s Views on the Computer-Mediated Coded WCF ........................................ 178
Table 31: Revision Scores (Percentage) ................................................................................. 183
Table 32: WS Errors Revision Characteristics ....................................................................... 187
Table 33: IC Errors Revision Characteristics ........................................................................ 189
Table 34: MGC Errors Revision Characteristics .................................................................... 190
Table 35: MW Errors Revision Characteristics ..................................................................... 192
Table 36: Errors in Each Writing Assignment ....................................................................... 196
Table 37: Number of IC, WS, and MW Errors ..................................................................... 198
Table 38: Attitudes and Views toward Computer-Mediated Coded WCF ................................. 201
Table 39: Students’ Views of the Online Multiple-Draft Chinese Writing .............................. 204
Table 40: Students’ Views of the CMS and Technology .......................................................... 205
Table 41: Use Effect Assessment .......................................................................................... 224
Table 42: A Summary of Different Aspects When Design Course and Studies in Writing .......... 251
LIST OF FIGURES

Figure 1: Literature review flowchart.................................................................15
Figure 2: Student signup..................................................................................74
Figure 3: Assignment requirement ...................................................................75
Figure 4: Use error codes to pinpoint learners’ errors ......................................76
Figure 5: Error statistics ..................................................................................77
Figure 6: Flowchart for research procedure ....................................................97
Figure 7: A tendency line for Ben’s revision scores .........................................127
Figure 8: A tendency line for Ben’s error numbers ..........................................129
Figure 9: A tendency line for Mary’s revision scores .......................................136
Figure 10: A tendency line for Mary’s error numbers ......................................138
Figure 11: A tendency line for Paul’s revision scores .......................................146
Figure 12: A tendency line for Paul’s error numbers .......................................147
Figure 13: A tendency line for Daniel’s revision scores ....................................155
Figure 14: A tendency line for Daniel’s error numbers ....................................157
Figure 15: A tendency line for Martha’s revision scores ...................................165
Figure 16: A tendency line for Martha’s error numbers ...................................167
Figure 17: A tendency line for Rachel’s revision scores ....................................175
Figure 18: A tendency line for Rachel’s error numbers ....................................177
Figure 19: A tendency line for revision scores (total) .......................................184
Figure 20: A tendency line for revision scores (each student) .........................185
Figure 21: A tendency line for WS error revisions.................................................................187
Figure 22: A tendency line for IC error revisions.................................................................189
Figure 23: A tendency line for MGC error revisions ............................................................191
Figure 24: A tendency line for MW error revisions ............................................................193
Figure 25: A tendency line for error numbers for each writing assignment (total).............196
Figure 26: A tendency line for error numbers for each writing assignment.......................197
Figure 27: The process of interactions between teachers and students...............................233
Figure 28: ZPD in the process of providing feedback and collaborating.............................234
Figure 29: The two layers of scaffolding process .................................................................235
ABSTRACT

With the rapid development of Web 2.0 in the field of education, which allows users to interact and collaborate with teachers and peers on the web, many researchers have focused on exploring the developments of using Course Manage System (CMS) in service of L2 writing (e.g., Chun, 2011; Warschauer & Grimes, 2007). Simultaneously, participation in learning and teaching Chinese as a foreign (TCFL) has been accelerating. Learning and teaching Chinese writing plays a significant role in the field of world languages education. In the field of Second Language Acquisition (SLA) and Foreign Language Education (FLE), many studies have examined the effectiveness and efficiency of Written Corrective Feedback (WCF) (e.g., Bitchener, 2008; Ferris, 2010). Existing studies on WCF mostly focused on languages other than Chinese. There were few published studies investigating WCF in a computer-mediated coded WCF Chinese writing setting. This dissertation study applied a multiple-case study design to investigate the effects and students’ views of teachers’ coded WCF in an online multiple-draft Chinese writing setting. Six intermediate-level learners of Chinese completed four writing assignments, four revisions, four surveys, and four interviews.

The dissertation employed a theoretical framework from sociocultural theory: Zone of Proximal Development (ZPD) and Scaffolding. Coded WCF and the CMS are considered as scaffolding, and students’ ability to correct errors is viewed as ZPD. The researcher investigated students’ responses to the computer-mediated coded WCF and the evidence of acquisition in Chinese writing accuracy as reflected in the changes in errors over the course of the semester. In
addition, the researcher also explored the students’ attitudes and views of the computer-mediated coded WCF, and the researcher further examined the factors influencing students’ incorporation of teacher feedback in their writing. The researcher employed within-case analysis and cross-case analysis to report the research findings and study results. Based on the findings, the researcher further discussed the effectiveness of WCF, the theoretical implications, the pedagogical implications, and instructional technology implications.

The research findings revealed that the student participants generally had lower scores in the revision of the first writing assignment, but the situation improved in the revision of the third writing assignment. The evidence of acquisition in Chinese writing accuracy in the positive changes in errors over the course of the semester was associated with the “transferrable error types” rather than the “non-transferrable error types”. Student participants had dynamic attitudes and views toward the computer-mediated coded WCF. The research findings revealed four main factors influencing students’ incorporation of teacher feedback in their writing: the types of errors and Chinese language proficiency levels, students’ familiarity with the computer-mediated coded WCF, changes in students’ self-modifying skills and strategies, and students’ dynamic attitudes and views toward the computer-mediated coded WCF. This dissertation shed light on the instructional design of online courses and CALL activities in the context of TCFL, and the dissertation also filled up a research gap in computer-mediated WCF in Chinese writing.
CHAPTER ONE:
INTRODUCTION

Background of the Study

In recent years, participation in learning and teaching Chinese as a foreign language (TCFL) has been accelerating. According to the annual report of the Office of Chinese Language Council International, in 2015 alone, 430,000 people from around the world participated in the Chinese Proficiency Test (HSK), which is a standardized test of Chinese language proficiency for non-native speakers designed by the Ministry of Education of the People’s Republic of China. The Confucius Institute sponsored by the Ministry of Education of the People’s Republic of China reported that 1,110,000 people enrolled in Confucius classes for learning Chinese in 2015. All these people from different countries, backgrounds, and cultures are learning Chinese, the most widely spoken language in the world, aiming to benefit from learning the language whether it is for business opportunities, academic purposes, or personal reasons. According to a report of Foreign Language Enrollments in K-12 Public Schools from the American Council on the Teaching of Foreign Languages (ACTFL), in 2004-2005, 20,292 students enrolled in Chinese classes in K-12 public schools in the U.S. In 2007-2008, 59,860 students enrolled in those classes, representing an increase of 195%, the largest percentage growth in the K-12 study of any foreign language. ACTFL also reported that Chinese remained the seventh most studied foreign language in the U.S. In 2015, the Modern Language Association (MLA) reported that there were 550 Chinese programs in elementary, junior high, and senior high schools, which represented a
100% increase in two years, and that enrollment in Chinese language classes had increased 51% since 2002 at the college level.

According to the Foreign Service Institute (FSI), a category 1 language is defined as a language closely related to English. English native speakers may need at least 575 class hours to achieve an advanced level in a category 1 language. A category 4 language is defined as a language which is exceptionally difficult for native English speakers: Arabic, Cantonese, Mandarin, Japanese, and Korean are included in category 4. The FSI estimates that students need to have at least 2200 class hours to achieve an advanced level. One year of college class hours totals around 200 hours; therefore, learners of Chinese would need to spend eleven years to achieve the advanced level in Chinese. Because of the difficulties of learning Chinese as a foreign language, it is essential to explore how to learn Chinese efficiently. Shepherd (2014) suggested that a Chinese learner’s ultimate success in learning Chinese will be determined by what the learner does outside of class. Students need to realize that improving Chinese written abilities in the class is not enough; instead, finding an efficient strategy to learn Chinese writing outside of class will play an essential role in improving Chinese writing abilities.

With the increasing numbers of learners of Chinese working for companies, academic institutions, and professional fields in China, employers may have higher expectations for writing abilities of learners of Chinese. For example, since the Ministry of Finance of the People’s Republic of China required all financial institutes to provide financial reports in Chinese when conducting financial activities in China, employers from global banks, investment companies, and accounting firms now expect employees to have the ability to write financial reports and financial analysis reports in Chinese. In addition, with the development of social networks, learners of Chinese may be increasingly required to use Chinese writing for social
purposes, such as communicating with their friends on WeChat (an instant communicating application), posting their thoughts on Weibo (an application similar to Twitter), responding and leaving comments on a social network website, discussing a topic on forums, sending formal E-mails, or leaving comments on commercial websites. It seems that Chinese writing is becoming much more important than before.

Educators of Chinese have noticed that leaners of Chinese in U.S. universities displayed unbalanced developments in oral proficiency and literacy abilities (e.g., Jin, 2009). Learners of Chinese face a gap in learning Chinese writing and need to spend much more time on writing than listening and speaking; thus, many researchers viewed Chinese writing development as a long-term learning process (e.g., Chu, 1998; Jin, 2009; Rifkin, 2005). Researchers found that the use of zero pronouns, topic chains, cohesive devices, Chinese adverbs, and four-characters idioms largely decided syntactic complexity, fluency, and writing maturity (e.g., Han, 2017; Jin, 2009; Xiao, 2010; Zheng, 2002). Learners of Chinese, especially English native-speakers, will face a gap to accurately use these features in Chinese writing. Many studies in the ESL setting have reported that written corrective feedback (WCF) could improve accuracy in students’ writing (e.g., Fathman & Walley, 1990; Ferris & Roberts, 2001). Studies also have revealed the effectiveness of WCF in improving students’ long-term writing accuracy (e.g., Ferris, 2006; Jin & Zhang, 2014). Chinese writing classes usually use direct WCF for improving students’ writing accuracy: students complete their writing assignments on paper, and teachers correct student errors by deleting, replacing, and adding (e.g., Chen, 2012; Jin & Zhang, 2014). However, this method cannot track whether students notice their errors and uptake the knowledge. Some Chinese programs begin applying indirect WCF in multiple-draft settings, in which students complete their writing assignments on paper, teachers pinpoint the errors but do not correct them,
and students are required to revise their own errors based on the WCF before submitting the revised assignments to teachers (e.g., Chen, 2012; Qin, 2014). Students could improve their writing accuracy through the process of revising errors and negotiating the errors with teachers or peers. A weakness of this method is that teachers have to spend a lot of time on providing WCF: Ferris (1999) stated that it is a time-consuming job, and Chen (2012) discussed how a Chinese teacher had to collect students’ first drafts, provide indirect WCF, collect students’ second drafts, and provide final WCF. Teachers might not have sufficient time and energy to continue using this method in Chinese writing classes, and it is also impossible to use this method for students who are taking online Chinese classes. With the rapid development of the Internet and mobile devices, many learners of Chinese do take online Chinese classes, and they may demand that teachers provide corrective feedback online when they are in an internship or in a study-abroad program in China. The improvements of Internet technology could help teachers to save time and energy in providing WCF. Computer-mediated WCF will play an important role in developing long-distance online Chinese classes, enabling teachers to collect students’ writing assignments and provide WCF online and allowing students to save all their writing assignments and track their error types on their personal online account. Computer-mediated WCF could be a scaffolding to help teachers providing WCF. In sum, based on the distinguishing features of writing development in the field of TCFL, it is crucial to apply computer-mediated WCF to provide effective scaffolding for learners’ long-term development in Chinese writing.

In the field of Second Language Acquisition (SLA) writing and Foreign/Second Language Learning (L2) writing, many studies are interested in examining whether WCF helps L2 learners’ uptake of certain types of linguistic forms (SLA-focused research) and investigating
whether WCF helps L2 learners to improve the overall effectiveness of their writing and to become more successful L2 writers (L2 writing-focused research) (e.g., Ashwell, 2000; Bitchener, 2008, 2012; Fathman & Walley, 1990; Ferris, 1999, 2003, 2006, 2010; Russikoff & Kogan, 1996, Truscott, 1996). Indirect WCF refers to teachers’ pinpointing the error to call it to the writer’s attention but not correcting the form. Coded feedback is considered a type of indirect WCF. In the process of giving indirect, coded feedback, teachers label students’ errors with a code, such as a circle to indicate wrong verb tense or an underline to indicate wrong word order. Many studies have reported that coded WCF helps students to edit their writings successfully and coded WCF is a useful technique in improving students’ writing. (e.g., Bitchener, 2012; Ferris, 1999; Lam, 1991; Hyland & Hyland, 2006; Sheen, 2010). By comparing how different forms of WCF affect the student uptake of certain grammatical forms in different ways, many studies have reported that coded WCF helps L2 learners to make improvements in L2 writing more than other forms of WCF (e.g., Lalande, 1982; Ferris & Helt, 2000; Ferris & Roberts, 2001; Ferris & Hedgcock, 2005). Ferris (1999) also stated that WCF is “one of the most time-consuming and exhausting aspects of their jobs” (p.1). Thus, how to effectively incorporate WCF into teachers’ practical teaching has drawn much attention. One type of study has paid attention to employing technology as a scaffolding in providing WCF in SLA writing.

Many researchers have focused on exploring the trends and developments of using Computer-assisted Language Learning (CALL) in service of SLA writing (e.g., Bax, 2003; Chun, 2011; Ducate & Arnold, 2006; Levy & Stockwell, 2006; Pennington, 2003; Warschauer, 2004; Warschauer & Grimes, 2007). With the continuing development of course management system (CMS) technology, applying technologies to SLA has drawn many researchers’ attention (e.g., Mayer, 2009; Sanprasert, 2010; Tsai, 2015). With the increasing demands of distance language
learning and hybrid language learning (e.g., half online and half in-classroom), researchers have pointed out the importance of applying web-based CMS (WCMS) in language teaching (e.g., Blake 2007; Goertle & Winke, 2008; Sanpraset, 2010). A WCMS usually uses Hypertext Preprocessor (PHP) as the fundamental programming language and MySQL (a database management system) for the database. PHP is a mainstream programming language used for many commercial and educational sites: it allows easy connection between the database and web-server. Also, PHP is an open-source platform which allows web designers to insert add-on tools. MySQL is an open-source relational database management system. Using the technology functions of a WCMS, language teachers can tailor activities to fit specific learning goals and objectives. Therefore, employing a WCMS is an important tool to enhance students’ L2 writing outcomes and to help teachers to provide WCF.

There are few published studies investigating WCF in a WCMS-based platform setting. The dissertation research aimed to fill the research gap by discovering the effects and students’ and teachers’ views of computer-mediated WCF. The current study used indirect, coded, and computer-mediated WCF to instruct students or collaborate with students to complete tasks. The study aimed at examining if students perceive the indirect, coded, computer-mediated WCF as appropriate and helpful and if the teachers considered students’ levels and individual needs when providing WCF.

Statement of the Problem

Providing WCF to student writing has inspired much debate in the fields of SLA and L2 writing (e.g., Bitchener, 2012; Ferris, 1999; Truscott, 1996). Several studies reported that WCF helped students to edit their writings successfully and that WCF is a useful technique in improving students’ writing. (e.g., Bitchener, 2012; Ferris, 1999; Lam, 1991; Hyland & Hyland,
On the contrary, several researchers compared students’ writing performances in different groups to provide evidence that WCF had little effect or no effect on L2 writing (e.g., Sheppard, 1992; Semke, 1984; Truscott, 1996). In addition, there is much debate on the effectiveness of different types of WCF on students’ L2 writing (e.g., Chen, 2012; Bitchener & Knoch, 2008; Ferris & Roberts, 2001). Many studies have reported that coded WCF helps L2 learners to make improvements in L2 writing more than other forms of WCF (e.g., Lalande, 1982; Ferris & Helt, 2000; Ferris & Roberts, 2001; Ferris & Hedgecock, 2005); however, other studies demonstrated that direct WCF had a more significant long-term effect than indirect WCF (e.g., Bitchener & Knoch, 2008; Chen, 2012). The differences in these studies may be explained by differences in research methodology including differences in design variables, participants’ proficiency levels, experiment lengths, individual factors, research settings, instructional procedures, and so forth. The research results of these studies are not one-size-fits-all: the research results largely depend on many variables. Therefore, we need to be careful when generalizing research findings.

Existing studies on WCF mostly include research in languages other than Chinese. Chen (2012) pointed out that there is a paucity of studies that addresses teachers’ corrective feedback (CF) in the TCFL context. The researcher investigated the Journal of Chinese Language Teachers Association (JCLTA), which is the most important journal for TCFL in the U.S, and the researcher found only two published research studies related to WCF from 1966 to the present. According to traditional Chinese teaching methodology, most Chinese composition classes employ writing practices such as single-draft writing and direct feedback. We do not know much about coded feedback in Chinese teaching. Therefore, there are questions which need to be asked about indirect, coded, and computer-mediated WCF in multiple-draft settings in the field of
TCFL. For example, can WCF improve Chinese writing accuracy? Are certain types of WCF more effective than others in TCFL context? Can WCF improve accuracy for certain Chinese linguistic forms but not for other Chinese linguistic forms? What are Chinese learners’ responses to different types of WCF? What are Chinese teachers’ reactions to WCF?

As Ferris stated (1999), that providing feedback is “one of the most time-consuming and exhausting aspects of their jobs” (p. 1). Many studies have discussed how to effectively incorporate WCF into teachers’ practical teaching by comparing different types of feedback, examining students’ outcomes, investigating students’ responses, and so forth (e.g., Chen, 2012; Bitchener & Knoch, 2008; Ferris & Roberts, 2001; Semke, 1984; Truscott, 1996). However, most of the studies were conducted on face-to-face interactions or in classroom settings. With the increasing demands of distance language learning and hybrid language learning, technology could help teachers save time and energy in providing WCF, and many students might require teachers to provide WCF in online settings. There is no existing website designed for teachers to provide online WCF in TCFL. We do not know much about computer-mediated WCF in Chinese writing. We do not know if students perceive the computer-mediated WCF as appropriate, or if they can understand the WCF and use it. The researcher designed a website specifically for teachers to use in providing WCF in Chinese writing. In order to discover whether or not students perceived the computer-mediated WCF website as helpful, the researcher collected their responses on usability, accessibility, navigational ease, and user-friendliness of the CMS. In sum, there are few published studies investigating indirect, coded WCF in a Course Management System (CMS)-based platform setting. Therefore, the research aimed to fill the research gap by discovering the relationships between providing indirect, coded, and computer-mediated WCF and L2 writing development.
Purpose of the Study

This study aimed to explore the effects and students’ views of teachers’ indirect, coded, and computer-mediated WCF. It extended previous work that examined and discussed an innovative approach to providing indirect, coded, and computer-mediated WCF based on an online WCF CMS. Previous work showed that indirect and coded WCF correlated with students’ L2 writing development in the context of teaching English as a second/foreign language (ESL/EFL) (e.g., Bitchener, 2008; Bitchener & Knoch, 2008, 2010b; Ferris, 2006; Ferris & Roberts, 2001; Ferris, Liu, Sinha, & Senna, 2013; Sheen, 2007). In this study, the researcher intended to explore the effects of applying indirect and coded WCF in the Teaching Chinese as a Foreign Language (TCFL) context and the Computer-assisted Language Learning (CALL) context. The researcher was interested in discovering what types of errors third-year Chinese students could successfully correct after they receive indirect, coded, and computer-mediated WCF. The researcher was also interested in whether there are certain types of errors that third-year Chinese students would fail to correct after they received indirect, coded, and computer-mediated WCF and what factor(s) would lead to third-year Chinese students’ failing to correct such errors. In addition, the study also considered the perceptions of the students and the teachers regarding the type of WCF (indirect and coded) and the computer-mediated WCF CMS. In sum, the research purposes were 1) to explore students’ responses to the teachers indirect, coded, and computer-mediated WCF in their writing, 2) to explore evidence of acquisition in Chinese writing accuracy in the changes in errors over the course of the semester, 3) to elicit and analyze the views of students and their teachers about using indirect, coded, and computer-mediated WCF in writing, and 4) to examine factors influencing students’ incorporation of teacher feedback in their writing. Therefore, the study may provide implications on how to provide
effective computer-mediated WCF in Chinese writing classes.

**Research Questions (RQ)**

RQ 1: How do students respond to the teachers’ indirect, coded, and computer-mediated WCF in their writing?

1.1) In the first round of computer-mediated WCF, what types of errors do third-year Chinese students correct when they modify their first draft?

1.2) In the first round of computer-mediated WCF, what types of errors do third-year Chinese students fail to correct when they modify their first draft?

RQ 2: What evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester?

RQ 3: What are third-year Chinese students’ and their teachers’ views of the indirect and coded WCF and computer-mediated WCF CMS?

RQ 4: What factors influence students’ incorporation of teacher feedback in their writing?

**Significance of the Study**

The study will provide research implications and technological reflections. First of all, the study will provide insight into the advantages and disadvantages of using a CMS to provide indirect, coded, and computer-mediated WCF. Secondly, the study may shed some light on the types of errors for which indirect, coded, and computer-mediated WCF is useful or produces little or no effect on students’ ability to do self-revisions in CMS settings. Thirdly, there are few published studies investigating indirect, coded WCF in a CMS-based platform setting. The research findings will reflect the effectiveness of integrating computer-mediated WCF into teachers’ practical teaching. Fourthly, most research on WCF was conducted in teaching English as a second language (ESL)/English as a foreign language (EFL) contexts. There is little
published research investigating WCF in the TCFL context. The research findings will provide implications for teachers of Chinese in providing WCF. Fifthly, the background questionnaire, the survey, and the interview with students and teachers may reveal the advantages and drawbacks of providing WCF through the CMS. Based on the research results, the researcher hopes to provide suggestions on how to provide effective computer-mediated WCF, design web-based writing classes, and further develop the functions of the computer-mediated WCF CMS to fulfill the learners’ and teachers’ needs and requirements.

Definition of Key Terms

This section briefly defines key terms in WCF, CALL, and Chinese writing.

1. **Written corrective feedback (WCF)**: WCF was defined by Truscott (1996) as “correction of grammatical errors for the purpose of improving a student’s ability to write accurately” (p.329). Ferris (2003) broadened Truscott’s definition, indicating that WCF included feedback on lexical errors as well as on errors, “including word choice, word form, and collocation, and mechanical errors such as spelling, punctuation, capitalization, and typing conventions” (p.42).

2. **Direct WCF**: (1) teachers directly pinpoint the positions of errors on students’ writing assignments and (2) teachers correct student errors by deleting, replacing, adding, and so forth.

3. **Indirect WCF**: teachers pinpoint the error to call it to the writer’s attention, but the teachers do not correct the form.

4. **Coded WCF**: a type of indirect WCF. In giving coded feedback, teachers label students’ errors with a code, such as a circle to indicate wrong verb tense or an underline to indicate wrong word order (Chen, 2012; Ferris & Roberts, 2001).
5. Course management system (CMS): Course Management Systems (CMS) were developed from Content Management Systems, which were first used in the fields of business, physics, energy resources, and medical management to bring Internet-based automation to many of the administrative aspects of managing and communicating.

6. Chinese writing: Shepherd (2017) identified two distinct processes that the learning/teaching of Chinese writing should deal with: writing as production of the Chinese orthography and writing as composition in Chinese. Learners of Chinese at intermediate-high proficiency level should have the ability to compose coherent and culturally appropriate texts in addition to the ability to form characters in an unfamiliar and non-alphabetic orthographic script, which should be the focus of teaching instruction and curriculum design in the intermediate-low level. In this study, the researcher mainly concentrated on writing as composition in Chinese. This study only focused on feedback given to certain error types rather than others. For example, it focused on feedback given to low-level grammatical errors rather than to more global errors in content. This study also only focused on teachers’ coded feedback rather than how to design error types. For example, it focused on teacher-initiated coded feedback that concentrated on WS, MGC, MW, and so forth. How to pedagogically and grammatically design the error types from the perspective of pure Chinese linguistics is not the main focus of the study.

Chapter Summary

Chapter one is the introduction of the study including research background, statement of problem, purpose of the study, research questions, significance of the study, and definition of the key terms. Chapter two aims to provide a theoretical framework for the study and an overview of the previous research on WCF in the SLA/L2 context. The first part of chapter two discusses an overview of SLA/L2 theories regarding WCF. The second part turns to a discussion of previous
studies on corrective feedback (CF), direct CF, and coded CF. The third part explores the relationship between technology and L2 writing including studies on CALL, CMS, and WCMS. The fourth part reviews previous studies on Chinese writing, and the fifth part discusses insights that have been gained from the previous studies including contributions to a deeper understanding of the role of WCF, major implications for L2 writing instruction, research limitations, and research gaps. Chapter three discusses research design, research settings, participants, instruments for data collection, and data analysis. Chapter four describes the results of within-case analysis in detail and attempts to reveal some research findings. The within-case analysis aims to explore each single case in-depth as a stand-alone unit of analysis. Chapter five uses cross-case analysis aiming to find patterns and trends among six student participants. The cross-case analysis also intends to preserve the richness and uniqueness of the six single cases by building meaningful relationship among the six student participants. Chapter six discusses the research results by comparing the results with other studies and further provide implications to Chinese teaching, CMS designing, and future research.
CHAPTER TWO:
LITERATURE REVIEW

This section aims to provide an overview of the research on WCF in the second/foreign language context. The first part of this section discusses an overview of SLA/L2 theories on WCF. The second part turns to a discussion of previous studies on WCF, the third part explores the relationships between technology and L2 writing, the forth part discusses previous studies on Chinese writing, and the fifth part discusses insights that have been gained from the previous studies. Ferris (2010) viewed research on WCF in terms of two lines: one is second language acquisition (SLA)-focused research and the other is second language writing (L2)-focused research. SLA-focused research is interested in examining whether WCF helps the L2 learner’s uptake of certain types of linguistic forms. L2-focused research investigates whether WCF helps L2 learners to improve the overall effectiveness of their writing and to become more successful writers. Ferris (2010) suggested that these two lines of research are complementary instead of competing and that future studies should learn from each other. The literature review will discuss studies from both SLA and L2 perspectives toward WCF, as shown in Figure 1.

**Literature Review Flowchart**

Figure 1 shows the literature review flowchart.
Figure 1. Literature review flowchart.

**Theoretical Framework**

This section aims to discuss SLA theories and approaches to second language writing which underline WCF research. The first part introduces SLA theories to WCF in two stages: the
first stage elaborates the process approach, particularly multiple-draft writing, and the second stage discusses Krashen’s Monitor Model and Long’s Interaction Hypothesis. The second part aims to provide theories of recent stage that are directly related to the application of indirect, coded, and computer-mediated WCF as a mediator of Chinese writing feedback in the SLA context.

**An Overview of SLA Theories on WCF**

This section discusses the process theory and multiple-draft writing. In the 1970s, the process theory largely influenced teachers’ feedback (Hyland & Hyland, 2006). The process approach encouraged teachers to provide feedback to students through multiple-drafts and encouraged students to revise their errors during the process of writing. Researchers pointed out that feedback had little effect if given only during the final stage, thus, they suggested that teachers apply process approach to allow students to complete multiple-draft papers (e.g., Garrison, 1974; Milner, Milner, & Mitchell, 2012). According to the process-oriented writing approach, teachers’ feedback should take place throughout the writing process in different steps, such as prewriting, drafting, revising, editing, and publishing. In process-oriented classrooms, students are able to engage in several writing activities, such as collaborative activities, peer feedback, one-to-one writing conferences, teacher feedback, and so forth. When applied to the WCF, Ferris (2003) highlighted that teacher WCF is most efficacious when provided on intermediate drafts rather than provided only on the final draft. Researchers often conduct studies of WCF in the process of multiple-draft composition (e.g., Ashwell, 2000; Ferris, 1995a; Ferris & Robert, 2001; Sheen, 2010; Yang & Lyster, 2010). Many researchers have explored the values and implications of integrating WCF into multiple-draft composition (e.g., Chandler, 2003; Ferris, Liu, Sinha, & Senna, 2013; Zamel, 1983). The students demonstrated positive attitudes
toward CF to their multiple-draft writings (e.g., Cohen & Cavalcanti, 1990; Ferris, 1995a; Leki, 1991; McCurdy, 1992).

Early studies on WCF gave great attention to five questions: “Should learner errors be corrected?”, “When should learner errors be corrected?”, “Which learner errors should be corrected?”, “How should learner errors be corrected?”, “Who should correct learner errors?” (Bitchener & Ferris, 2012, p. 20-21). Bitchener and Ferris (2012) suggested that the early studies were based on intuition about what seemed to be effective practice and that they lacked empirical evidence to support their arguments. Ferris (2010) pointed out that in early studies on WCF, vocabulary and grammar were emphasized, and “errors were not tolerated” (p. 183).

This section discusses SLA theories. Krashen's Affective Filter Hypothesis suggested that CF may increase learners’ anxiety and thus have harmful effects on L2 learning. Krashen argued that “error correction was not only unnecessary but potentially harmful in that it raised learners’ affective filters” (cited in Ferris, 2010, p. 184). Truscott (1996) borrowed Krashen’s Hypotheses as a theoretical foundation to negate the value of WCF in helping learners to develop their L2 writing knowledge. He further highlighted that WCF has negative side effects for L2 learners. Ferris (1999) responded to Truscott’s argument, pointing out that one of the weaknesses of Truscott’s argument is the lack of definition for the term error correction, and another disagreement is that Truscott cited many studies which were conducted with diverse groups of subjects. Thus, Ferris concluded that Truscott’s argument is premature and called for further research in WCF.

Long’s Interaction Hypothesis (1996) explained how connecting input, social environments, and learners’ cognitive factors may facilitate L2 development. Long (1996) suggested that “negative feedback obtained during negotiation work or elsewhere may be
facilitative of L2 development, at least for vocabulary, morphology and language-specific syntax, and essential for learning certain specifiable L1-L2 contrasts” (p.414). Hyland and Hyland (2006) stated that based on interactionist perspectives, feedback practices emphasized the relationship between the writer and the “individual reader and the dialogic nature of writing” (p.2). According to the Interaction Hypothesis, the teacher-student interactions that occur in the process of WCF are important, and they assist writers to produce their texts with real meaning in mind. Bitchener and Ferris (2012) argued that CF played an important role in writing development from the interactionist perspective.

Attention and noticing have been at the core of some of the most important theories in second language acquisition research (e.g., Gass, 2003; Schmidt 2010). Schmidt (1990, 2001, 2010) defined the Noticing Hypothesis as “a hypothesis that input does not become intake for language learning unless it is noticed, that is, consciously registered” (Schmidt 2010, p. 721). Tomlin and Villa (1994) discussed three components of attention: alertness, orientation, and detection. Alertness refers to “readiness to receive incoming stimuli”, orientation refers to “direction of resources to stimulus”, and detection refers to “registration of stimulus” (Tomlin and Villa, 1994, p. 265). Gass and Selinker (2013) pointed out that detection is the major component and is what drives learning. Gass and Selinker (2013) suggested that “awareness (through attention) is necessary for noticing, which in turn is essential for learning” (p. 265). Schmidt and Frota (1986) indicated that “a second language learner will begin to acquire the target-like form if and only if it is present in comprehended input and ‘noticed’ in the normal sense of the word, that is consciously” (p. 311). Long (1996) noted that “attention is the mechanism that may be at the heart of the interaction hypothesis…attention, accomplished in part through negotiation is one of the crucial mechanisms in this process” (p. 383). The idea
presented here is related to Chinese WCF in that learning Chinese writing and correcting errors requires learners of Chinese to actively notice and attend to Chinese language forms in order for learning and correcting to take place.

Many researchers have discussed that noticing plays a significant role in second language acquisition (e.g., Gass & Selinker, 2013; Schmidt, 2010). Rosa and Leow (2004)’s research showed that there was a correlation between awareness of a form and the learning of that form. Gass (2003) suggested that focused attention was most beneficial for syntax by comparing learning outcomes from a focused attention group and a non-focused attention group. Mackey (2006)’s study reported that students had more noticing as teachers provided feedback, and there was a relationship between noticing and learning outcomes. Izumi (2002)’s study demonstrated that students showed more noticing and more learning when receiving feedback. Gass and Mackey (2006) created a model of interaction which explains the important relationship of interaction, feedback, attention, and learning.

The discussions of the importance of noticing presented here supported the idea that noticing through feedback could promote learning of Chinese writing and revision. Feedback is an important source of noticing for learners of Chinese. WCF provides learners of Chinese with information about the success of their writing, the lack of success of their writing, and WCF gives learners of Chinese more opportunities to go through comprehension and interaction. Through online multiple-draft WCF, Chinese learners’ attention maybe drawn to some errors of their Chinese language with the possible result that the errors will be successfully revised and learners of Chinese will further intake the knowledge related to the errors, allowing the students to incorporate the knowledge into their Chinese writing development system.
Zone of Proximal Development (ZPD) and Scaffolding

This section aims to provide theories that are directly related to the application of indirect, coded, and computer-mediated WCF as a mediator of Chinese writing feedback in the SLA context. Many of the recent studies have applied sociocultural theory to investigate students’ learning in L2 writing. Vygotsky’s (1978) social cultural theory posits that social interactions between learners plays an essential role in the development of all cognitive functions. According to Vygotsky:

“Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals” (Vygotsky, 1987, p. 57).

Another aspect of Vygotsky’s theory is the Zone of Proximal Development (ZPD). Vygotsky (1978) defined the ZPD as:

“the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, p.86).

When ZPD is applied to learning and teaching, Warchauer (2004) suggested that “collaborative learning, either among students or between students and teachers, is essential for assisting each student in advancing through his or her own zone of proximal development” (p.471). Briner (1999) explained that the zone requires social interaction and assistance to move students to a higher level: thus, interaction and help are types of scaffolded instructions. Effective scaffolding occurs in the ZPD by dividing a task into the elements that are within a
learner’s capacity. Wood, Bruner, and Ross (1976) stated that:

“those elements of the task that are initially beyond the learner’s capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence” (Wood et al., 1976, p. 90).

Vygotsky’s ZPD theory was originally applied to early child education. When researchers applied the theory in a class, they noticed that children could complete more tasks with the help and instructions than they could doing the tasks individually (cited in van der Veer R, 2017, p. 105). The theory suggests that children could learn more based on other people’s help and instruction. According to Vygotsky (1978), this observed behavior was not a coincidence: he pointed out that a child could learn more from cooperating with a person who is more capable than the child in some extent than the child could learn by completing the task independently. He suggested that a learner could imitate a more capable person to a degree that reflected the learner’s own ability to understand knowledge. However, learners are not able to understand everything or imitate all behaviors of a more capable person; learners could not understand the knowledge that far exceed the level of their own understanding ability. He further emphasized that learners could only imitate the new knowledge which were in the area/level where the learners could understand. As such, he defined the ZPD as a distance between the actual developmental level and the level of potential development. The actual developmental level is determined by solving problems by learners independently, and the potential development level is determined by solving problems in collaboration with a more capable person. Therefore, the distance between the actual developmental level and the potential development level will play a significant role in L2 teaching and learning: Researchers, teachers, course designers, policy makers, and curriculum designers need to consider students’ abilities and ask if their students
have the appropriate level of understanding required to imitate the knowledge.

In the 1970s, Wood, Bruner, and Ross (1976) introduced the concept of “Scaffolding” to describe parents’ supportive instructions when they collaborated with their children to complete tasks. Such scaffolding could draw children’s attention to the most important part in a task and parents could divide the task into several sub-tasks in order to provide an easier and more relaxing environment for children to do the task. Once children are able to control the task, the scaffolding is gradually removed, and the task is returned to the children for individual handling. Therefore, parents should provide feedback in different layers, and based on children’s performance, parents would adjust the intervention layers to instruct children. Wood concluded that an effective teacher would play an essential role in Vygotsky’s ZPD theory.

When applied to the field of WCF, scaffolding and the ZPD are activated in the process of providing feedback and collaboration between teachers and students. Many researchers have suggested that when L2 learners acquire appropriate scaffolding, they can achieve higher L2 proficiency levels (e.g., Bitchener, 2012; Lantolf & Thorne, 2007). WCF provides such scaffolding for L2 learners to achieve a higher level in L2 writing. A teacher is able to provide the learner WCF as a kind of scaffolding to assist the students’ evolving understanding of grammar, word order, sentence structure, and so forth, and to further help L2 learners to develop complex writing skills. In recent research, many studies have been influenced by the social-cultural theory. For example, Nassaji and Swain (2000) reported that ZPD-feedback helps the learner move towards self-regulation. Wigglesworth and Storch (2012) suggested that the extent of the ZPD determines whether or not students respond to CF; for example, if there is an inappropriate distance between what a student can learn on her own and what she can learn with help, the student would not to respond to CF. Applying technology as a scaffolding to teaching
L2 writing is also related to the socio-cultural theory. Applying technologies to provide effective scaffolding to activate the ZPD has drawn the attention of many researchers in the field of SLA (e.g., Mayer, 2009; Yao, 2009). In sum, based on the socio-cultural perspective, WCF is viewed as an important factor to help learners to develop L2 writing knowledge.

In terms of the theoretical framework of ZPD and Scaffolding, the current study aimed to support student learning through using a computer-mediated WCF website, and teachers’ coded feedback, which could instruct students or collaborate with students to complete tasks. In the process of completing the task, students could imitate the knowledge as they collaborate with a more capable person, which could improve their Chinese writing abilities. As we mentioned above, Vygotsky (1978) identified the ideal situation as one in which teachers work within every students’ ZPD. Therefore, the study also explored every student’s views and responses to see if every student received effective and helpful instructions. Based on surveys and interviews, the study examined if the process of computer-mediated WCF was in the appropriate ZPD for every student.

The preceding discussion has outlined the main theoretical explanations and approaches to L2 writing which underlie WCF research. Zhu (2010) emphasized the importance of connecting theory and practice in L2 writing, suggesting the bi-directional relationship between theory and practice: theory influences practice by providing approaches to writing development, and practice inspires theory to further development by raising questions. The following parts focus our attention on discussing previous empirical research to demonstrate the effects and values of WCF in the fields of SLA and L2 writing.
**Previous Studies on WCF**

**An Overview of the Different Types of WCF**

Before reviewing previous studies on WCF, this section briefly explains different types of feedback and different positions on WCF.

1. **WCF**: was defined by Truscott (1996) as “correction of grammatical errors for the purpose of improving a student’s ability to write accurately” (p.329). Ferris (2003) broadened Truscott’s definition and indicated that WCF included feedback on lexical errors, and on errors “including word choice, word form, and collocation, and mechanical errors such as spelling, punctuation, capitalization, and typing conventions” (p.42).

2. **Direct WCF**: includes two main features: (1) teachers directly pinpoint the positions of errors on students’ writing assignments and (2) teachers correct student errors by deleting, replacing, adding, and so forth. Those supporting direct WCF suggest that direct WCF reduces confusion L2 learners may have, saves students’ time, offers more explicit feedback, and facilitates immediate improvements (e.g., Bitchener & Knoch, 2010b; Chandler, 2003; Chen, 2012).

3. **Indirect WCF**: “the error is called to the writer’s attention, but the correct form is not given” (Ferris, et. al, 2013, p. 309). Researchers suggested that indirect WCF may lead to long-term growth in writing ability (Ferris, 2010).

4. **Coded WCF**: is considered as a type of the indirect WCF. In giving coded feedback, teachers label students’ errors with a code, such as a circle to indicate wrong verb tense or an underline to indicate wrong word order (Chen, 2012; Ferris & Roberts, 2001). The teachers only code the errors in student writing instead of directly providing the correct forms; this requires students to self-edit the coded errors. For example, teachers indicate students’ errors with a
circle, but teachers do not correct the errors. Then teachers would let students notice the errors and tell students what type of error the circle stands for.

Providing WCF to student writing has drawn the attention of many researchers and inspired debates in the fields of SLA and second language (L2) writing (e.g., Bitchener, 2012; Ferris, 1999; Truscott, 1996). Several studies conducted experimental research that compared the differences among students in different feedback groups in order to examine whether that WCF can improve L2 writing. These studies have reported that students in feedback groups outperformed the no feedback group in accuracy (e.g., Ashwell, 2000; Bitchener, 2008; Fathman & Walley, 1990; Russikoff & Kpgan, 1996). Other studies (e.g., Kepner, 1991; Truscott, 1996) have focused the attention on discussing the effectiveness of teacher WCF in improving students’ writing accuracy. These studies reported that WCF helps students to edit their writings successfully and WCF is a useful technique in improving students’ writing. (e.g., Bitchener, 2012; Ferris, 1999; Lam, 1991; Hyland & Hyland, 2006; Sheen, 2010). Studies have also examined student views on WCF. Most studies of this type reported that students had positive views towards WCF (e.g., Enginarlar, 1993; Leki, 1991; Ferris & Roberts, 2001; McCurdy, 1992; Saito, 1994). McCurdy (1992) administered Cohen’s survey questions to 155 intermediate-level ESL students. She pointed out that students’ responses showed that they were happy to receive WCF and that they felt the feedback was valuable. Enginarlar (1993)’s research showed that 47 freshman EFL students viewed revision as a collaborative learning process between teachers and students: thus, students had positive feelings toward WCF. Saito (1994) provided four types of WCF to 39 students in ESL intensive courses and an ESL Engineering writing class: teacher commentary in margins, direct correction, indirect correction, and no feedback, separately. The survey indicated that students preferred the first three types of teacher WCF over
no feedback. Ferris (1995a) also emphasized that students found teachers’ WCF helpful and that they greatly appreciated teachers’ WCF. In the field of TCFL, many researchers suggested that it is crucial to apply WCF to provide effective scaffolding for learners’ long-term developments in Chinese writing (e.g., Chu, 1998; Lu, 1994; Wen, 1999). Lu (1994) stated that there were rules and patterns in students’ Chinese writing which revealed their learning procedures and Chinese writing abilities; thus, providing CF could help students explore the patterns in their own errors, for example, that they always have errors with zero pronouns.

On the contrary, many studies argued that WCF has no effect on students’ L2 writing improvements (e.g., Kepner, 1991; Semke, 1984; Truscott, 1996). Truscott (1996) analyzed previous research and theoretical problems to propose that CF “had little or no effect on students’ writing ability” (p.330) and even had a negative effect on students’ writing. Semke (1984) concluded that WCF may have a negative effect on students’ attitudes. Kepner (1991) suggested that L2 teachers’ WCF with explicit rule reminders is ineffective for L2 student writing improvements. Truscott and Hsu (2008) insisted that WCF’s significant effect on students’ revisions did not extend to a new writing task performed a week later. The next section discusses studies examining the effectiveness of feedback.

**Feedback vs. No Feedback**

Several studies conducted experimental research that compared the differences among students in different groups in order to discover whether WCF can improve L2 writing, as shown in Appendix 1 (e.g., Bitchener, 2008; Fathman & Walley, 1990; Kepner, 1991; Semke, 1984). Robb, Ross, and Shortreed (1986) investigated whether teacher WCF could improve accuracy in students’ writing. 134 Japanese college freshmen were divided into four treatment groups. All students were required to revise their essays after receiving explicit feedback. The study reported
that all four groups enhanced their accuracy on writing. However, the study lacked a control group, so the result cannot reveal the differences between students who did not receive WCF and the students who received WCF. Russikoff & Kpgan (1996) repeated Fathman & Walley’s (1990) research, and they also found that the groups with feedback received higher holistic scores on the essay than the groups without feedback. Paulus (1999) analyzed 11 undergraduate international students enrolled in a pre-freshman composition writing course, the study found that teacher feedback had a positive relationship with the quality of students’ texts. Paulus reported that students made successful revisions on the surface level and the meaning level, and students’ writing had significant improvements in their third drafts. Ashwell (2000) divided 50 students who were in first-year writing classes into four groups, “content then form feedback, form then content feedback, form and content then form and content feedback (regular feedback), and no feedback” (Ashwell, 2000, p. 236). The study reported that students in three feedback groups outperformed the no feedback group in accuracy. However, these studies lacked a longitudinal research design: while the research results reported immediate effectiveness of WCF, several researchers suggested that it is also important to discover the effectiveness of WCF in a long-term experiment (e.g., Chandler, 2000; Ferris & Roberts, 2001; Lam, 1991; Sheppard, 1992).

Lam (1991) conducted a longitudinal case study of five students to explore how teacher comments shape revision. The study reported that five students made successful revisions in their writing assignments. Ferris and Roberts (2001) conducted a two-semester long study to examine whether WCF helped 72 ESL students in the freshman composition level classes to edit their writings successfully. Students were divided into three groups: indirect coded feedback, indirect un-coded feedback, and no feedback. Ferris and Roberts concluded that “we found substantial, highly significant differences in our subjects’ editing outcomes between the two feedback groups
and the no-feedback group” (p.176). Ferris, Liu, Shiha, and Senna (2013) examined WCF for 14 advanced-level L2 writers through a 16-week longitudinal multiple-case study approach. In their report, focused WCF, revision, and one-to-one discussion were useful techniques in improving students’ writing.

Several studies also discussed the effects of WCF from a perspective of SLA to explore whether WCF facilitated long-term acquisition of particular linguistic features (e.g., Bitchener, Young, and Cameron, 2005; Bitchener and Knoch, 2008; Ellis, Sheen, Murakami, and Takashima, 2008; Sheen, 2010). Bitchener, Young, and Cameron (2005) investigated the effect of WCF on L2 writing in a 12-week long ESL program. They divided 53 intermediate-level ESL learners into two treatment groups in which learners received conference WCF and written only WCF, and one control group with no feedback. The study reported that students in the treatment groups showed significant improvements on accurate use of the simple past tense and the definite article in L2 writing. Bitchener and Knoch (2008) reported a two-month study that examined the value of WCF for 144 migrant and international ESL intermediate-level students on improving their accuracy in the use of English articles. The study indicated that students who received direct CF as well as written and oral meta-linguistic explanation, direct CF as well as written meta-linguistic explanation, and direct CF performed better than those who did not receive WCF on accurate use of English articles. Ellis, Sheen, Murakami, and Takashima (2008) used a pre-test, immediate post-test, and delayed post-test design to explore whether WCF influenced 49 intermediate-level EFL students’ accurate use of English indefinite and definite articles. The study found that treatment groups outperformed the control group which received no WCF both on an error correction test and on a new narrative writing test. Sheen (2010) investigated the different effects of oral and WCF on 143 intermediate-level students’ accuracy in using English
articles. Sheen applied an immediate-posttest and a delayed-posttest research design to examine both short-term and long-term (four weeks) effectiveness of CF on students’ accurate use of English articles. Sheen divided 143 participants into five groups in which four treatment groups received oral recast feedback, WCF, and oral metalinguistic feedback, and one control group received no feedback. The findings showed that, except for an oral recasts group, the two WCF groups and an oral metalinguistic group significantly outperformed the control group in the immediate-posttest and the delayed-posttest (four weeks). Sheen further highlighted that the WCF helped students to improve their accuracy in using English articles.

On the contrary, several researchers compared students’ writing performances in different groups. These studies provided evidence that WCF had little or no effect on L2 writing. Truscott (1996) analyzed previous research and theoretical problems to propose that CF “had little or no effect on students’ writing ability” (p.330) and even had a negative effect on students’ writing. Semke (1984)’s research involved 141 first-year German EFL students who were divided into four groups: 1) comments only, 2) direct correction, 3) direct correction with comments, and 4) indirect correction. The study required students to complete writing assignments, then receive teachers’ indirect feedback, and then find corrections and rewrite the assignment. Semke reported that there were no significant differences among the four groups in written accuracy, and Semke concluded that WCF may have a negative effect on students’ attitudes. Since Semke’s study design lacked a control group, the data cannot reveal the statistical differences between a control group without feedback and treatment groups with feedback. In addition, the study was conducted among novice-level EFL learners. Therefore, it is difficult to conclude that WCF has a negative effect on students’ writing. Sheppard (1992) compared the different effectiveness among direct error correction, conferences, and no feedback. The study reported that there were
no significant differences among these three groups. Polio, Fleck, and Leder (1998) invited 65 intermediate-level ESL students to write four journal entries per week in seven weeks. Their study included two groups: a control group with no feedback and the experimental group which received direct WCF. Researchers decided to use EFT per total T-units (EFT/TT) and number of words in EFTs per total words (WEFT/TW) to measure linguistic accuracy. The research data revealed that there were no significant differences in accuracy between the two groups. Kepner (1991) in an experiment investigated what types of WCF might have relationships with achievement in student writing in L2 Spanish intermediate-level classes. Kepner designed a semester-long experiment with 60 participants. The researcher provided message-related comments and surface error-corrections to students’ writing. Based on the data of the error-counts measures, the study suggested that the L2 teachers’ WCF with explicit rule reminders is ineffective for L2 student writing improvements. Truscott and Hsu (2008) reported a 14-week long research study that investigated the relationships among error correction, revision, and learning. The study consisted of 57 advanced-level EFL graduate students who were divided into a control group (no feedback) and an experimental group who received written CF. Truscott and Hsu applied an ANOVA test and then used a Wilcoxon Rank-sum test to robustly conduct their quantitative analysis. The research results showed that WCF had a significant effect on students’ revisions. However, Truscott and Hsu argued that “error reduction during revision is not a measure of learning” (p. 294). They insisted that WCF’s significant effect on students’ revisions did not extend to a new writing task performed a week later: thus, there is no relation between WCF and students’ improvements in writing abilities. Truscott and Hsu tested students’ writing only one week later. The time elapsed between tasks, the differences between writing tasks or genres, and other variables may have influenced students’ performance, so it is difficult to say
that the effects of WCF on revision did not extend to students’ new writing tasks, and it is not accurate to measure students’ writing abilities and learnings through a new writing task assigned only one week after the original test.

In the field of TCFL, Shepherd (2017) outlines several features of feedback in a teacher training workshop: “among other things, feedback involves motivating students, encouraging behaviors, discouraging behaviors, sparking student interest, setting and maintaining expectations, providing positive feedback on performance, rewarding successful performances, critiquing unsuccessful performances, showing concern for students, correcting language errors, providing negative feedback, coaching, and cheering” (Shepherd, 2017). Shepherd (2017) claims that feedback is valuable to students, that indirect feedback is important for grammar accuracy, and that feedback is a multi-step process.

Shepherd discusses the importance of feedback in the context of TCFL, pointing out that presenting the correct form and comprehensible input to students is not enough: “re-performance after feedback is what allows learners to internalize the new information and accurate form” (Shepherd, 2017). Shepherd provides a linear feedback model for teachers of Chinese: “learner must perform --- feedback is provided --- learner must understand and process feedback --- learner must perform again after making adjustment” (Shepherd, 2017). In addition, Shepherd highlights that “different kinds of errors require different kinds of feedback”. Regarding grammar errors or writing accuracy, Shepherd suggests that teachers must show the student exactly what the error type is and allow students to logically put it together correctly on their own. If teachers recast or give them the correct answer without requiring them to think, there is very little impact on learning. Shepherd further emphasizes that feedback is a multi-step process: teachers must first identify and indicate the error, so the student knows exactly what type of error
it is. It is most effective when the student corrects the error rather than the teacher. Teachers should allow students to find the problem first on their own or guide them to discovering the problem: this is the most powerful form of correction.

Shepherd indicates the value of feedback in TCFL: providing feedback could foster students’ ability to meta-cognitively monitor their own language learning. When teachers provide feedback, students’ self-correction is at the explicit, external level. They have to think about the situation on a metacognitive level. Once teachers foster this kind of behavior, which makes students monitor their own use of the Chinese language and reactions to their use, students will become aware of their Chinese language use on the metacognitive level. The Appendix 1 shows a summary of studies on comparing corrective feedback and no correct feedback.

**Rationale for Studying Coded Feedback**

Matsuda and Silva (2010) proposed the essence of writing, that “writing does not happen in a vacuum; it is always embedded in a rhetorical situation – a particular social and material condition under which written expression and communication take place” (p. 233). Writers who are learning to write in a second language may struggle. Matsuda and Silva (2010) discussed the struggle of L2 writing, saying that “writing in a second language is distinct from and simpler and less effective (in the eyes of L2 readers) than L1 writing. Aside from the acquisition of the second language grammar, the difference between L1 and L2 writing is largely a matter of degree, for all writers continue to develop their language proficiency and genre knowledge” (p. 237). Therefore, determining what types of WCF are more effective than others is a critical issue in efficiently applying WCF in L2 writing and in efficiently developing Chinese learners’ writing proficiency levels. This section offers a focused review and synthesis of research on direct feedback and coded error feedback. This section indicates which grammatical forms have been
examined in the research studies, what research questions have been investigated, what research approaches have been adopted to investigate the research questions, what the benefits are of coded feedback, and what conclusions may be drawn regarding the efficacy of coded feedback when compared to other forms of error feedback, as shown in Appendix 2.

Many studies have focused on discussing how explicit WCF needs to be in L2 writing classes, and studies have also compared the different effects of various types of WCF (e.g., Laland, 1982; Bitchener & Knoch, 2010b; Lyster, 2004; Ferris & Roberts, 2001; Sheen, 2010). Bitchener (2012) suggested that this type of studies have both theoretical and pedagogical meaning. These studies contributed to theoretical understanding of WCF by explaining how the learner uptakes the written feedback. They contributed to pedagogical understanding by helping teachers identify the types of WCF that would help their students the most in L2 classes.

Before reviewing the studies regarding the efficacy of coded feedback, this section briefly synthesizes previous studies on direct WCF. Comparing the differences between direct WCF and coded WCF will reveal the views on both sides. Direct WCF includes two main features: (1) teachers directly pinpoint the positions of errors on students’ writing assignments and (2) teachers correct student errors by deleting, replacing, adding, and so forth. Those supporting direct WCF suggest that direct WCF reduces confusion L2 learners may have, saves students’ time, offers more explicit feedback, and facilitates immediate improvements.

Several studies have discussed the benefits of direct WCF (e.g., Bitchener & Knoch, 2008; Chandler, 2003; Chen, 2012). Chandler’s (2003) study of 500 intermediate-level ESL learners discovered the efficacy of various types of WCF for improvement in the accuracy and fluency of ESL learners’ L2 writing. Chandler’s study found that direct WCF was superior in helping students locate errors and that ESL learners preferred the direct WCF as it is the fastest
and easiest way for them to revise L2 writings. Bitchener, Young, and Cameron (2005) investigated the effect of WCF on L2 writing in a 12-week long ESL program. The research question aimed to explore what type of feedback helped students improve accuracy in prepositions, the simple past tense, and the definite article in L2 writing. They divided 53 intermediate-level ESL learners into four treatment groups: three groups in which learners received different types of direct WCF and one control group with no feedback. The study reported that students in the direct WCF group showed significant improvements on accurate use of the simple past tense and the definite article in L2 writing. Bitchener and Knoch (2008) explored the value of WCF for migrant and international students in ESL writing classes. The study involved 144 intermediate-level ESL students in a two-month program. The study found that direct WCF had a more significant long-term (seven weeks) effect than indirect WCF. Chen (2012) surveyed the preference of 38 intermediate-level learners of Chinese for various types of WCF, and students expressed a preference for direct WCF.

In giving coded feedback, teachers label students’ errors with a code, such as a circle to indicate wrong verb tense or an underline to indicate wrong word order (e.g., Chen, 2012; Ferris & Roberts, 2001). The teachers only code the errors to student writing instead of directly providing the correct forms: this requires students to self-edit the coded errors. For example, teachers indicate students’ errors with a circle, but teachers do not correct the errors. Then teachers would let students notice the errors, tell students what type of error the circle stands for, and require students to revise the errors by themselves. Several researchers supported coded WCF, suggesting that it allowed L2 learners to become involved in the process of correction and self-reflection, as well as in the conversation between teachers and students where scaffolding could occur (e.g., Bitchener, 2012; Ferris & Helt, 2000; Ferris & Roberts, 2001; Ferris &
Hedgcock, 2005). Bitchener (2012) summarized the benefits of coded WCF, saying that “it promotes the types of reflection on existing knowledge or partially internalized knowledge and is more likely to foster deeper processing during the consolidation phase of the learning process” (p. 355). There are two major lines of research on coded error feedback: the first group of studies compared the different effects of direct and coded WCF and demonstrated the values of coded WCF, and they also examined student uptake of specific grammatical forms/structures after receiving coded written feedback, another group of studies discussed student views and preferences toward coded WCF.

By comparing how different forms of WCF differently affect the student uptake of certain grammatical forms, many studies have indicated that coded WCF helps L2 learners to make improvements in L2 writing more than other forms of WCF (e.g., Lalande, 1982; Ferris & Helt, 2000; Ferris & Roberts, 2001; Ferris & Hedgcock, 2005). Lalande’s (1982) study aimed to explore whether coded CF could reduce the number of grammatical errors students made and have positive effects on student L2 writing development. Participants were 60 intermediate-level German EFL students in a 10-week program. They were divided into two groups, with the control group receiving direct WCF, and the experimental group receiving coded WCF. Lalande (1982) provided twelve codes to represent twelve types of grammatical errors. The study conducted two comparison analyses: 1) it compared the scores on grammatical accuracy differences between the control group and the experimental group, and 2) it compared the posttest data for twelve types of grammatical errors. The research reported that students in the coded WCF group had better scores than the students in the direct WCF group, with students in the coded WCF group outperforming their control group counterparts in eleven out of twelve non-lexical error categories. Ferris and Helt (2000) in an AAAL conference talk presented new
evidence on the effects of WCF in L2 writing classes. 92 intermediate-level ESL students were divided into two treatment groups in a semester-long study. Students were required to write four three-draft essays. Students in treatment group ONE received direct WCF, and students in treatment group two received coded WCF. Teachers provided 16 codes representing 16 categories of errors to group two. Ferris and Helt (2000) found that students who received coded WCF showed long-term (one semester) improvement in L2 writing.

Ferris and Roberts (2001)’s study asked how explicit coded WCF needs to be to enable students to successfully revise treatable and untreatable errors in L2 writing classes. Ferris and Roberts categorized verb, noun, and article errors as treatable errors, and word choice and sentence structure errors as untreatable errors. They provided three types of WCF: 1) coded WCF, 2) error identification (underlining the errors) without any code to represent error types, 3) no feedback. 72 university ESL learners were divided into three groups. Students were required to write an essay in the first week of the ESL class, and after two weeks, students received feedback and then revised their errors. Researchers analyzed the percentage of errors corrected, and the data revealed that students in the two WCF groups outperformed the no-feedback group and that there were no significant statistical differences in revising success between the group that received coded WCF and the group that received underlined WCF. They concluded that implicit feedback seemed to help students to revise errors. Ferris suggested that coded WCF helped L2 learners to do self-reflection that may foster L2 learners’ long-term (six weeks) acquisition.

Ferris (2006) explored the effectiveness of coded WCF in improving 92 first-semester freshmen ESL students’ immediate and long-term (15 weeks) writing accuracy. Ferris used 16 codes to mark students’ error categories, which included “word choice, verb tense, verb form,
word form, articles, singular-plural errors, pronouns, run-on, fragment, punctuation, spelling, sentence structure, informal words, idiom, subject-verb agreement, and miscellaneous”. The study was conducted in the multiple-draft setting; students were required to self-revise errors after receiving coded WCF. Ferris analyzed self-editing success and reported that over 81% of the errors marked by coded CF were successfully revised by students. Compared to other error categories, “Idiom” and “subject-verb agreement” categories had significantly lower percentages of successful revision. Ferris concluded that a positive relationship exists between written coded WCF and successful student revision in their L2 writings. Foin and Lange’s (2007) study aimed to discover how successfully 58 ESL advanced learners could revise grammar errors in out-of-class writing when teachers provided coded WCF. The study examined eight error categories: verb tense error, verb form error, modal error, conditional error, word form error, word choice error, subject-verb agreement error, and number error. Students were required to complete multiple-draft writing assignments, and students needed to revise the errors based on coded written CF which marked the eight categories of errors. Foin and Lange compared students’ early drafts and final drafts across the eight error categories, and they reported that the rates of successful revision for the eight error types ranged from 71% to 89%. They suggested that coded WCF may assist students in correcting their errors.

Ferris, Liu, Sinha, and Senna (2013) raised a question: “How do L2 student writers receiving focused, indirect, explicit WCF describe their strategies for applying feedback to existing texts and self-monitoring their writing on subsequent texts?” (p. 311). Compared to Ferris’s study in 2006, the study extended the error codes to 20 categories including the following, “incorrect verb tense, incorrect verb phrase formation, incorrect word form, missing article, missing noun plural marker, lack of subject and verb agreement in number, wrong
preposition, incorrect word order in sentence, wrong word, word choice, missing or unnecessary
comma, spelling error, missing or unnecessary apostrophe, sentence structure error, missing
word(s) in sentence, pronoun reference vague or unclear, incorrect use of pronoun, run-on
sentence, comma splice, sentence fragment” (see Ferris, Liu, Sinha, and Senna, 2013, p. 314).
The study collected data from advanced-level students, including background questionnaires,
early drafts, final drafts, and interviews. The teachers took a focused approach when providing
feedback on each participant’s writing. The research reported that the coded WCF used in
students’ own self-monitoring processes is useful. The students found the interactive learning
through coded WCF to be extremely valuable. Ferris et al. (2013) pointed out that “it is
motivating because it actually gives students practical insights about their own writing
challenges and knowledge that might help them solve those problems” (p.323).

Jin and Zhang (2014) analyzed WCF in terms of error types and compared WCF effects
in TCFL. Participants were in the advanced level in terms of their Oral Proficiency Interview
(OPI). Researchers found that there were five main categories of errors: “word substitution,
fragment-/incorrect chunks, incorrect idiom use, lack of better terms, and level inappropriate
words” (p.97). Then, Jin and Zhang provided WCF, using codes to identify the errors. The
revised writing showed that 59 out of 71 WCF units were successfully revised, meaning the
successful output modification was 83%, partial output modification was 3%, and failed output
modification was 14%. The study found that students’ output modification provided evidence
that coded WCF positively affects TCFL writing. They also concluded that the method of
providing coded WCF, the clarity of the coded WCF, and the teachers’ method of highlighting
the coded WCF may influence the effects of CF in Chinese writing.

Several studies showed that direct and coded WCF have equal effects in helping students
to make progress in accuracy in L2 writing (e.g., Robb et al, 1986; Semke, 1984). Robb et al. (1986) divided 134 Japanese college EFL learners into four groups: direct feedback group, coded in-text feedback, un-coded in-text feedback, and marginal feedback. During a 9-month study, the study examined the total number of errors and reported that there were no significant differences among the four groups. Bitchener and Knoch (2008) were interested in which forms of WCF could help students improve their accuracy in referential indefinite ‘a’ and referential definite ‘the’. The study provided four forms of WCF to 142 ESL students, which included direct meta-linguistic explanation, coded WCF, direct meta-linguistic explanation and oral explanation, and no feedback. After comparing accuracy rates, the study found out that direct and coded WCF were equally effective for ESL students’ short-term (30-minute) L2 writing development. van Beuningen et al. (2008, 2012) reported a similar research result: they investigated whether direct and coded WCF had different values for different types of errors. Intermediate-level students were divided into four treatment groups after a pretest: direct WCF, coded WCF, writing practice, and self-correction revision. The studies reported that both direct and coded WCF were effective for students’ short-term L2 developments; however, direct WCF is better suited for grammatical errors, and coded WCF is better suited for lexical errors and orthographical errors.

Another group of studies discovered student preferences regarding various types of WCF. Ferris (1995a) reported that students paid more attention to corrective feedback, and 93.5% of participants felt that WCF helped them to improve their L2 writing. Ferris (1997) discussed the influence of teacher commentary on student revision. The study found that students paid a great deal of attention to teacher WCF and that students believed that such feedback helped them make effective revisions and improve their L2 writing abilities. Ferris and Roberts (2001) talked about what kinds of grammar feedback students preferred to receive from teachers. Students reported
that they preferred indirect correction with codes rather than other options. Chandler (2003) discussed the efficacy of a teacher correcting errors versus marking errors for student self-correction. Students reported that they preferred self-correction and that they learned more from self-correction. Based on the studies in the literature review, studies have different results depending on the different ways researchers conducted studies. The differences in these studies may be explained by many reasons, such as design variables, individual factors, research setting, instructional procedures, participants proficiency levels, and so forth. In the section of “insights that have been gained from the previous studies” below, we will further explain the different results and discuss contributions of the results to a deeper understanding of the role of WCF. Appendix 2 shows a summary of studies on comparing direct corrective feedback and indirect coded corrective feedback.

**Technology and L2 Writing**

Many researchers have focused on exploring the trends and developments of using CALL in service of SLA writing, as shown in Appendix 3 (e.g., Bax, 2003; Chun, 2011; Ducate & Arnold, 2006; Hubbard, 2009; Levy & Stockwell, 2006; Liontas, 2002; Pennington, 2003; Warschauer, 2004; Warschauer & Grimes, 2007). Pennington (2003) divided the trends of technology-based L2 writing into three stages. The first stage is word processing: textual properties, accuracy concerns, and grammar translation are the main aspects to be considered by teachers and learners in this stage. For example, between the 1970s and 1980s, the computer was used to provide drills and practices for grammar translation and in service of audiolingual learning. In the second stage, networking played a key role, such as integrating E-mail exchanges, lists, newsgroups, bulletin boards, and expanding peer response into teaching second languages. Between the 1980s and 1990s, the Web 1.0 provided a platform for learners to
communicate, and computers and web tools were used for communicative language teaching. The third stage is the Internet and World Wide Web as resources: web pages, web sites, hypertext/hypermedia, and synchronous communication were widely used in foreign language learning. In the twenty-first century, web 2.0 tools, instant video hardware and software, and virtual worlds bring authentic discourses to technology-based L2 teaching and learning, and second language teaching has turned to focus on social interaction and socio-cognitive theory.

The use of Web 2.0 tools in writing classes has seen a rapid change from asynchronous applications (such as Word software) to instant collaborative writing (such as Google Doc). Applying technology to provide effective scaffolding in writing to activate the ZPD has drawn the attention of many researchers in the field of SLA/L2, and scholars have conducted empirical studies to explore the integration of new technologies and L2 learning (e.g., Jin, 2009; Li, 2014). Li (2014) investigated small group interactions on writing tasks by using wiki-collaboration in an English for Academic Purposes (EAP) course at a university in the U.S. Twenty-nine participants worked on two writing tasks within small groups via Wiki Sites. The research result showed that the Wiki Sites played a positive role for students to apply scaffolding strategies throughout collaborative writing processes.

Course Management Systems (CMS) were developed from Content Management Systems, which were first used in the fields of business, physics, energy resources, and medical management to bring Internet-based automation to many of the administrative aspects of managing and communicating (e.g., Martin-Blas & Serrano-Fernandez, 2009; Novo-Corti et al., 2013; Van de Pol, 2001). A CMS is a computer program which can provide tools for teachers and students to use in teaching and learning: such tools include course content organization, communication, assessment, audio- and videoconferencing, artificial intelligence, speech
recognition, pronunciation-training technologies, gradebooks, mobile technologies, and virtual reality (Levy & Stockwell, 2006; Morgan, 2003). With the recent development of Web browsers and script programming languages, a Web-based Course Management System (WCMS) could be run on a Web browser instead of being downloaded and installed on users’ personal computers. Researchers (e.g., Landon & Ronson, 1990; Weller, Pegler, & Mason, 2005) also refer to a CMS as a learning management system (LMS), networked learning environment (NLE), and e-learning space.

With the increasing demands of distance language learning and hybrid language learning (e.g., half online and half in-classroom), researchers have pointed out the importance of applying WCMS’s in language teaching (e.g., Blake 2007; Goertle & Winke, 2008; Sanpraset, 2010). Shepherd (2014) suggested that teachers adopt a new, broader understanding of a “textbook” as “a set of learning materials”. For web-based learning, online education, e-learning, hybrid language learning, and distance language learning, a WCMS could provide complete and systematic online teaching/learning interactive functions to fulfill course needs.

A WCMS usually uses PHP as the fundamental programming language and MySQL for the database. PHP is a mainstream programming language used for many commercial sites: it allows easy connection between the database and web-server. Also, PHP is an open-resource platform which allows web designers to insert add-on tools. Based on the technology functions of a WCMS, language teachers can tailor activities to fit specific learning goals and objectives (Levy, 2006). A WCMS is not a linear type of program, instead, it connects client-based side and server-based database so that 1) teachers are able to communicate with students via online chat; 2) students are able to have a class on a WCMS; 3) students are able to interact with peers through discussion board; and 4) teachers are able to track students’ improvements. Additionally,
L2 learners are able to access learning materials through video and audio files, use a WCMS-based textbook, and store their own information. L2 learners are able to talk with native speakers via video chat, and so forth. Teachers and web developers can work together to insert proper add-on tools or develop new add-on tools to fulfill the needs of the course, thus, the features of a WCMS are open-ended and open to new development. As Levy (2006) said, “Learning management systems provide an environment in which a number of the tools that teachers require to manage a course can be located in one environment…with greater choice comes greater diversity, and this diversity opens up the avenues for further development of ideas and concepts in the future” (p.208).

A second critical feature of a PHP-based WCMS is its compatibility with most operating systems, such as Windows XP, Windows Vista, Windows 7, Windows 8, and Mac OS. Especially important is the fact that it is also compatible with the operating systems of mobile devices, such as IOS for iPhone and iPad, Android systems, and Windows systems for Microsoft phone. The trends and developments of using Apps to teach foreign languages have been drawing the attention of researchers and educational companies around the world (e.g., Chinnery, 2006; Godwin-Jones, 2011; Kukulska-Hulme & Shield, 2007; Song & Fox, 2008). In higher education in the United States, 82% of students own a cell phone (Kvavik, 2005), and Chinnery states that “mobile technologies clearly offer numerous practical uses in language learning” (p.13). Portable device Apps are able to combine advanced hardware (camera, video/audio, eye-tracking, facial identification, Bluetooth, NFC, and so forth) with sophisticated software, and because of the portable advantage of the mobile devices (Chinnery, 2006, p.11), foreign language learners can increasingly benefit from using portable device Apps to learn a foreign language.

Many studies reveal that a CMS is an important method to enhance students’ foreign
-language learning outcomes (e.g., Sanprasert, 2009; Tsai, 2015). Several researchers discussed the effects of using a CMS in teaching foreign languages. Tsai (2015) explored the effects of CMS-assisted EFL writing instruction. The study utilized a Blackboard CMS to support English writing instruction in a blended English research paper writing course for two academic years. Tsai applied a quasi-experimental study method with 96 participants in the control group and 151 participants in the experimental group. Teachers graded students’ papers for grammatical accuracy, vocabulary usage, originality, consistency, and paper organization. Based on an independent t-test, the data showed that the experimental group significantly outperformed the control group in their final drafts. The study revealed that such an instructional model could contribute to increased student learning. Because there are many other variables that may influence the research result, the study cannot definitively say that the instructional model has a causal relationship with student learning. However, based on the data, we can see that in such research settings, using a CMS in an English writing class has benefits for L2 learners.

Other research has explored students’ responses toward using a CMS in language learning, and several research studies have indicated that using a CMS could motivate and guide students to develop self-regulated learning cognitive skills (e.g., Cheng, 2007; Sanprasert, 2009; Tsai & Ernst, 2009). Sanprasert (2009) aimed to identify whether using a CMS as an intervention could change students’ perception and practice in relation to their autonomous learning of a foreign language. The study collected students’ responses through questionnaires and students’ learning journals. The research result suggested that the CMS played a critical role in developing four aspects of learner autonomy: autonomous perception, autonomous behavior, autonomous strategy, and interdependence. Cheng (2007) explored the perceptions of university students toward using a CMS in learning English as a foreign language. The study consisted of 296
participants in ten universities in Taiwan. Cheng applied a descriptive analysis to conduct the research. The research result indicated that students had positive feedback toward using a CMS in learning English, and the students responded that the CMS was very helpful for them to enhance their L2 abilities. Tsai and Ernest (2009) investigated the model and implementation of CMS-assisted EFL reading strategy instruction. The research result reported that the CMS could enhance L2 learners’ reading comprehension. The data from these studies revealed that students have positive attitudes toward using a CMS in L2 learning, and research results showed that students who use a CMS show improvement in their L2 skills. However, the assessments were from homework assignments and achievement tests: using a standard test or a language proficiency test will provide more reliable research data.

Assessment can be more securely and reliably carried out in a WCMS than in a linear type program. A linear type program or a client-based website allows teachers to store test information in a HTML or CSS file, with the possibility that tech-savvy students could find the source code file, check the test resources, and find the correct answers. Later web developers stored information in a separate JavaScript file in order to make the information more secure; however, technically speaking, students who had the necessary computing knowledge could still find the code and check the test information (Levy & Stockwell, 2006). Since a WCMS is a client-based and server-based website and since the server cannot be accessed without a login and password, teachers and web developers could store the test information in the server. A WCMS only allows users to see the contents of the file instead of granting access to the code resources of the file. Teachers’ feedback and assessment scores can be automatically saved into the database for future retrieval (Arneil & Holmes, 2003). Other add-on tools in a WCMS could make video supervision available, which would increase the security of online assessment. Test
proctors are trained by experienced educators and web developers and follow a strict procedure. Even students with advanced programming knowledges would not be able to cheat on such online tests.

WCMS’s are widely used by financial businesses, medical service providers, and commercial management teams, and many educational researchers (e.g., Levy & Stockwell, 2006) say that WCMS’s have the most impact in Computer-Assisted Language Learning (CALL) practice and research. However, the capabilities of WCMS’s remain underutilized in foreign language education. Currently, a WCMS is most frequently used to make announcements, upload files, host discussion forums, store scores, or deliver learning materials (Tsai, 2015). There is no WCMS designed to teach one specific foreign language: all foreign language educators have to use the same WCMS. Thus, using a WCMS in foreign language teaching presents several of limitation. The first major problem is the potentially prohibitive costs: few foreign language programs would like to use a great amount of funds and development time to establish their own WCMS. A WCMS also requires close cooperation between teachers and web developers. Although most WCMS’s provide tools for teachers to develop online courses and learning materials, one of the biggest challenges is the technology skills required for development. As Zamel (1985) mentioned, it is difficult for a busy teacher to provide consistent and systematic WCF. Technology could be a scaffolding to help teachers providing WCF. Studies have shown the benefits of applying technology into teaching foreign language writing (e.g., Jin & Zhu, 2010; Zhao, 2005). Therefore, we need to consider how to develop teachers’ technological skills and provide support for teachers in applying technology in service of teaching foreign language writing. Appendix 3 shows a summary of studies on technology and L2 writing.
Chinese Writing

At the beginning of this section, it is important to clarify the meaning of “writing” in this research. Shepherd (2017) identified two distinct processes that the teaching/learning of Chinese writing should deal with: writing as production of the Chinese orthography and writing as composition in Chinese. Learners of Chinese at intermediate-high proficiency level should have the ability to compose coherent and culturally appropriate texts, not forming characters in an unfamiliar and non-alphabetic orthographic script, which should be the focus of teaching and curriculum design at the intermediate-low level. Chinese is a non-alphabetic and character-based language writing system, and some researchers (e.g., Perfetti, Zhang & Berent, 1992; Wang, Perfetti & Liu, 2003; Shepherd, 2017) have pointed out that the Chinese character being the basic unit of meaning in the written language and Chinese writing system presents a high contrast to alphabetic systems. Some researchers of Chinese highlighted the importance of learning Chinese writing (e.g., Shepherd, 2017): the Chinese writing system is used for inputting text, sending messages, sending emails, communicating, and surfing the Internet on cell phones and on computers. Writing is especially important means of communication given the variety of dialects used in different areas. Therefore, learners of Chinese need to learn to write Chinese characters in order to communicate with Chinese people in writing mediums, such as in instant messaging platforms, Emails, online discussion boards, online social networks, and so forth.

In contemporary Chinese society, Chinese native speakers use writing to communicate in different scenarios, and with the development of modern technologies and mobile devices, Chinese native speakers use writing to communicate more frequently compared to around thirty years ago when Chinese people mainly wrote letters to communicate. Written Chinese is widely used in China, and Chinese native speakers use WeChat, a Chinese message and social media
application, to communicate. Chinese native speakers write or type short messages on WeChat to communicate with friends, family members, co-workers, business partners, and so forth. In addition, WeChat has a “Pengyou quan” (Friends network) function, which allows users to write short messages and post images to express their feelings on WeChat and then share the posts with their friends. “Wangwang” is an application which is designed for users to communicate with sellers on Taobao.com (a Chinese online shopping website); in addition to this business communication application, many other business communication applications are widely used in China and depend on writing and typing Chinese to communicate, such as food ordering applications, package delivery applications, grocery shopping applications, and so forth. Entertainment applications and websites also require users to write and type Chinese to communicate, such as Bilibili.com, which is a video-sharing website that allows user to type and share 弹幕 “bullet curtain” in Chinese when watching videos, and online gaming applications which require players to write or type Chinese to communicate within the game. News and social media applications also require users to write or type Chinese for communicating and commenting, such as “Weibo” (micro-blogging) and “Jinri Toutiao” (Today News). It seems that the average Chinese native speaker is using writing and reading much more often than before.

Chinese writing is playing a significant role in TCFL and practicing Chinese writing will help learners of Chinese gain expertise in a particular writing community/scenario. Ultimately, as Walker and Noda (2000) suggested, “successful learners compile these presentations into memories that underlie acceptable behavior in cultures and languages that they have yet to experience outside their courses or classrooms…they are trying to remember how to behave in a social environment that will occur in their future” (p. 3). When learners of Chinese begin learning to write Chinese, Shepherd (2017) suggested that they not only be required to learn the
orthographic form of the Chinese characters but also be required to learn new grammatical structures, usage patterns, communications, cultures, and new vocabulary that is exclusive to written contexts.

When we discuss the learning of Chinese writing, accumulating knowledge through correcting errors, such as word substitution (WS), incorrect chunks (IC), and missing grammatical components (MGC) errors, is also very important. When Walker and Noda (2000) discussed how to effectively learn Chinese, they proposed the concept of “compiling knowledge;” suggesting that “learning stories is a part of a larger process of compiling the memories that will support participation in the target culture” (p. 21). They also mentioned that “for a [Chinese] program to be successful, however, its graduates should have accumulated a sufficient level of performance experience and cultural memory to permit them to recognize and learn from new situations. As is the case of any performer, students of a foreign language have to be able to analyze their own performance critically and use that knowledge to develop improved performances.” (p. 18). When the concept of “compiling knowledge” is applied to Chinese writing and revision and the process of correcting errors, learners of Chinese are expected to accumulate sufficient vocabulary, and common syntactical structures and grammar knowledge to be applied to new writing situations. Since learning Chinese writing is a long-term process, learners of Chinese should accumulate sufficient knowledge and develop learning strategies in the process.

Educators of Chinese have noticed that leaners of Chinese in U.S. universities displayed unbalanced development in oral proficiency levels and literacy abilities (e.g., Jin, 2009). Based on the Foreign Service Institute Language Difficulty Rankings, Chinese is categorized as a level four language, which is one of the most difficult languages for English native speakers to master
at the advanced levels. Learners of Chinese face a gap in learning Chinese writing and need to spend much more time on writing than listening and speaking; thus, many researchers viewed Chinese writing development as a long-term learning process (e.g., Chu, 1998; Cui, 2003; Jin, 2007; Rifkin, 2005). In order to achieve advanced level in Chinese, learners of Chinese need to show accuracy, syntactic complexity, and fluency in their writings. Researchers found that the use of zero pronouns, topic chains, cohesive devices, Chinese adverbs, and four-characters idioms largely decided syntactic complexity, fluency, and writing maturity (e.g., Han, 2012; Jin, 2007; Xiao, 2010; Zheng, 2002). However, Chinese cohesive devices, topic chains, Chinese adverbs, and zero pronouns are particularly ambiguous. Chu (1998) mentioned that learners grasped the use of such complicated parts of speech through contextualization. Further explaining the difficulties of such linguistic features, Chu stated that these linguistic features in Chinese writing may not be found in many other languages. Learners of Chinese, especially English native-speakers, will face a gap to accurately use these features in Chinese writing.

Based on the distinguishing features of writing development in the field of TCFL, it is crucial to examine whether technology could provide effective scaffolding for learners’ long-term developments in Chinese writing.

Educators of Chinese have pointed out the significance of employing technology as a scaffolding in the field of teaching Chinese as a foreign language (e.g., Jiang, Wang, & Tschudi, 2013; Jin, 2009; Walker, 2000; Yao, 2009). Yao (2009) discussed the development of utilizing computers to teach Chinese since the 1970s. He pointed out the significance of employing technology in the field of TCFL and further emphasized that technology-based online material provides an excellent scaffolding to activate the ZPD in TCFL. Yao also offered some suggestions for developing websites to accompany textbooks, pointed out that learners of
Chinese could benefit from websites that teach interpersonal and presentational skills, and highlighted the importance of better feedback among learners and teachers. Jin (2009) explored Chinese language learning and instruction within a technology-rich, collaborative and participatory learning environment in terms of the effects of three different types of web tools: discussion boards, blogs, and Skype. Blogs offered participants more opportunities to generate and respond to conversation, and they gave participants more modes (spoken, written, etc.) in which to communicate. The conclusion was that blogs elicited the highest degree of interactivity and participation. Cai and Zhu (2012) conducted an empirical study to explore the motivations of first-year Chinese students toward an online learning community project. The participants wrote reflective journals, posted samples of pronunciation, and provided feedback to other participants. The research result showed that there was a significant difference in the learning experience between the online group and the offline group. In addition, the questionnaire showed that most participants had a positive experience of the online project. Jiang, Wang, and Tschudi (2013) explored the advantages and challenges of web-based platforms based on examining their own web-based intercultural exchange project, "China-USA Business Cafe." The platform broke through a significant limitation of traditional in-class cultural learning, in which the only input was the students’ single cultural perspective. In contrast, the web-based platform involved student-centered teaching methods. The communications between Chinese students and U.S. students played an important role in the class, and teachers acted as "coaches" to guide them in playing the game of communicating in Chinese language and culture. Wang (2013) explored Chinese language learners’ social communication in Chinese on Facebook. The research result revealed that students' using Facebook had a positive impact for their writing abilities.
Insights from the Previous Studies

Contributions to a Deeper Understanding of the Role of WCF

Based on the timeline of the studies in the literature review, studies have different results depending on the time during which they were conducted and on the different ways they analyzed data, such as different structures the studies examined, learners’ proficiency levels, the length of experiments, and so forth. For example, Ferris (2001) suggested that coded WCF is effective for long-term L2 writing development. However, more recent studies reported that applying direct CF is better for students’ long-term L2 writing development (e.g., Bitchener & Knoch, 2010b; van Beuningen et al, 2008, 2012). Truscott (2005) argued that WCF had little value in L2 writing development, while a number of studies have proved that WCF has positive effects on L2 writing development. While different studies seem to have conflicting results, the conclusion is not that WCF plays two opposing roles in students’ second language writing development. Rather, the earlier studies laid the groundwork for a deeper understanding that the roles of WCF in students’ L2 writing development largely depend on many variables, such as research purposes, research questions, research methods, research settings, instructional procedures, participants, and so forth. In other words, the research results of these studies are not one-size-fits-all: teachers cannot take the findings of one research study and think they would certainly work well for all L2 writing classes.

The differences in these studies may be explained by many reasons. First of all, in the early stage of comparison studies, several studies lacked a control group: thus, those studies could not accurately report the differences between students who received WCF and students who did not receive WCF. Secondly, there were different design variables in the studies, such as re-writing tasks, new writing tasks, the linguistic features under study, different foreign...
languages, and so forth. The third reason is that students were at different proficiency levels: the effects of WCF on students at advanced levels were different from those students at intermediate levels. The fourth reason is that most of the studies focused on quantitative research designs, and a call continued to be made for more qualitative research designs to facilitate a deeper understanding of the quantitative data and to possibly reveal other variables or reasons leading to the research results. There are many other variables that may have relationships with the research results, such as students’ learning attitudes, students’ learning styles, students’ motivations, and so forth. Researchers may also need to examine the interactions among these variables.

Based on the differences mentioned above, in order to have a deeper understanding of the role of WCF in students’ L2 writing development, several factors are synthesized to help us understand the roles of WCF. First of all, several key questions have been widely discussed in previous studies: 1) Does teacher WCF improve students’ writing? 2) Of various kinds of WCF (Direct feedback, Indirect feedback, and Meta-linguistic feedback; Focused WCF or unfocused WCF), are certain types more effective than others? 3) Is WCF effective on accuracy for certain linguistic forms? For instance, previous studies have discussed verb tense, articles, singular-plural, and so forth, with some studies reporting that direct CF is better for grammatical errors and coded WCF is better for lexical errors (e.g., van Beuningen et al., 2008, 2012), and 4) What are students’ views on different forms of WCF? The second factor is basic research settings: subjects, sample size, and research duration. Studies need to consider the characteristics of subjects: for example, what second/foreign language they are learning, what proficiency level they are in, what are their cultural backgrounds, and what formal grammar knowledge they have. Sample size is related to research methods; quantitative research may require larger sample sizes in order to increase the internal and external validity, reliability, and confidence interval, while
qualitative research may focus attention on the responses of small groups of participants in order to have deeper insights about the effects of the type of WCF used in the study. Whether the study is conducted in a short-term or a long-term program may also influence the effects of WCF: many studies have shown that WCF has different effects in different durations of instructional treatment (e.g., Ferris and Roberts, 2001; Ferris, 2006; Robb et al., 1986). Thirdly, studies have presented various instructional procedures. The type of writing investigated in previous studies has included new task writing, single-draft writing, multiple-draft writing, in-class writing, out-of-class writing, and summarizing writing. Thus, to discuss the effects of WCF, we also need to be concerned about the type of writing students use and the instructional contexts they are in.

The fourth factor is research design: the settings for control group(s) and treatment group(s), the usage of pretests and posttests, measurement method(s), and statistical analysis may affect the effects of WCF. In addition, multiple raters could increase the reliability of the research result, which could improve the internal validity and external validity of the research results.

**Major Implication for L2 Writing Instruction**

It is extremely difficult for a busy teacher to provide WCF, especially when the teacher has many students (Zamel, 1985). Ferris (1999) also admitted that WCF is “one of the most time-consuming and exhausting aspects of their jobs” (p.1). Thus, how to incorporate WCF into teachers’ practical teaching has drawn much attention.

Based on previous research on student views, studies have revealed areas where teachers need to improve in providing WCF. Cohen (1987) reported that students had trouble understanding teacher feedback. In student responses, they pointed out that teachers’ WCF sometimes is confusing and not clear. As teachers provide WCF, especially coded feedback, it is important to deliver clear instructions for WCF. Teachers are urged to give students a lecture or a
Q&A section to make sure that the codes are clear and understandable for students. Truscott (1996) indicated that students would shorten and simplify their writing in order to avoid devoting lots of time to correcting errors. Therefore, teachers should adjust their teaching schedules and re-think the grading rubrics in order to encourage students to pay attention to revision. Ferris (2003) indicated that although most students appreciated error CF, they also expressed a strong preference for written praise. Thus, she suggested that teachers could provide WCF that mixed error correction and praise. Swain and Lapkin (2002) found that if teachers tried to corrupt students’ original meanings, students would have negative attitudes toward WCF. Swain and Lapkin (2006) reflected that if WCF violated student beliefs about language conventions, it would result in no uptake of the WCF. Wen (1999) suggested that how clearly teachers provided the corrective feedback and how students dealt with the corrective feedback also played an important role in the effects of CF. Goldstein (2010) elaborated that “effective feedback doesn’t start with the text and isn’t just about responding to texts; it starts with the student, responding to the student” (p.76). She further suggested that teachers consider students’ needs and goals and the communication between teachers and students. Chen (2012) concluded that teachers should explain the philosophies and purposes of WCF and the immediate and long-term benefits for students’ L2 writing. She indicated that if students valued WCF, they would have a positive attitude toward revising their L2 writings.

**Research Gaps and Limitations**

TCFL in the U.S. is a relatively new research area, and traditional Chinese pedagogy in the U.S. paid more attention to listening and speaking. Since studies on WCF require large numbers of students in the intermediate or advanced levels, studies on WCF were scarce. Chen (2012) examined previous studies on feedback in the context of TCFL and she concluded that
most research on feedback was conducted in teaching English as second language contexts. There is little published research investigating feedback in a TCFL context. I investigated the Journal of Chinese Language Teachers Association (JCLTA), which is the most important journal for TCFL in the U.S, and I found only two published research studies related to WCF from 1966 to the present. Wen (1999)’s study was a review of previous research in SLA and L2 on WCF. She summarized theories on WCF and discussed implications in TCFL, but there was no systematical research design in her study. Chen (2012)’s study did not discuss the effects of WCF; her qualitative research did not consider students’ learning motivations and attitudes, and her study used a survey but did not have post-survey interviews to more deeply explore why students had such responses. Chen’s research focused on 4th-year Chinese learners, and she suggested that students from other proficiency levels might have different reactions. Jin and Zhang’s research in 2014 applied a qualitative and a quantitative mixed research method: based on the quantitative data, they found the potential questions, then they conducted interviews to find answers from participants. There are still remaining questions which need to be explored on WCF in TCFL. For example, can WCF improve Chinese writing accuracy? There are many types of WCF, such as direct CF and indirect CF, focused CF and unfocused CF, single-draft CF and multiple-draft CF. Are certain types of WCF more effective than others? Can WCF improve accuracy for certain linguistic forms but not for other linguistic forms? What are student responses to different types of WCF? What are teachers’ reactions to WCF? Zhu (2010) suggested the importance of connecting theory and practice in L2 writing and pointed out teachers’ significant role in making instructional decisions for successful application of theory to practice. Thus, teachers need to re-consider the practical questions of how to provide effective WCF and how to provide clear instructions to students for how to respond to WCF. In sum, in
the field of TCFL, researchers on WCF called for future studies to conduct empirical research to explore issues of WCF in the context of TCFL.

Bitchener (2012) pointed out that flaws in research design, research methods, data collection, and data analyses resulted in differences among these studies, and he called for more rigorous research designs. For example, some studies lacked a pretest: researchers need to make sure that students have similar knowledge and are at similar proficiency levels before they participate in the research. The method of measuring the post-test, effect size, and power may also change the research results. Most of the research did not emphasize the reliability of the research, many studies did not control the graders to increase the reliability of the research, which may also have resulted in differences in results. Only a few studies have explored the effects of WCF through a meta-analysis (e.g., Li, 2010; Kang & Han, 2015; Russel & Spada, 2006). Meta-analysis research is a quantitative literature review and synthesis technique that attempts to address the external validity of a set of studies on a common topic. By conducting a meta-analysis of the research on WCF, researchers and teachers can synthesize study results and use the information to decide class/sample size, use of technology in education, use of forms of WCF, etc. In the field of TCFL, Wen (1999) discussed the effects of error corrections in Chinese. She indicated that the effects of CF depended on students’ motivations, goals and L2 proficiency levels. She further suggested that future studies need to strictly control for variables in the process of giving CF, including the types of CF and the method of delivering the CF; she also suggested that student views on CF might influence the research results about the effects of CF.

Many researchers also pointed out the limitations of using surveys to explore students’ responses toward WCF. Most studies were operated in single-draft contexts. Ferris (2003) highlighted that teacher WCF is most efficacious when provided on intermediate drafts rather
than provided only on the final draft. Ferris (1995a) suggested that surveys to elicit student views on WCF be used in multiple-draft settings. Further, most studies were conducted in the context of English as a second/foreign language: Chen (2012) claimed that few studies have explored student views in other L2 contexts, such as Chinese as a second language, Japanese as a second language, and so forth. Student responses in learning Chinese may be somewhat different from responses in an ESL/EFL context. Hedgcock and Lefkowitz (1994) indicated another limitation of studies on student responses. They pointed out that most research participants were English L2 learners. There were few discussions on the response of learners of other languages toward CF. Since students from different countries may have different cultural backgrounds, their responses and attitudes toward WCF may have variations. Truscott (1996) argued that WCF had negative effects on students’ attitudes. He claimed that although students reported that they believe that WCF is a necessary part and a valuable process for improving L2 writing, they do not enjoy the error marks on their writing and feel extremely discouraged by them. Most of the studies were conducted by the instructors of the class, so students taking the classes might not provide negative comments on the surveys, thus influencing the validity of the studies. Many researchers also called for stricter research designs to improve the reliability of this type of research (e.g., Ferris, 2005; Bitchener, 2012). Bitchener (2012) suggested that compared to the number of studies on the relationships between individual learner differences in other aspects of SLA, little research has explored the relationships between learners’ response to WCF and L2 writing. Since there are not sufficient findings on student views toward WCF, it is too early to make any firm conclusions that certain types of student views have causal relationships with the effectiveness of WCF. Researchers have called for future research to explore the relationship between individual attitudes toward WCF and the depth of processing of WCF.
This paragraph summarizes and discusses the research gaps. The researcher found gaps in the following four aspects of research in the field of TCFL: research design, research setting, coded feedback in Chinese teaching, and computer-mediated WCF in Chinese writing. Many studies (e.g., Bitchener & Knoch, 2008; Ferris, 2006) applied a quantitative research design to compare students in different groups in order to explore the effectiveness of feedback and to discuss the effectiveness of different types of WCF on L2 students writing. Few studies applied qualitative multiple-case study design to explore the reasons behind the quantitative data, and few studies explored how students respond to WCF by applying a within case analysis and a cross-case analysis. Based on the studies in the literature review, studies have different results depending on the different ways they were conducted. The differences in these studies may be explained by many reasons, such as design variables, individual factors, research setting, instructional procedures, and so forth. The research results of these studies are not one-size-fits-all: the research results largely depend on many variables. In addition, existing studies on WCF mostly include research in other languages beside Chinese; therefore, we do not know much about coded feedback in Chinese teaching. There are few published studies investigating indirect, coded WCF in a CMS-based platform setting, and we do not know much about computer-mediated WCF in Chinese writing. Therefore, the research aims to fill the research gaps by discovering the relationships between providing indirect, coded, and computer-mediated WCF and L2 writing development.
CHAPTER THREE:
RESEARCH METHODOLOGY

This chapter provides the research methodology used in this explanatory qualitative multiple-case study, including the research design, research settings, rationale for a qualitative multiple-case study design, participants’ recruitment, the computer-mediated online writing website, instruments, pilot study, and the data analysis method. The first goal of this study is to explore students’ responses to teachers’ indirect, coded, and computer-mediated WCF in their writing. The second level of inquiry of this study is to explore what evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester. The third research purpose is to elicit and analyze the views of students and their teacher about using indirect, coded, and computer-mediated WCF in writing, and the fourth research question aims to examine factors influencing students’ incorporation of teacher feedback in their writing. The research design aims to answer the following research questions (RQ) to fulfill the purposes of this study:

RQ 1: How do students respond to the teachers’ indirect, coded, and computer-mediated WCF in their writing?

1.1 In the first round of computer-mediated WCF, what types of errors do third-year Chinese students correct when they modify their first drafts?

1.2 In the first round of computer-mediated WCF, what types of errors do third-year
Chinese students fail to correct when they modify their first drafts?

RQ 2: What evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester?

RQ 3: How do third-year Chinese students and their teachers view the indirect and coded WCF and the computer-mediate WCF CMS?

RQ 4: What factors influence students’ incorporation of teacher feedback in their writing?

Research Design

In this inquiry, the researcher employed a multiple-case study design to explore the effects and students’ views of teachers coded written corrective feedback in online multiple-draft Chinese writing settings. This section discusses the rationale for applying a qualitative multiple-case study design in this study. The study aimed to explore students’ responses to the indirect, coded, and computer-mediated WCF. The researcher decided to apply a qualitative, explanatory multiple-case study method. A case study provides a contextualized and detailed description of the entity under investigation (Duff, 2008). Yin (2013) defined “a case study as an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context” (p.46). Adelman et al. (1976) suggested that there are six major values of a case study in the field of language education. First of all, case studies strongly reflect reality. Secondly, case studies can generalize from an instance to a class. Thirdly, case studies can represent various viewpoints and can provide support to multiple interpretations. The fourth value is that case studies can also supply a database for future research. The fifth value is that findings and implications of case studies may have immediate effects on teacher development, curriculum design, policy-making, and so forth. The sixth value is that the more accessible writing style of case studies is user-friendly. Yin (2013) stated that there are three benefits of a case study: first, a case study “copes
with the technically distinctive situation in which there will be many more variables of interest than data points” (p. 48). The second benefit is that a case study relies on “multiple sources of evidence, with research data needing to converge in a triangulating fashion” (p. 48). The third benefit is that a case study “benefits from the prior development of theoretical propositions to guide data collection and analysis” (Yin, 2013, p. 48).

In defining the case, Yin (2013) pointed out that “the classic case studies usually focus on an individual person as the case” (p. 82): the unit of analysis is the individual participant in each case, and researchers primarily study the individual participant. In this research, the case and the unit of analysis was an individual participant. Data about the individual was collected, and since several such individuals or cases were included in the study, it was a multiple-case study. Yin (2013) discussed the rationale of using multiple cases: multiple cases could provide evidence which could evoke more interest and attention. Multiple-case studies could provide strong, reliable, and powerful evidence to support research because multiple-case studies could be considered as multiple experiments which follow a replication design. In addition, multiple-case studies could predict common trends and differences among participants, as well as further explore the reasons for those trends or differences. Researchers who select two or more cases could conduct a multiple-case study design, and the multiple-case study could involve multiple holistic cases or imbedded cases.

The qualitative case study method has played an important role in WCF research. Ferris et al. (2013) indicate that several studies applying qualitative case study methodology have explored students’ responses to WCF (e.g., Hyland, 2003; Hyland & Hyland, 2001, 2006b; Storch & Wigglesworth, 2010). Through qualitative case study design, researchers have gained insights about WCF beyond the statistical results of quantitative research, and the qualitative
research design and research results have contributed to deeper understandings of students’ and teachers’ views, including those that differ from individual to individual, of WCF. Chen (2012) conducted a case study in which survey and interview data of 38 students showed that students responded favorably to teacher WCF, that students wanted more WCF from teachers, that some students were interested in receiving teacher feedback on language accuracy, and that other students were interested in receiving teacher feedback that address all aspects of writing. Ferris (2003) explained that a qualitative case study could reveal what students think of and need from feedback, which could have long-term consequences for students and teachers. In addition, results of revisions case studies indicate that student views of WCF affect the efficacy of teacher WCF. Cohen (1987) surveyed 217 ESL college students to investigate what reasons caused CF to have little or no effect on revising. The survey data revealed that students’ difficulty in understanding teachers’ WCF led to their failure to correct errors. However, Cohen’s survey data was insufficient to explain the reasons of students’ difficulty in understanding teachers’ WCF. Hedgcock and Lefkowitz (1996) interviewed ESL students, and they reported that the primary reason students failed to correct errors was they did not know what their teachers expected them to do with corrections. In sum, these studies discuss different factors that might explain student variation in viewing WCF and suggest that a qualitative case-study provides a deeper understanding of each individual student’s views rather than using statistics to compare the effects of different types of WCF.

Research Settings

Chinese Program

The researcher conducted the study in a Chinese program in the World Languages Department in a large public research university in the U.S. The Chinese program offers four
levels of Chinese language and culture courses (first-year level, second-year level, third-year level, and advanced level). Students are able to complete one level of Chinese courses in one year (fall semester and spring semester). Based on the program descriptions and the course syllabus, the Chinese program has offered a Chinese minor degree for many years and offers a Chinese major degree starting with the fall semester of 2017, both of which are designed for students “who wish to acquire in-depth knowledge of the Chinese language, culture, literature, society, business, and communicative skills” (cited from course syllabus). The Chinese program offers dynamic Chinese courses for students interested in achieving an advanced-level of Chinese proficiency. Students also have opportunities to attend an intensive summer program in China. In higher levels, the Chinese program integrates Chinese content courses from various academic disciplines, ranging across a wide variety of areas including business, networking, *Shandong Kuaisu* [Shandong fast tales], economics, film, contemporary arts, politics, literatures, cultures, and so forth. The Chinese program has trained students who are among the best learners of Chinese in the nation: several learners have placed in the top three in the Chinese Bridge Competition, which is a national Chinese competition conducted by the Confucius Institute, and most learners in higher-level Chinese courses have achieved advanced level based on the ACTFL proficiency tests.

The teaching philosophy in the Chinese program values team teaching, the teachers and the teaching assistants are assigned to teach Chinese classes and each teacher is responsible for teaching all the classes on his/her assigned day of the week. For example, Teacher A teaches all three classes on Monday, Teacher B teaches all three classes on Tuesday, Teacher A teaches all three classes on Wednesday, and Teacher B teaches all three classes on Thursday. To qualify to teach Chinese classes in the Chinese program, teachers at least hold a master’s degree in Chinese
pedagogy, Chinese languages and literatures, foreign language education, or related fields. Teachers must also take an intensive teacher training program in the summer semester and took a graduate-level course in Chinese pedagogy taught by the director of the Chinese program. In meeting these pre-requisites, pre-service teachers become familiar with the teaching material in the Chinese program, learn Chinese pedagogy and the teaching philosophy used in the Chinese program, learn to cooperate with other teachers in the teaching team, prepare to maintain the same teaching quality, learn grading criteria, and have three to five chances to imitate teaching in the classes. Qualified teachers can teach Chinese classes the following semester. Teachers need to provide group feedback to each class, provide individual feedback to each student after class, and complete a brief teaching report and send it to other teachers on their team and the director. A weekly two-hour mentoring meeting help the teachers to discuss teaching plans and to report teaching to other teachers.

In this section, the researcher discusses how writing is taught and how feedback is provided in the Chinese program. As Shepherd (2017) discussed, the critical prerequisite of being able to recognize, produce, and use Chinese characters is necessary prior to being able to do any of the composition and discourse level tasks. In order for students to learn basic discourse features, the Chinese program has a significantly longer period of pre-writing (preparation for Chinese writing) than in courses studying alphabetic languages. In the first semester of the first-year Chinese course (CHI1120), students learn the fundamental characteristics of written Chinese as well as about 120 Chinese characters. Based on the syllabus of CHI1120, in the writing classes, students need to do pre-writing practices designed to familiarize them with the Chinese writing system and Chinese characters. The pre-writing practices include character breakdowns, filling in the blank with the appropriate character that completes the sentence,
reading each line out loud building up to the longer complete sentences, writing the Chinese words that describe each picture, completing each sentence by filling in the blank, writing Chinese characters for the Pinyin provided, dictation rehearsals, writing the Chinese one would use to handle each situation, and writing complete sentences according to the pictures provided. These writing exercises are displayed on a website, and students write down the answers and turn them in to their teachers, who provide direct error feedback to students. The pre-writing practices aim to develop students’ understanding of a sound base of Chinese characters in order to improve their writing abilities to sentence-level in the following semesters.

In the second semester of the first-year Chinese course (CHI1121), students learn the fundamental characteristics of the written language as well as about 150 new Chinese characters. The writing classes are designed to assist students in developing written skills to produce written Chinese appropriate for routine contexts. In addition to the writing exercises in the CHI1120 classes, the CHI1121 writing classes involve reading short messages, answering questions in Chinese, and completing a story. All the writing exercises are listed on a website; students submit written work to teachers, who provide direct error corrective feedback. Teachers provide opportunities for students to discuss their errors during office hours if students have questions regarding the WCF. The outcome requirements of the syllabus state that students should have the writing abilities to produce sentence-level written assignments. The *Hanyu Shuiping Kaoshi* (HSK) [Chinese Proficiency Test] requires students to learn 174 characters in level 1 and acquires a total of 374 characters in level 2. HSK level 1 is “designed for learners of Chinese who can understand and use some simple Chinese characters and sentences to communicate, and prepares them for continuing their Chinese studies”, and HSK level 2 is “designed for learners who can use Chinese in a simple and direct manner, applying it in a basic fashion to their daily
lives” (Introduction on New HSK Test, p. 17). Therefore, students in the Chinese program achieve HSK level 2 when they complete the CHI1121 course.

Based on the syllabus of the first semester of the second-year Chinese course (CHI2210), students learn 150 new Chinese characters. The writing classes aim to help learners move from phrase-level writing to writing sentence-length summaries of story content. Teachers use short Chinese traditional tales and a Chinese movie (with Chinese subtitles) to teach writing in CHI2210. The written exercises include vocabulary, answering comprehension questions, character breakdowns, and summarizing stories. Once students achieve the sentence level, teachers encourage students to write short essays. Teachers also provide direct WCF. At the end of the semester, teachers instruct students to plan on a short essay assignment for their first task in the second semester of the second-year Chinese class (CHI2212). In the CHI2212 class, students learn 150 new Chinese characters. By the end of the second-year Chinese courses, students should develop the ability to write at the short-essay level. They should be able to complete one mid-length essay (300-400 characters). In CHI2212 writing classes, students are required to complete four tasks. Teachers apply the multiple-draft method and use indirect WCF in their writing process. Students submit the first draft of the essay, and teachers apply coded WCF. After students receive the WCF, they revise the essay for a second submission. At this time, teachers provide direct feedback, after which students revise the essay and submit the final draft. In terms of the HSK written test requirements, Level 3 requires students to recognize a total of 617 Chinese characters. Level 3 is designed for “learners who can use Chinese to serve the demands of their personal lives, studies and work, and are capable of completing most of the communicative tasks they experience during their Chinese tour” (HSK introduction, p.22). Students who complete second-year Chinese courses in the Chinese program have achieved HSK
Level 3 proficiency level.

**Student Participants**

At the outset of their study of Chinese, students often have multiple purposes for taking Chinese courses. Some students complete Chinese level 1 to fulfill a foreign language requirement. Some students in the fields of bio-science, electronic engineering, or computer science aspire to high-tech careers and aim to learn a basic foundation in Chinese language and culture in order to successfully interact with Chinese people. After the first-year Chinese courses, the students who continue taking Chinese classes may have similar motivations. Many students majoring in business and international relationships with the goal of engaging in business activities between the U.S. and China in their future careers pursue the minor degree in the Chinese program. Many learners of Chinese continue learning Chinese aiming to pursue a major degree in Chinese or to prepare for their academic careers in Chinese studies, East Asian Studies, Chinese History, and so forth. Thus, the third-year Chinese courses are designed for highly-motivated students interested in achieving an advanced-level of Chinese proficiency.

Students who enrolled in CHI3242 courses in the spring semester of 2018 must have passed the CHI3241 courses in the fall semester of 2017. According to the syllabus of the third-year Chinese course (Shepherd, 2013), CHI3241 is a course in intermediate spoken Mandarin Chinese. “Particular emphasis is placed on student performance in commonly encountered contexts in Chinese culture, both formal and informal. This is the first course in a two-course sequence of third-year Chinese required for the major and minor in Chinese. CHI3242 is the second course in a two-course sequence of third-year Chinese required for the major and minor in Chinese. CHI3242 aims to train students to achieve intermediate-high level, at which students would be able to engage in sophisticated interaction with Chinese professionals in a range of
contexts, would be able to deal with various forms of Chinese media, such as television, movies, radio, and the Internet, and would be able to develop the capacity to discuss news, politics, economy, culture, history, current events, and so forth. To successfully interact with Chinese professionals in Chinese, students will need to simultaneously develop their ability to produce the Chinese linguistic code and gain familiarity with Chinese interaction patterns and cultural norms. Students attend three kinds of classes during this course: speaking and listening, reading and writing, and movie. The reading and writing class aim to expand students’ lexicon in Chinese through reading articles and essays from major newspapers and periodicals in China, familiarizing students with characteristics of Chinese literary language, teaching bottom-up and top-down reading strategies, and coaching students on effective reading and writing techniques specific to the case of non-alphabetic languages such as Chinese” (cited from CHI3242 syllabus, 2018).

The researcher analyzed students’ final writing tests in the CHI3241 courses in the fall semester of 2017 to ensure that participants were in a similar proficiency level in Chinese writing. The student who entered the CHI3242 courses by taking a placement test was required to take a diagnostic writing task at the beginning of the semester to ensure their Chinese writing proficiency levels were in a similar level with the students who passed the CHI3241 final writing tests.

Research participants included students who enrolled in third-year Chinese courses in the spring semester of 2018 in a Chinese program in the department of World Languages in a large public research university in the U.S. In the spring semester of 2018, the Chinese program offered CHI3242 Advanced Chinese Conversation II with three credit hours. CHI3242 was a required core course for the Chinese minor or the Chinese major. Students who took CHI3242
had usually successfully completed 16 credit hours of coursework in the first-year and the second-year of the Chinese program. The third-year Chinese course included one transfer student who demonstrated his Chinese language proficiency level on a placement test designed by the Chinese program specifically for placing learners of Chinese who had previous Chinese learning experiences in other institutions into the CHI3242 class.

Six students who enrolled in CHI3242 (Advanced Chinese Conversation II) participated in the study in the spring semester of 2018. Students were told that participation in the study was completely voluntary. If students were not willing to participate in the research, it would not influence the grades of their writing assignments. The age range of participants was from 18 to 25. The participants were able to read and speak English and Chinese.

**Participants’ Recruitment**

Regarding case selection, Nunan and Bailey (2009) summarized various rationales for selecting cases: 1) researchers can select cases in terms of the students being interesting or unusual; 2) some selected cases might be prompted by accessible context; and 3) some cases are selected for the ease of access to the students the researchers wish to study. Qualitative research is more flexible with sampling procedures than quantitative research, which reflects the emergent nature of qualitative research design. Patton (1990) identified a number of “purposeful sampling strategies, including extreme or deviant case sampling, intensity sampling, typical case sampling, maximum variation sampling, stratified purposeful sampling, homogeneous sampling, critical case sampling, snowball or chain sampling, criterion sampling, theory-based or operational construct sampling, confirming and disconfirming case sampling, and opportunistic sampling” (p. 65). In this study, six student participants completed the four writing assignments, surveys, and interviews. Therefore, this study applied the convenience case sampling, which involved six
student participants to study. At the beginning of the study, student participants were required to complete a background questionnaire. The results of the background questionnaire were not used for purpose of participant selection, rather, the information helped the researcher interpret the results and might be useful in discussions and implications. The study included six participants who were in the average proficiency levels and have similar backgrounds and typical motivations that could exemplify the more general trends across all students, demonstrate interesting contrasts to one another, and provide valuable implications in designing a WCF website and online writing courses.

The study included six students who enrolled in CHI3242 Advanced Chinese and a teacher who taught CHI3242 in the spring semester of 2018. Six student participants and the teacher participant signed and submitted the informed consent forms, and the six student participants completed all four writing assignments (including all four first-draft writing assignments and all four second-draft writing assignments), surveys, and interviews. At the beginning of the semester, the researcher explained the purpose of the study, participants’ role and demands of the research on the days students were on campus for their classes. The written assignments that students did were already part of the coursework in the third-year Chinese classes. They were not doing the writing just for the purpose of the study. Participation in the study was completely voluntary. I sent the informed consent forms to participants to inform them of the purpose of the study, including:

- Why they were being asked to take part, research design, and research procedures.
- What would happen during this study, benefits, risks or discomfort, and privacy and confidentiality.

I checked their understanding and provided time, both during the information session and
afterwards, for them to ask questions. Participants had two weeks to sign the forms so that they would have ample time to ask questions and decide whether to participate.

**The Chinese Teacher in the Study**

Research participants included a teacher who taught third-year Chinese courses in the spring semester of 2018 in the Chinese program. The teacher is a Chinese native speaker who can read and speak English. The teacher has been teaching Chinese language for four years in the Chinese program, and the teacher has a master’s degree in Teaching Chinese as a Foreign Language. The teacher led one teaching assistant to teach the third-year Chinese courses. The teaching assistant in the class was responsible for teaching speaking in the class. The age of range of the teacher and the teaching assistant was from 30 to 50. As the teaching philosophy in the Chinese program values team teaching, the teacher and the teaching assistant were assigned to teach the third-year Chinese class and each teacher was responsible for teaching assigned content on his/her assigned day of the week. For example, the teacher was responsible for teaching reading and writing sections in the third-year Chinese class, and the teaching assistant was responsible for teaching speaking and listening sections in the third-year Chinese class. The teacher and the teaching assistant attended the teachers’ training program and a Chinese pedagogy course in the Chinese program.

The teacher’s teaching philosophy involved using student-centered teaching methods, integrating process-writing approach into teaching Chinese writing, teaching writing skills to intermediate-level learners of Chinese and integrating technology such as multimedia into Chinese teaching to bring authentic materials, cultures, real-world languages, and feedback to the language classroom. The teacher was interested in integrating technology into teaching Chinese writing in order to help students improve their authentic writing training. The teacher believed that effective
pedagogical guidance, the process-writing approach, the course management system, and written corrective feedback could provide excellent opportunities for learners of Chinese to improve their Chinese writing proficiency levels. These were all good tools that learners of Chinese could take advantage of in the process of effectively studying Chinese.

**Computer-Mediated Online Writing Website**

The online writing website aimed to apply Web 2.0 functions to provide an online platform for teachers to provide indirect, coded, and computer-mediated WCF on students' writing assignments and to allow students to submit and modify their writing assignments online. The website was built on a Content Management System (CMS), and, since the CMS was an open source system, web designers could insert and develop functions based on teaching and learning needs. Teachers were able to add educational functions to the online course by inserting external applications. The external applications would connect with the CMS platform through the Learning Tools Interoperability (LTI is a programming platform to connect the CMS and the external applications). In this research, the researcher started the course, invited students to participate in the online course, and set up some basic navigation and content. The researcher added an external statistics application to calculate students’ errors and inserted an external quiz application for students to complete a quiz before the research. In addition, the CMS allowed teachers who had programming knowledge to add codes to the platform to create some personalized functions to fulfill teachers’ and students’ needs. There researcher wrote some codes in JavaScript to connect the external learning/teaching materials and the colored error codes to the CMS in order to help learners to learn writing and to support teachers to provide coded WCF in the course.
By clicking an assigned link, participants could enter the writing website, create an account, and set up a password. Students were able to use their own personal password-protected account. If students forgot their password, the website provided help in resetting their password by sending a link to their email. The teacher entered a writing assignment on her teacher’s account, and students’ accounts would receive the writing assignment. Students could upload the writing assignment as a PDF file, a jpeg file, or a PNG file to the account and send the assignment to the teachers. Teachers could drag error codes to provide WCF online, save the file, and send it back to students. Students would receive the indirect, coded, computer-mediated feedback, and students would also receive a statistical chart to show their error categories. All these writing assignments were saved on the password-protected online account. Only the student who had the password and authorized teachers were able to login to the account to retrieve the writing assignments. Therefore, students were able to keep all the writing assignments and track their improvements in the account.

Step 1: Joined course, created an account, and set up a password, as shown in Figure 2.

![Student Signup](image)

**Figure 2.** Student signup.
Step 2: Teachers could set an assignment and ask students to submit online. Students could find the assignment requirement on their account and submit their work on the website, as shown in Figure 3.

![Assignment requirement](image)

**Figure 3.** Assignment requirement.

Step 3: Students were required to hand-write a 300-450 character short essay (total four essays in the semester). Students were required to scan or take a picture of their hand-written assignment and submit it via the writing website. There was a large distinction between writing Chinese characters and typing/inputting Chinese characters in a Chinese word processing software: typing Chinese characters required students to know the pronunciation of the character and choose the right character from a Chinese word processing software, while writing Chinese characters required students to have the ability to produce the Chinese orthography. To help students produce the orthography, this step required students to hand-write Chinese characters to practice the actual production of the Chinese writing.

Step 4: Teachers could edit students’ writing assignments on the website: the website had several highlighting tools and codes to allow teachers to provide indirect coded feedback before
sending the edited writing assignment back to students. The codes represented different types of errors. The teacher only used error codes to pinpoint learners’ errors for their first drafts. The codes chart was displayed on the main page of the website, so the teacher and students could easily find the error types on the website, as shown in Figure 4.

Figure 4. Use error codes to pinpoint learners’ errors.

Step 5: The website calculated the error categories and displayed a table to show error statistics, as shown in Figure 5.
Figure 5. Error statistics.

Step 6: After participants received teachers indirect, coded, and computer-mediated WCF, students needed to revise the short essay, type it on the computer, and submit the revised version on the website.

An Overview of the Research Procedures

Before the research, the researcher explained nine types of errors to student participants and provided them example sentences on PowerPoint files in a class. The researcher also uploaded PowerPoint files and example sentences to the course management system, which would allow student participants to download them. The student participants had 20 minutes to ask questions in the class, and if there were any other questions after the class, they could ask the researcher in the following week. After that, the student participants took a quiz in the course management system to make sure that student participants understood the nine types of errors and the processes of online indirect coded WCF. The questions asked whether student participants understood the nine types of errors, whether they had read the coded WCF chart, and if they could identify the error type represented by each code. For example, the questions asked:
what type of error does red circle represent? What type of error does blue circle represent? The online quiz required student participants to make multiple choices. The online quiz allowed student participants to try many times (If they did not answer correctly, the correct answers would not show up). Student participants had to answer all ten questions correctly to pass the quiz. All student participants completed the quiz within a required time. In addition, the first two writing practices required them to write sentences using the vocabulary they had learned, ten sentences at a time. A teacher used indirect coded WCF to provide feedback. These two writing practices aimed to help the teacher and student participants understand the indirect coded WCF procedures and nine types of errors. All student participants completed the two writing assignments. After these two writing practices, they began to write the first writing assignment.

The process of the research was as follows: every Monday, the teacher assigned the participants to write a composition. The student participants needed to scan their first-draft writing assignments and submit them in the learning management system before 11:59 p.m. on Friday. The teacher provided indirect coded WCF in the CMS on Saturday. (The student participants received reminders of the teachers’ feedback only after the teacher published the graded writing assignments after finishing the indirect coded WCF). Meanwhile, another grader with Chinese teaching experience participated in providing indirect coded WCF on the writing assignment. To improve reliability, the teacher and the grader provided indirect coded WCF to participants’ writing assignments independently and sent the feedback to the researcher. On the next Monday, the researcher asked the teacher and the grader to meet for negotiating the WCF differences, so they could exchange their opinions and unify the feedback. After that, the course management system would allow the student participants to check the teacher's indirect coded WCF on Monday night. Then the teacher would require the student participants to submit the
second-draft (revised version) on Friday. During the week after the student participants submitted the second draft, each student participant completed a survey and the teacher provided feedback and graded the participants' second-draft writing assignments. After completing all the above steps, the participants made an appointment with the researcher and had a face-to-face interview. The interview was the final step in the whole drafting process. During the semester, the participants completed four writing assignments; that is to say, they completed the above-mentioned procedure four times.

In order to ensure the reliability of the scores on the second-drafts (the grading criteria will be discussed in the following sections), after the teacher scored the essays by all the student participants, the researcher asked another grader with Chinese teaching experience to randomly select ten essays for grading. Then the researcher analyzed and compared the scores of the ten essays given by the grader and the teacher. Based on the benchmark scales for Kappa’s value, the reliability of the ten essays scored by the teacher and the grader is 0.82, which provided evidence for reliability.

At the beginning of the semester, six participants had filled in and submitted the informed consent forms. The six participants submitted the first-draft and the second-draft of all four writing assignments on schedule and completed questionnaires and interviews on time. The data analysis used four first-drafts and four second-drafts of the four writing assignments of the six participants. Therefore, the study included six participants, 24 first-draft writing assignments, 24 second-draft writing assignments as well as 24 interviews and 24 surveys. The Table 1 showed the timeline for the study.
Table 1. Timeline for the Study.

<table>
<thead>
<tr>
<th>Fall 2017</th>
<th>IRB application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring semester of 2018 (Jan. 8 – May 7)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Workshop</th>
<th>01/02-01/05</th>
<th>Training grading rubric, coded WCF, and CMS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>01/08-01/14</td>
<td>Orientation; Introduction to the research</td>
</tr>
<tr>
<td>Week 2</td>
<td>01/15-01/21</td>
<td>Explain the research; Send consent forms; Explain coded WCF</td>
</tr>
<tr>
<td>Week 3</td>
<td>01/22-01/28</td>
<td>Q&amp;A; Collect consent forms. Background Questionnaire</td>
</tr>
<tr>
<td>Week 4</td>
<td>01/29-02/04</td>
<td>Writing task 1 (1st-draft)</td>
</tr>
<tr>
<td>Week 5</td>
<td>02/05-02/11</td>
<td>Writing task 1 (2nd-draft)</td>
</tr>
<tr>
<td>Week 6</td>
<td>02/12-02/18</td>
<td>Interview 1, Data analysis 1</td>
</tr>
<tr>
<td>Week 7</td>
<td>02/19--02/25</td>
<td>Writing task 2 (1st-draft)</td>
</tr>
<tr>
<td>Week 8</td>
<td>02/26-03/04</td>
<td>Writing task 2 (2nd-draft)</td>
</tr>
<tr>
<td>Week 10</td>
<td>03/05-03/11</td>
<td>Interview 2, Data analysis 2</td>
</tr>
<tr>
<td>Week 11</td>
<td>03/12-03/18</td>
<td>Writing task 3 (1st-draft)</td>
</tr>
<tr>
<td>Week 12</td>
<td>03/19-03/25</td>
<td>Writing task 3 (2nd-draft), interview 3</td>
</tr>
<tr>
<td>Week 13</td>
<td>03/26-04/01</td>
<td>Interview 3, Data analysis 3</td>
</tr>
<tr>
<td>Week 14</td>
<td>04/02-04/08</td>
<td>Writing task 4 (1st-draft)</td>
</tr>
<tr>
<td>Week 15</td>
<td>04/09-04/15</td>
<td>Writing task 4 (2nd-draft)</td>
</tr>
<tr>
<td>Week 16</td>
<td>04/16-04/22</td>
<td>Interview 4, Data analysis 4</td>
</tr>
<tr>
<td>Week 17</td>
<td>04/23-04/29</td>
<td>Teachers’ Interviews, Data analysis 5</td>
</tr>
</tbody>
</table>
In the CHI3242 course, students were required to complete four writing assignments in the spring semester of 2018. In this paragraph, I briefly summarize the texts and tasks used for the writing assignment, more detailed information about the four writing prompts are listed in the Appendix 4. The writing topics were related to Chinese traditional stories and current events. Students were required to hand-write an essay of at least 300 Chinese characters to express their opinions, to use complex and complete sentences, and to complete the essay in 60 minutes. In order to avoid the six student participants being unfamiliar with the writing topics or the writing genres, the four writing prompts were related to the reading materials in the textbook (see Appendix 4) and narrative-essay genres. The first writing prompt required student participants to watch a 30-minute movie scene about the marriage traditions of young people in a village in China. The movie revealed how parents, social status, financial issues, and other factors influenced the relationships among young people. After the student participants watched the movie scene, they were required to briefly summarize the scene, put forward their points of view, discuss their opinions and ideas, and provide examples to support their opinions. The second writing prompt required the student participants to read a story about an old man who moved a mountain in order to let his family go out of the village conveniently. Many people laughed at him because it was impossible to move a mountain, but the old man insisted on moving it. After the student participants read the story, they wrote an essay to briefly summarize the story, to discuss if they supported or opposed the old man’s behavior, to point out their own opinions and ideas, and to provide examples to support their choices. The third writing assignment was related to a Chinese idiom story Da Yu Zhishui (The Great Flood of Da Yu). The student participants
read a famous Chinese idiom story about a great flood that forced people to leave their homes to live on the high mounts. Da Yu led people to attempt to control the great flood. The student participants were required to write an essay to briefly introduce the story, illustrate their points of views toward the story, and provide examples to support their points of views. The fourth writing prompt was also related to a famous Chinese idiom story *Dao Ting Tu Shuo* (Word on the Street). The student participants were required to read the story about *Dao Ting Tu Shuo*: a young man heard something on the street, and he spread the rumor to others. When people doubted his words, he responded that he heard it through the grapevine. After reading the story, the student participants were required to write an essay to briefly introduce the story. Although the story happened in ancient China around 2000 years ago, people may encounter similar stories in modern society: the student participants were also required to write about their experiences and views related to the *Dao Ting Tu Shuo* and provide examples to support their opinions and ideas. The four writing prompts included the same requirements as follows:

1) Students write an essay to talk about your opinions, ideas, experiences, and to provide examples to support your opinions.

2) Students use complex and complete sentences.

3) At least 300 Chinese characters are required; student hand write their essay and complete it in 50 minutes.

4) Students follow the requirements of the rating criteria.

5) Students scan or take a picture of their handwriting assignment and submit it via the writing website.

6) Students submit their writing assignments before the deadline.

Students hand wrote the first drafts but typed the second drafts, because the research mainly
concentrated on exploring students’ revision effects in Chinese rather than Chinese orthographic abilities. In addition, hand-writing Chinese characters requires a lot of time; thus, the researcher only required students to hand write the first drafts while allowing them to type the second drafts.

**Error Coding Categories**

Students who were in CHI3242 received indirect, coded, computer-mediated WCF in a multiple-draft setting via an online writing website. Ferris (2006) developed 15 error categories and codes to provide coded WCF to L2 learners in the context of teaching English as a second language. Ferris discussed how these 15 error codes were developed, Ferris consulted 86 experienced ESL instructors, and they selected 15 error categories that could represent the typical errors made by students. In 2012, Ferris extended the 15 error codes to 20, which included the following, verb tense errors, verb phrase formation errors, word form errors, article errors, noun plural marker errors, subject and verb errors, preposition errors, word order errors, word errors, word choice errors, comma errors, spelling errors, apostrophe errors, sentence structure errors, missing words errors, pronoun reference errors, pronoun used errors, run-on sentence errors, comma splice errors, and sentence fragment errors. Ferris’s 20 error codes were widely used in providing coded WCF in teaching ESL/EFL; however, Ferris’s categories were not completely suited for TCFL. Several educators of Chinese adapted Ferris’s 20 error codes and revised them to be suitable in the context of TCFL, and many Chinese programs have applied these error codes in providing coded WCF to students (e.g., Chen, 2012; Jin, 2014).

Jin (2014) conducted research to explore error types made by learners of Chinese at an advanced level. The research findings indicated three main types of errors: lexical level errors, grammatical level errors, and syntax level errors. Lexical level errors included word substitution, incorrect chunks, incorrect idiom use, lack of better terms, and level inappropriate words as
follows (Translated word-for-word). The examples provided by Jin’s study (2014).

1) Word substitution (WS), e.g., *气力 “vigour”
   力量 “strength”

2) Incorrect chunks (IC), e.g. *先想设法 “first think, find method”
   想方设法 “think direction, find method”

3) Incorrect idiom use (II), e.g., *谈容易 “say easy”
   谈何容易 “say what easy”, which means not easy

4) Lack of better terms (LBT), e.g., *情况很糟糕 “situation very bad”
   很贫穷 “very poor”

5) Level inappropriate words (LIW), e.g., *很小的男孩 “very little boy”
   男婴 “male infant”

Grammatical errors consisted of verb object error, verb complement error, verb complement object error, SVO word order error, and missing grammatical components as follows. (Translated word-for-word)

1) Verb object (VO):
   e.g., *他的母亲也做外遇 “His mother also makes an extramarital affair”
   他的母亲也有外遇 “His mother also has an extramarital affair”

2) Verb complement (VC):
   e.g., *更容易地赢 “easier to win”
   更容易地打赢 “easier play to win”

3) Verb complement object (VCO):

84
e.g., *他们抱错 “They hold the wrong”

他们抱错孩子 “They hold the wrong baby”

4) SVO word order (SVO):

e.g., *她的头发黑色 “Her hair black”

她的头发是黑色的 “Her hair is black”

5) Missing grammatical components (MGC):

e.g., *他们说什么不承认 “They say what not admit”

他们说什么也不承认 “They say what (final particle of strong affirmation) not admit”

The syntax level errors included word order, sentence connector, and level inappropriate sentences as follows. (Translated word-for-word).

1) Word order (WO):

e.g., * 但是他们三年等待 “But they three years wait”

但是他们等待了三年 “But they wait three years”

2) Sentence connector (SC),

e.g., *虽然很努力，成绩不好 “Although very hard, results not good”

虽然很努力，但是成绩不好 “Although very hard, but result not good”

3) Level inappropriate sentences (LIS),

e.g., * 美国的领养美国孩子的政策 “U.S. adopt U.S. children policy”

关于领养美国孩子的政策 “Regarding to adopt U.S. children’s policy”

Jin’s error categories were summarized from learners of Chinese at an advanced level, such categories were not completely suited for learners of Chinese at an intermediate level.
Students at intermediate levels might not be familiar with using idioms and terms; thus, incorrect idiom use and lack of better terms were not included in the error types tracked in CHI3242 courses. Verb object and SVO word order were widely used in Chinese writing both at novice-level and intermediate-level (Chen, 2012; Jin, 2014). Verb complement and verb complement object have been taught in first-year and second-year Chinese classes; in intermediate-level Chinese writing, the researcher has not considered whether or not students use words/phrase/sentences at the appropriate level; thus, the researcher did not include LIW and LIS in the error types in CHI3242 courses. WS errors were only related to word choices: i.e., if the words were used appropriately. In WS error category, the Chinese character written errors (e.g., character stroke errors, wrong Chinese characters) were not included. Table 2 is the coded WCF chart for teaching Chinese in CHI3242 courses, which was used in teacher marking and in the analysis in this study. The Table 2 shows the coded WCF chart for TCFL.

**Table 2.** Coded WCF Chart for Teaching Chinese as a Foreign Language.

<table>
<thead>
<tr>
<th>Error type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word substitution (WS)</td>
<td>red circle</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td>blue circle</td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td>_______ black</td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td>_______ red</td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td>_______ blue</td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td>_______ green</td>
</tr>
<tr>
<td>Word order (WO)</td>
<td>green circle</td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td>ABC strikeout</td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>∨</td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td>_______ yellow</td>
</tr>
</tbody>
</table>

Many researchers have paid much attention, from many different perspectives, to Chinese
written error analysis. Many Chinese linguists discussed the errors through emphasizing word differences, distinguishing word usages, analyzing L1 transfers, and so forth (e.g., Chu, 1998; Jin, 2010). Some researchers focused on the Chinese L2 learners’ errors based on the perspective of Chinese pedagogy, summarizing students’ errors, identifying the categories in which students make the most frequent errors, and emphasizing how to effectively correct students’ errors, (e.g., Jin, 2010; Han, 2017; Xing, 2003, etc). Since this study aimed to explore the effects and students’ views of teachers’ indirect, coded, and computer-mediated WCF rather than discovering Chinese linguistic knowledge, the study mainly focused on the best way to categorize errors in terms of the research on TCFL. Xing (2003) analyzed 17,648 lexical-level errors made by learners of Chinese in Chinese language corpus system (a database storing writing by CFL students). His research summarized five main categories of errors on the lexical level: L2 learners produced new words, made inappropriate word substitutions, had missing/duplicated words, mixed up word order, and made other errors. In the current study, we applied word substitution, incorrect chunks, missing word, and word order on the lexical-level error categories. Jin (2010) pointed out that many grammatical errors originate in the combinations among words. Therefore, she suggested that teachers focus on the connections among words. She identified VO, VCO, SVO, and MGC error categories on the grammar level. In a Chinese teacher training program, Shepherd (2014) pointed out that one of the primary difficulties that learners of Chinese face lies in the transition from Chinese spoken language to Chinese written composition. Chinese teachers need to consider how to coach and instruct learners on the daunting transition from Chinese spoken language to Chinese written language. In the coded WCF chart, the study also included spoken language (SL) as an error category.

In order to verify the reliability of the error categories, the researcher did a pilot research
study to explore how online feedback affected third-year students’ acquisition in Chinese writing. In the pilot study (which I will discuss further in a following section), I used error categories to code the written errors. Counting and identifying the errors in their first drafts showed that the most common errors were word substitution, word order, missing word, and meaning not clear. The following pilot study section will discuss if the error categories were able to account for the errors. In order to increase the reliability of coding, the researcher clearly explained the WCF code categories and coded computer-mediated WCF procedures to students at the beginning of the semester and modeled the computer-mediated WCF procedures in the class. Additionally, teachers provided opportunities and enough time for students to ask questions in order to reinforce students’ understanding of the error categories. At the beginning of the semester, the researcher held a workshop to familiarize the teacher with the error categories.

**Pilot Study**

To ensure the quality of the data collection and data analysis, the researcher tested the data collection instruments and the data analysis procedures in a pilot study. The study explored students’ views to teachers’ online indirect WCF in Chinese writing in order to investigate how to provide effective online written feedback. The study was tried out on a group of people who were similar to the participants who eventually experienced the feedback process in the spring semester of 2018. The pilot study recruited twelve American Chinese learners from a Chinese program at a large public university in the southwestern part of China. The participants’ proficiency levels ranged from intermediate-mid to intermediate-high. In their Chinese writing class, students used the computer-mediated WCF website. Ten participants aimed to gain a B.A. degree in Chinese Languages and Literatures, and two participants aimed to improve reading and writing abilities to fulfill their current work needs. All the participants received an informed
consent form to allow the researcher to collect data from their writing assignments, to analyze data from their survey questionnaires, and to record their interviews. The data collection and analysis were anonymous in order to protect students’ privacy.

The researcher conducted the pilot study in an Intermediate Reading and Writing class for four weeks. In the first week, teachers assigned a topic to the participants. The twelve participants wrote a writing assignment in the class based on a prompt. In Monday’s class of the second week, the twelve participants discussed the topic based on their reading materials. In Tuesday’s class, the twelve participants wrote a writing assignment in the class based on the prompt. The twelve participants completed the writing assignment in 30 minutes in Tuesday’s class and then scanned the writing assignment and submitted it to teacher via the writing feedback website. In order to improve the reliability of the research setting, both the teacher and the researcher provided indirect coded feedback to students at night on Tuesday. The teacher allowed students to bring their personal laptops or Tablets to the classroom on Wednesday. Students were required to use their first-draft feedback to modify their essays on their digital devices during the class and send their second-drafts to the teacher. In the third week, all the participants completed a survey after the teacher had graded the second-drafts. After receiving students’ surveys, the researcher categorized several points that the researcher needed to further discuss with participants. In the fourth week, the researcher randomly selected three participants to engage in individual telephone interviews. The researcher conducted a 20-minute phone interview with each. The interview aimed to more deeply explore students’ reflections on using the web-based writing feedback system.

In the students’ writing, each student had several errors of the wrong characters’ type. Based on the errors’ numbers of first drafts and second drafts, the researcher could see that
students could correct the wrong characters. Most students correctly modified errors of the following types: WS and MW. However, the data showed that students failed to correctly modify the following three error types: WO, IC, and VCO. In sum, based on the data, the researcher could see that in this research setting, students could effectively correct errors of WS and MW; however, students failed to correctly modify errors of meaning not clear, 1st-language transfer, and word choice.

Based on the survey, while over half of the participants usually received feedback from teachers, 44.4% of participants identified teachers’ feedback as the most effective in helping them to improve their writing abilities. Some students reported that some peers whose Chinese proficiency level was higher than theirs could also provide effective feedback to help them improve writing abilities. Students mentioned that they gained feedback from peers, tutors, and Chinese friends. When participants were asked about their attitudes toward error corrections, the majority (80%) of responses indicated positive attitudes toward error corrections. 20% indicated that too many error corrections made them feel nervous and disappointed. When asked about the error feedback strategies they preferred, 60% opted for face-to-face oral feedback and discussion. 67% of participants indicated that they would check the error codes and find error categories. 34% of participants thought such a method of providing feedback had some drawbacks: they did not think they could correct the errors and they turned to ask their Chinese friends for help. All the participants agreed that there were certain kinds of errors that they did not know how to correct. They all indicated that they would look for support from either classmates or teachers.

The usability and accessibility of the writing feedback website also hindered students’ uptake in correcting errors. All participants pointed out that the biggest challenge they faced when using the writing feedback website was that it was not user-friendly. Participants also pointed out that
the writing feedback website had several benefits, such as making it easy to collect assignments, allowing them to review teachers’ feedback and track improvements, and giving them more time to respond to teachers’ feedback.

The pilot study randomly interviewed three participants. Three participants indicated that they trusted teachers’ language knowledge and teaching abilities. One of the participants mentioned that teacher’s native language was Chinese, and the teacher achieved a master’s degree in Chinese Languages and Literatures, so the participant thought the teachers’ feedback was the most accurate and effective. The three participants pointed out that teachers’ feedback was reliable and appropriate. A participant explained that the teacher had been teaching them for one year; therefore, the teacher knew what they need to learn and what they had learned. The three participants indicated that it was easy to modify these three types of error (WS, word strokes, and MW). They thought using the writing feedback website helped them to correct these errors. One of the participants highlighted that the website allowed them to zoom in on the Chinese characters, making it easier to find character errors. Since students were able to search for Chinese characters on websites or web-based dictionaries, they could modify wrong characters more easily than looking for a Chinese character in a paper-based dictionary. The three participants said that they would need more support to modify these types of errors. The participants acknowledged the difficulty of attempting to modify these types of errors by themselves. One participant thought that he needed to spend a lot of time searching for how to modify these types of errors; however, he wanted to learn quickly. Another participant indicated that the codes did not go into enough details for her to modify the errors by herself. All the participants pointed out that using the coded error feedback helped them to modify small errors; however, the coded error feedback was too broad and did not provide effective and specific
feedback to enable them to correct errors in word order, 1st-language transfer, and meaning not clear. The three participants pointed out that there were several benefits of using the writing feedback website. It was easier for them to submit the assignments and receive the feedback. All writing assignments were collected in their online account; access to the writing assignments was more flexible. One of the participants emphasized that she did not need to worry about arranging her paper-based writing assignments anymore; all the writing assignments were in her account, where she could review her writing assignments and teachers’ feedback. One of the participants mentioned that he could track his improvements. He thought the function of error statistics and analysis were helpful for him to track his errors and identify his improvements. However, all the participants thought the design of the writing feedback website was not user-friendly. They suggested that the web designers should pay more attention to the usability and accessibility of the website, and they complained that it took them a long time to figure out how to use the website. One of the participants indicated that the writing feedback website provide error codes chart; however, it was not easy to find, and the navigation was very confusing. Another participant expressed her need to receive teachers’ support in modifying errors; she suggested that it would be helpful if the website could provide video chat, audio chat, or instant messaging for students to communicate with teachers online.

Collecting and analyzing data from the pilot study provided valuable feedback to ensure that the survey questions and interview questions were reasonable and useful, the steps were clearly understandable, and the survey questions and interview questions were user-friendly. Responding to the feedback, the researcher made necessary adjustments to make sure that the survey questions, interview questions, error categories, and website were very well designed. Since several participants reflected that the design of the writing feedback website was not user-
friendly and that they could not find what the error codes meant, the researcher revised the navigation of the website, so that students could easily find the error code category chart on the first page. The researcher also added a link on the first page to allow students to download the error code category chart to their personal computer. In addition, the error code category chart was inserted into each writing assignment prompt. In the pilot study, the interview questions did not seek deeper understandings of and reasons for student responses. For example, some students indicated that the navigation was confusing, but the interview questions did not keep asking which part of the navigation made them feel confused. Therefore, the researcher revised several interview questions in order to collect sufficient responses. Regarding the error category chart, the error categories included wrong character, wrong strokes, WO, English transfer, MGC does not make sense, WS, unnecessary word, and MW. Based on the data, students revealed that four types of errors, including grammar mistakes, English transfer, does not make sense, and word order, were too broad and did not provide effective and specific feedback to enable them to correct errors. In terms of previous research on coded WCF, I revised the error code category chart, as shown in Table 2.

**A Background Questionnaire**

At the beginning of the study, participants were required to complete a background questionnaire meant to elicit information that could help researchers interpret the results and could be useful in discussions and implications. The questionnaire included six questions aiming to discover students’ background, history of learning Chinese, and motivations for learning Chinese. The questions included 1) What is your home/family language? 2) What age was you upon arrival in the U.S.? 3) How long have you learned Chinese? 4) What is your major? 5) What are your motivations for learning Chinese? And 6) Why are you taking CHI3242?
Surveys

After the participants submitted the first final draft, they took a short survey. Students completed the survey four times, once for each essay. The survey questions included eight questions that fit into three major categories. The first category aimed to know students’ perspectives on WCF while the second category aimed to investigate student views on computer-mediated coded WCF and the online writing feedback system, and the third category aimed to explore participants’ views on the technology design of the website. The survey questions are included in the appendices (See Appendix 6). Regarding the first category, the researcher asked participants “how easy is it to understand the error codes?” and “how do you feel about coded error corrections?” The second category included “how do you feel about the computer-mediated coded WCF?” and “how easy is it to understand how to use the online writing feedback system?” The third category involved questions about the interface, navigation, and functions on the CMS website. The survey questions were the same in each of the four surveys. The researcher asked student participants to select at least one answer from the following options: 1) extremely helpful, 2) very helpful, 3) somewhat helpful, 4) not so helpful, and 5) not at all helpful. The researcher also encouraged student participants to explain the reasons for their choices in the following interviews. Based on the survey answers, the researcher could further discuss a student’s reasons with him or her in the interview. Based on the four surveys, the researcher could see the changes of student participants’ views during the whole semester.

Interview Questions

The participants completed four interviews, one after each second draft. Interviews were conducted by the researcher. Most interviews took about 20 minutes. Time slots for the interviews were negotiated and the researcher kept it flexible for the participants. At each
interview, participants were asked the same interview questions (see Appendix 5). The researcher asked the interview questions in English. Some student participants considered the interviews as opportunities to practice their Chinese speaking and listening. In addition, the Chinese program required students to only speak Chinese to their teachers in the Chinese classes and encouraged students to actively speak Chinese with Chinese native speakers; thus, some of student participants answered the interview questions in Chinese. The researcher transcribed their answers and translated them into English.

The interview questions aimed to gain a deeper understanding of the factors that influence students’ incorporation of teacher feedback in their writing and of third-year student participants’ views of the indirect and coded WCF and the computer-mediated WCF CMS. The interview questions were designed to elicit the following information from the student participants: 1) views and attitudes toward WCF, 2) insights into why student participants failed to correct certain errors, 3) instructional design of the CMS website, and 4) suggestions after using the online coded WCF.

The first category of interview questions included the following: “what kind of feedback was the most effective in helping you to improve your writing abilities?”, “how long did it take to correct the errors on your 1st-draft assignment?” and “do you think the time you spent correcting errors was worthwhile?” The second category included the following questions: “what do you usually do when you receive your 1st-draft feedback?”, “which kinds of errors are difficult to correct?” and “are there any kinds of errors that you do not know how to correct?” The third set of questions asked, “what challenges did you meet when using the online feedback system?” and “what do you think are the advantages of the online feedback system?” The fourth set included the following: “which kinds of error feedback do you think are the most helpful and
effective after using the computer-mediated WCF?” and “what other forms of feedback would you want to add to the online writing feedback system?”

The teacher participant completed one interview at the end of the semester. During the interview, the teacher participant was asked some interview questions, which are included in the appendices (see Appendix 5). The interview questions were designed in four categories. The first category aimed to investigate the teacher’s view on coded WCF in multiple-draft writings. The second category aimed to explore how the teacher viewed student participants’ corrections. The third category aimed to discover the teacher’s views on the online WCF from the perspective of instructional technology. The fourth category aimed to elicit the teacher’s suggestions on the online multiple-draft WCF CMS. The interview questions of the first category included the following: “which types of feedback do you think are the most helpful and effective to help learners to improve Chinese writing abilities?” and “do you think the time you spend providing feedback is worthwhile?” The second category included the following: “how long does it usually take to provide feedback on students’ writing assignments?”, “do you think students read and use your feedback to modify their assignments?”, “what types of errors do students fail to correct?”, “do students repeatedly make certain mistakes in their writing assignments during the whole semester?”, and “did students ask you to provide other forms of feedback for their writing assignments?” The third category of questions asked, “what are your perceptions of indirect, coded, computer-mediated feedback?” and “what are the advantages of the online writing feedback system?” The fourth category asked, “what other suggestions do you have for improving the online feedback system to provide more effective feedback on students’ Chinese writing?” and “do you think other forms of feedback such as oral feedback or peer feedback could help learners improve their writing abilities?” The researcher asked the interview questions
in English. The teacher answered in Chinese, and the researcher translated the answers into English. The interview took one hour. The teacher’s responses discussed the six student participants and all of their writing assignments, revealing some common trends and differences among the six student participants. Thus, the researcher analyzed the teacher’s interview in the cross-case analysis section. Figure 6 displays data collection procedures.

**Figure 6.** Flowchart for research procedure.
Data Analysis Method

Analysis of Each Source and Trustworthiness

This section first briefly discusses the within-case analysis and the cross-case analysis. The within-case analysis aimed to describe the results of the six single cases in detail and attempted to reveal some research findings. Each student participant was viewed as a unit of analysis. Each single case included the student participant’s learning background, the characteristics of the four writing revisions, the characteristics of the four first-drafts of the four writing assignments, and the patterns, trends, and individual differences based on the four surveys and the four interviews. The cross-case analysis aimed to find patterns and trends among the six student participants. Khan and VanWynsberghe (2008) discussed the advantages of “case-oriented approaches” in cross-case analysis: “This approach can show how a story unfolded in different cases, how researchers can make sense of the original case, or suggest new typologies, classes or families of a social phenomenon” (Khan & VanWynsberghe, 2008, p. 10). The cross-case analysis viewed the six student participants as one unit of analysis.

One of the most important sources of case study evidence is the survey. There are two types of surveys: one type of survey could be designed as part of an embedded case study, while another type of survey could be designed to report quantitative data as part of the case study evidence (Yin, 2013, p. 155). In the current research study, the survey was applied to investigate participants’ views on indirect, coded, computer-mediated WCF; therefore, the survey was designed to report data as part of the case study evidence. The survey using the closed-form could provide descriptive data for the researchers to easily record and analyze students’ general views of using indirect, coded, computer-mediated WCF. Based on analysis of the survey results, the researcher could have interviews with participants to explore their deeper views, attitudes,
feelings, experiences, and so forth. The researcher uploaded the survey questions to www.surveymonkey.com or printed the survey questions and sent the survey to all participants.

**Analyses of Survey Data**

The survey was designed for answering the third research question: how do third-year Chinese students and their teachers view the indirect and coded WCF and the computer-mediated WCF CMS? To analyze the survey data in the within-case analysis, the unit of analysis was each student participant’s four surveys. For example, when analyzing Ben’s case, the researcher examined Ben’s answers on the four surveys. This analysis aimed to present trends in how each student viewed the indirect and coded WCF and the computer-mediated WCF CMS. The researcher identified each student’s trends and changes in attitude toward the online coded WCF based on the four surveys. When analyzing the data, the researcher considered what trends or changes emerged from each participant’s four surveys.

In the cross-case analysis, the researcher analyzed the data based on three aspects: guided by the research questions, 1) participants’ attitudes toward computer-mediated WCF, 2) participants’ views of the CMS and technology functions, and 3) participants’ views of multiple-draft Chinese writing. The researcher created three tables: the first table listed the six participants’ answers about their attitudes toward computer-mediated WCF, the second table listed the six participants’ responses regarding their views of the CMS and technology functions, and the third table showed the six participants’ answers regarding their views of multiple-draft Chinese writing. Based on the tables, the researcher identified the cross-case patterns and trends in how third-year Chinese students viewed the indirect and coded WCF and the computer-mediated WCF CMS.
Analyses of Interview Data

In his book, Yin (2013) emphasized the essential role that interviews play in case study research given that “most case studies are about human affairs or actions, and a well-informed interviewee can provide deeper insights and views into such human affairs or actions” (Yin, 2013, p.155). To analyze interview data, the researcher focused directly on exploring research question three and research question four, with students and the teacher providing important explanations as well as personal views, perceptions, attitudes, and meanings.

Seliger and Shohamy (1989) identified two major strategies in analyzing qualitative data: “deriving a set of categories for dealing with text segments from the text itself” and ensuring that “an ordering system of categories already exists at the beginning of the process and the research applies this system to the data” (p. 205). Yin (2013) said that one of the most important techniques for case study analysis is pattern matching. The study used broad thematic description across an entire data set to identify patterns. When analyzing the data, the researcher asked whether a pattern of response showed up through an interview and whether a pattern of response showed up across multiple participants’ interviews. In analyzing the collected data, the researcher transcribed the interviews and translated parts of the interviews. In addition, in terms of deriving themes, the researcher used within-case analysis to present several single cases in order to illustrate participants’ individual views, attitudes, trends, and characteristics. The researcher carefully reviewed the transcripts about the types of responses of the participants. The pattern categories were based on the students and teachers’ responses from the interviews, and the researcher identified different categories of responses derived from the collected data. The researcher analyzed the categories in order to collapse and combine certain categories of responses. Based on the combined and collapsed categories of responses, the researcher analyzed
the patterns/themes to discover research findings.

Analyzing interview data might pose some challenges: researchers might “encounter bias due to poorly articulated questions, response bias, inaccuracies due to poor recall, or the interviewee saying what the interviewer wants to hear” (Yin, 2013, p.148). In order to maintain the credibility of the data result, the researcher carefully assessed credibility, dependability, and confirmability (Krefting, 1991, p.217) during the survey and the interview process. The researchers urged students to discuss their own true personal views and reassured students that their responses would not influence their grades. The interviewer restated the importance of information accuracy to the participants. In the process of data analysis, the researcher also paid attention to any biased responses and inaccurate information. For example, the researcher highlighted that the surveys and interviews would not influence their scores, and the researcher asked student participants to respond with honest answers. The researcher reconsidered if information was biased or inaccurate. The researcher coded the data, and after two weeks, the researcher recoded the data; around 90% of the coding matched.

After the data analysis, the researcher applied the technique suggested by Seliger and Shohamy (1989) to assess the reliability of the results:

“To examine the reliability of the data, the tapes were given to other researchers who went through the same steps and obtained their own categories of types of reactions. These categories were then compared with those of the first researcher. The patterns on which two researchers agreed were considered valid in this context” (p.207).

In the current study, as there was no co-researcher during data analysis, the researcher did a peer examination based on the above technique. The peer examiner was a colleague who was familiar with the qualitative research method, interview data analysis, Chinese pedagogy, and
second language acquisition. The researcher sent the within-case data analysis and the cross-case data analysis to the colleague, the colleague examined the data analysis and then confirmed the agreements of the results of the data analysis.

**To Answer RQ 1**

RQ1: How do students respond to the teachers’ indirect, coded, and computer-mediated WCF in their writing?

To calculate what types of errors third-year Chinese students could/failed to correct when they revised based on the indirect, coded, and computer-mediated WCF, two independent raters used the following charts, as shown in Table 3 and Table 4.
Table 3. A List of Students’ Revisions on Each Essay.

<table>
<thead>
<tr>
<th>No.</th>
<th>Errors</th>
<th>Revised</th>
<th>Error Types</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
Table 4. Calculating Errors for Each Writing Assignment.

<table>
<thead>
<tr>
<th>Rater’s name</th>
<th>Student’s name</th>
<th>Writing#</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># 1st-draft errors</th>
<th># 2nd-draft errors</th>
<th>% corrected</th>
<th>notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word substitution (WS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word order (WO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New errors Only for 2nd-draft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3 and Table 4 provided a general idea of what types of errors students could/failed to correct. However, Table 3 and Table 4 could not help us understand what types of errors students ignored and what types of errors students attempted to correct. To deeply assess what types of errors students could/failed to correct on their revised drafts, two independent raters applied Ferris's (1997) Rating Scale for Revision to grade students’ revisions, as shown in Table 5. Ferris (1997) developed the scale to consider the “degree to which the student utilized each first-draft comment in the revision” (p.320). Ferris (1997) conducted the research to explore whether revisions influenced by teacher feedback led to effective changes in students’ papers. The study examined 1,600 marginal and end comments written on 110 first drafts of papers. The participants included 47 advanced university ESL students. Ferris developed a subjective rating scale to assess the impact of the teacher’s commentary on the students’ revised drafts. Four raters participated in data analysis, with the result revealing that interrater reliabilities were around .82 as a result of some disagreements over what constituted a minimal change versus a substantive change. In the current study, the researcher revised Ferris’s (1997) rating scale for revisions by deleting minimal change and substantive change, as shown in Table 6. Based on the revised rating scale, the study aimed to reveal the types of errors for which indirect, coded, and computer-mediated WCF method would not be effective to provide effective feedback. In other words, does indirect, coded, and computer-mediated WCF lead to positive and effective changes in students’ papers? Table 5 shows Ferris rating scale for revisions, and Table 6 shows the revised rating scale for revisions.
Table 5. Ferris Rating Scale for Revisions.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No discernible change made by student in response to this coded CF</td>
</tr>
<tr>
<td>2</td>
<td>Minimal attempt by student to address the coded CF, effect generally negative or negligible</td>
</tr>
<tr>
<td>3</td>
<td>Substantive change(s) made by student in response to coded CF, effect generally negative or negligible</td>
</tr>
<tr>
<td>4</td>
<td>Minimal attempt by student to address the coded CF, effect mixed</td>
</tr>
<tr>
<td>5</td>
<td>Substantive change(s) made by student in response to coded CF, effect mixed</td>
</tr>
<tr>
<td>6</td>
<td>Minimal attempt by student to address the coded CF, effect generally positive</td>
</tr>
<tr>
<td>7</td>
<td>Substantive change(s) made by student in response to coded CF, effect generally positive</td>
</tr>
</tbody>
</table>

Table 6. Revised Rating Scale for Revisions.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No change: No discernible change made by student in response to this feedback.</td>
</tr>
<tr>
<td>1</td>
<td>Change/effect negative: Attempt by student in response to the feedback, effect generally negative or negligible.</td>
</tr>
<tr>
<td>2</td>
<td>Change/effect mixed: Attempt by student in response to feedback, effect mixed.</td>
</tr>
<tr>
<td></td>
<td>Minimal attempt by student to address the coded CF, effect mixed.</td>
</tr>
<tr>
<td>3</td>
<td>Change/effect positive: Attempt by student in response to feedback, effect generally positive.</td>
</tr>
</tbody>
</table>

In order to assess the reliability of the study, the study had two independent raters. After student participants had revised their first drafts and submitted the second drafts on the website, one independent rater graded the revised drafts based on the rating scale for revisions. Another independent rater graded ten revised drafts based on the rating scale for
revisions. The researchers compared the two independent raters’ rating scale for revisions and calculated the reliability ratio. Each rater completed the revision rating form, as shown in Table 7. Here are some examples from the study:

Revision rating: 0 (no change)

Example 1:

*Excerpt from Rachel’s first writing assignment:*

孩子和父母之间有很多差别是正确的。

“It is correct that there are many differences between children and parents.”

*Teacher’s feedback:*

Word Substitution (WS) code on 正确 [correct]

*Excerpt from Rachel’s revision:*

孩子和父母之间有很多差别是正确的。

“It is correct that there are many differences between children and parents.”

In example 1, the teacher used a code to point out the Word Substitution (WS) error 正确 [correct], the correct form should be 可以理解的 [it is understandable] or 正常 [normal]. In student’s revision, the student did not change the error.

Example 2:

*Excerpt from Ben’s first writing assignment:*

我想达到我的目标但是我的朋友不相信。

“I want to achieve my goal but my friends do not believe”

*Teacher’s feedback:*

Missing grammatical components (MSC) code between 目标 [goal] and 但是 [but].

*Excerpt from Ben’s revision:*

我想达到我的目标但是我的朋友不相信。
“I want to achieve my goals but my friends do not believe”

In example 2, the teacher used a code to point out the missing grammatical component, a comma, between 目标 [goal] and 但是 [but], but the student ignored the error in the revised version. The correct form should be 我想达到我的目标，但是我的朋友不相信 [I want to achieve my goal, but my friend do not believe].

Revision rating: 1 (change; effect negative)

Example 3:

Excerpt from Ben’s second writing assignment:

不会达到他们自己的理想。

“Will not reach their own ideal”

Teacher’s feedback:

Incorrect Chunks (IC) on “达到他们自己的理想” [reach their own ideal]

Excerpt from Ben’s revision:

不会达到他们的理想。

“Will not reach their ideal.”

In example 3, the teacher used a code to point out the Incorrect Chunks error on “达到他们自己的理想” [reach their own ideal]. The correct form should be “实现他们自己的理想” [achieve their own ideal]. The student noticed the error code and attempted to correct the error; however, the revised sentence was still incorrect. Thus, the student made change but the effect was negative.

Example 4

Excerpt from Mary’s first writing assignment:

妻子责任是照顾丈夫的家人。

“Wife responsibility is taking care of husband’s family”. 
Teacher’s feedback:

Missing word (MW) code between 妻子 [wife] and 责任 [responsibility].

Excerpt from Mary’s revision:

妻子责任丈夫的家人。

“Wife responsible husband’s family”.

In example 4, the teacher used a MW code to point out the Missing Word error between 妻子 [wife] and 责任 [responsibility]. Based on the context, the correct form should be “妻子的责任是照顾丈夫的家人” [Wife’s responsibility is taking care of husband’s family]. The student noticed the error code and attempted to correct the error; however, the sentence was still incorrect in the revised version. In the researcher’s view, Mary made changes, but the effect was negative.

Revision rating: 2 (change; mixed effect)

Example 5:

Excerpt from Martha’s second writing assignment:

我干什么事都恒心的。

“I do everything persevering”

Teacher’s feedback:

Incorrect Chunks error (IC) on “都恒心的” [persevering].

Excerpt from Martha’s revision:

我干什么事都是恒心的。

“I do everything is persevering”.

In example 5, the teachers used a IC code to point out the Incorrect Chunk on “都恒心的” [persevering]. The sentence lacks a phrase 是有 [is having] between “都” [entirely] and “恒心” [perseverance]. The correct form should be “我干什么事都是有恒心的” [I do
everything entirely is having perseverance]. Martha noticed that she needed to add a “是” [is] here; however, Mary missed the word “有” [have]. The student realized the error and attempted to correct the error, but the effect is mixed, half positive and half negative.

Example 6:

Excerpt from Daniel’s second draft:

中国很往往地发洪水。

“China very often floods”.

Teacher’s feedback:

Incorrect Chunks error (IC) on 很往往地 [very often]

Excerpt from Daniel’s revision:

中国非常经常地发洪水。

“China very often floods”.

In example 6, the teacher used a IC code to point out the Incorrect Chunk error in “很往往地” [very often]; based on the context, the correct form was “中国经常发洪水” [Chinese often floods]. Daniel noticed the error and corrected the error: Daniel corrected the wrong word “往往” [often] to the correct form “经常” [often], however, “非常经常” [very often] was not a correct form. Thus, we considered this attempt as half negative and half positive.

Revision rating: 3 (change; effect positive)

Example 7:

Excerpt from Paul’s third writing assignment:

然后他回答说他自己不要移开。

“Then he responded that he did not want to remove (the mountain) by himself”.

Teacher’s feedback:
Word Substitution (WS) error on “不要” [did not want].

Excerpt from Paul’s revision:

然后他回答说他自己不能移开。

“Then he responded that he could not remove (the mountain) by himself”.

In example 7, the teacher used a WS code to point out the Word Substitution (WS) error on “不要” [did not want], and the student revised the error correctly in the revised version. Thus, we considered it a change with positive effect.

Example 8:

Excerpt from Daniel’s third writing assignment:

就让两大力神把这两座山移开。

“Let the two Great Gods remove the two mountains”.

Teacher’s feedback:

Missing Word (MW) error between 两 [two] and 大力神 [Great Gods]

Excerpt from Daniel’s revision:

就让两位大力神把这两座山移开。

“Let the two (measure word) Great Gods remove the two mountains”.

In example 8, the teacher used MW error code to point out the Missing Word error between 两 [two] and 大力神 [Great Gods]. The phrase “两大力神” [Two Great Gods] lacked a measure word: the correct form should be “就让两位大力神把这两座山移开” [Let the two (measure word) Great Gods remove the two mountains]. The student revised the error correctly; thus, we considered this a change with positive effect. Table 7 shows the revision rating form.
Table 7. Revision Rating Form.

<table>
<thead>
<tr>
<th>Error types</th>
<th>No change</th>
<th>Change, Effect negative</th>
<th>Change, Effect mixed</th>
<th>Change, Effect positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Word substitution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect chunks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentence connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong preposition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this phase of data analysis, the revision rating form showed the frequencies and percentages of the various student responses to WCF. Using the revision rating form, the researcher tracked the characteristics of revisions. For example, if a student had an error in word substitution and the student corrected it successfully, the rater would input 3 in the cell of word substitution and change/effect positive. If the student successfully corrected five errors in word substitution in the whole paper, the rater would input 5 into the cell of word substitution and change/effect positive. Based on the revision rating scale, a change/effect positive is 3-point. The rater would also input 15-points (3-point * 5) into the cell of word substitution and change/effect positive. When all data had been input, the rater would calculate the total revision scores.

After four writing assignments, the researcher calculated the frequencies and percentages of each error type over all four essays, as shown in Table 8. Then, since students had four writing assignments, raters filled up four revision rating forms for each student. The researcher combined the four forms into one form and computed the percentage of each error type revision (for example, 22% of all errors were in word substitution with positive change effect); thus, errors types that students failed to correct were clearly revealed on Table 9. This data helped us to understand how students respond differently to different error types. Table 8 shows the form for calculating frequencies and percentages of each error types in the four writing assignments. Table 9 shows the form for the summary of revision rating forms for each student in the four writing assignments.
Table 8. Frequencies and Percentages of Each Error Type (Four Essays).

<table>
<thead>
<tr>
<th>Error types</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word substitution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect chunks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentence connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong preposition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. Summary of Revision Rating Forms for Each Student (Four Essays).

<table>
<thead>
<tr>
<th>Error types</th>
<th>1-st essay score</th>
<th>2nd-essay score</th>
<th>3rd-essay score</th>
<th>4th-essay score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Word substitution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect chunks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentence connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong preposition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To Answer RQ 2

RQ2: What evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester?

RQ2 aimed to explore the evidence of acquisition in Chinese writing accuracy in the changes in errors over the course of the semester. The researcher wanted to know whether students could correct errors based on the indirect, coded, computer-mediated WCF and transfer what was learned to new tasks. To answer RQ2, the researcher tracked whether certain types of errors were reduced or whether they disappeared altogether (see Table 8). The
researcher also compared differences among students’ four-essay revision rating scores, in order to quantify acquisition in terms of correcting errors over the course of the semester. Based on students’ four writing assignments, the researcher selected cases which might represent students’ evidence of acquisition in Chinese writing accuracy in the changes in errors over the course of the semester. For instance, the researcher compared and analyzed a participant’s errors types in writing assignment 1, writing assignment 2, writing assignment 3, and writing assignment 4; if certain error types were reduced or had disappeared in writing assignment 4, it might provide evidence that the student was able to notice the errors and avoided making such errors: i.e. that the student could transfer what was learned to new tasks.

To Answer RQ 3

RQ3: How do third-year Chinese students and their teachers view the indirect and coded WCF and the computer-mediate WCF CMS?

To answer RQ3, the researcher applied surveys to gather the reasons and student responses, and the researcher also used interview data to support and explain student responses. The survey data analysis procedure followed the following steps:

1) Analysis began after the first survey and was continued throughout the data collection process.

2) The researcher used the within-case analysis to present trends in how each student viewed the indirect and coded WCF and the computer-mediate WCF CMS.

3) The researcher used the cross-case analysis to reveal the patterns, themes, similarities, and differences in how third-year Chinese students viewed the indirect and coded WCF and the computer-mediated WCF CMS.

To Answer RQ 4

RQ4: What factor influence students’ incorporation of teacher feedback in their writing?
To answer RQ4, the research applied interviews to gather the reasons, student responses, and teacher responses. The data analysis procedure followed the following steps:

1) Analysis began after the first interview and was continued throughout the data collection process.

2) The interviews with the teacher and students were audiotaped and transcribed for analysis.

3) The researcher read and re-read the transcripts.

4) The researcher used the within-case analysis to illustrate the characteristics of certain single cases.

5) The researchers used the cross-case analysis and found the categories and patterns that reflected the data line-by-line.

6) The researchers tried to categorize the patterns and sort them into themes.

7) The researcher identified the categories of student responses and teacher responses.

8) Researchers compared categories, looking for negative responses, positive responses, and so forth.

9) Researchers tried to find the connections and trends among themes.

10) The researcher determined if there was sufficient evidence to support the themes.

11) The researcher interpreted a broader meaning and significance of each theme.

After the first-round of writing assignments (student participants completed the first-draft of the writing assignment, the teacher and the grader provided WCF, student participants completed the second-draft of the writing assignment, and student participants completed the first interview), the researcher considered if the CMS instructional design could be a factor leading student participant to fail to correct the errors. The researcher also thought about student participants’ and their teacher’s preferences for the type of WCF and computer-mediated WCF CMS from an instructional technology design perspective. Therefore, the
researcher added an instructional technology design evaluation to this study. The study applied Use Effect assessment criteria to evaluate the CMS. The Use Effect assessment included four categories: accessibility, identity, navigation, and content, including a total of 25 questions (adapted from Accessibility Developer Tools by Google Accessibility). For each question, the evaluator used 1-3 to score, 3 means no need to change, 2 means acceptable but need minor modifications, and 1 represents the need for major modifications. This evaluation standard was first applied to evaluate commercial websites (Panadero and Jonsson, 2013).

The researcher invited a professional instructional technology designer to provide assessment. The course designer made appropriate modifications so that the WCF system could go well with the online courses in the CMS. The evaluation questions were included in Table 10.

Table 10. Use Effect Assessment.

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Site load-time is reasonable</td>
<td></td>
</tr>
<tr>
<td>2. Adequate text-to background contrast</td>
<td></td>
</tr>
<tr>
<td>3. Font size/spacing is easy to read</td>
<td></td>
</tr>
<tr>
<td>4. Flash &amp; add-ons are used sparingly</td>
<td></td>
</tr>
<tr>
<td>5. Images have appropriate ATL tags</td>
<td></td>
</tr>
<tr>
<td>6. Site has custom not-found/404 page</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Course logo/number/name is prominently placed</td>
<td></td>
</tr>
<tr>
<td>8. Tagline makes course’s purpose clear</td>
<td></td>
</tr>
<tr>
<td>9. Home-page is digestible in 5 seconds</td>
<td></td>
</tr>
<tr>
<td>10. Clear path to course information</td>
<td></td>
</tr>
</tbody>
</table>
### Table 10 (Continued)

<table>
<thead>
<tr>
<th>Identity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Clear path to contact information</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Main navigation is easily identifiable</td>
<td></td>
</tr>
<tr>
<td>13. Navigation labels are clear and concise</td>
<td></td>
</tr>
<tr>
<td>14. Number of buttons/links is reasonable</td>
<td></td>
</tr>
<tr>
<td>15. Course logo/number/name is linked to home-page</td>
<td></td>
</tr>
<tr>
<td>16. Links are consistent and easy to identify</td>
<td></td>
</tr>
<tr>
<td>17. Site search is easy to access</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Major headings are clear and descriptive</td>
<td></td>
</tr>
<tr>
<td>19. Critical content is above the “fold”</td>
<td></td>
</tr>
<tr>
<td>20. Styles and colors are consistent</td>
<td></td>
</tr>
<tr>
<td>21. Emphasis (bold, etc.) is used sparingly</td>
<td></td>
</tr>
<tr>
<td>22. Ads and pop-ups are unobtrusive</td>
<td></td>
</tr>
<tr>
<td>23. Main copy is concise and explanatory</td>
<td></td>
</tr>
<tr>
<td>24. URLs are meaningful and user-friendly</td>
<td></td>
</tr>
<tr>
<td>25. HTML page titles are explanatory</td>
<td></td>
</tr>
</tbody>
</table>

### An Overview of RQs, Data Sources, and Data Analysis

The Table 11 provided an overview of research question, data sources, and data analysis.
Table 11. An Overview of Research Questions, Data Sources, and Data Analysis.

<table>
<thead>
<tr>
<th>RQ</th>
<th>Research Question</th>
<th>Data Source</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How do students respond to the teachers’ indirect, coded, and computer-mediated WCF in their writing?</td>
<td>Calculating errors for each writing assignment; rating scale for revisions; revision rating form. Used interview data to support.</td>
<td>Calculated what types of errors students could/failed to correct; two independent raters graded the revised drafts based on the rating scale for revisions; tracked the characteristics of revisions. Within case analysis and Cross-case analysis.</td>
</tr>
<tr>
<td></td>
<td>1.1) In the first round of computer-mediated WCF, what types of errors do third-year Chinese students correct when they modify their first drafts?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2) In the first round of computer-mediated WCF, what types of errors do third-year Chinese students fail to correct when they modify their first drafts?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>What evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester?</td>
<td>Tracked whether certain types of errors were reduced or whether they disappeared altogether in order to provide evidence of acquisition in terms of errors over the course of the semester.</td>
<td>The researcher compared and analyzed a participant’s errors types in writing assignment 1, writing assignment 2, writing assignment 3, and writing assignment 4. Within case analysis and Cross-case analysis.</td>
</tr>
<tr>
<td>3</td>
<td>What factors influence students’ incorporation of teacher feedback in their writing?</td>
<td>Survey. Used some interview data to support.</td>
<td>Within case analysis and cross-case analysis.</td>
</tr>
</tbody>
</table>
Table 11 (Continued)

<table>
<thead>
<tr>
<th>RQ</th>
<th>How do third-year Chinese students and their teachers view the indirect and coded WCF and the computer-mediate WCF CMS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Data Source:</strong> Interviews.</td>
</tr>
<tr>
<td></td>
<td><strong>Data Analysis:</strong> Within case analysis and cross-case analysis. When analyzing the data, the researcher asked whether a pattern of response showed up through an interview and whether a pattern of response showed up across multiple participants’ interviews.</td>
</tr>
</tbody>
</table>

By answering such questions, the study provided insight into the advantages and disadvantages of using a CMS to provide indirect, coded, and computer-mediated WCF. In addition, the study shed some light on the types of errors for which indirect, coded, and computer-mediated WCF offers little or no value to help students do self-revisions in CMS settings. The background questionnaire, surveys, and interviews with students and teachers revealed the drawbacks of instructions of the type of WCF on the CMS. Based on the research findings, the study aims to provide suggestions on how to provide effective computer-mediated WCF and how to design web-based writing classes and to further develop the functions of the computer-mediated WCF CMS to fulfill the learners’ and teachers’ needs and requirements.
CHAPTER FOUR:
RESULTS OF WITHIN-CASE ANALYSIS

In this chapter, the researcher describes the results of within-case analysis in detail and attempts to reveal some research findings. The section of the within-case analysis consists of the six single cases. In addition to these individual cases, Chapter five contains an additional section covering the cross-case analysis and results. The within-case analysis aimed to explore each single case in-depth as a stand-alone unit of analysis. The within-case section compared and contrasted the six single cases in order to perceive the trends, patterns, and individual differences that were divulged in those cases. Each single case included the student participant’s learning background, the characteristics of the four first-drafts of the four writing assignments, the characteristics of the revisions of the four writing assignments, and the patterns, trends, and individual differences based on the surveys and the interviews. This chapter presents six within-case analysis sections in the following paragraphs: Ben, Mary, Paul, Daniel, Martha, and Rachel.

For the within-case analysis, each student participant is a research analysis unit. The researcher used student participants’ revision scores to discuss the first research question. The researcher used the characteristics and distribution of errors in the first-draft and the four writing assignments to discuss the second research question. The researcher used the survey data to discuss the third research question, and the researcher used the interview data to discuss the fourth question. In order to maintain anonymity and confidentiality, the names of participants were replaced with pseudonyms. Table 12 provides a brief summary of the structure of the within-case analysis.
Table 12. A Brief Summary of the Structure of the Within-Case Analysis.

<table>
<thead>
<tr>
<th></th>
<th>RQ1: How do students respond to the teachers’ indirect, coded, and computer-mediated WCF in their writing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ben</td>
<td>Data sources: participant’s revision scores.</td>
</tr>
<tr>
<td>3. Paul</td>
<td>After discussing the participant's first writing assignment, the researcher continued to discuss the participant's second, third and fourth writing assignments.</td>
</tr>
<tr>
<td>5. Martha</td>
<td></td>
</tr>
<tr>
<td>6. Rachel</td>
<td></td>
</tr>
</tbody>
</table>

**Ben**

Ben was a senior undergraduate student majoring in International Relationships. He had been learning Chinese for two and a half years. He had passed first-year Chinese courses, second-year Chinese courses, and a third-year Chinese course at the beginning of the spring semester of 2018. Ben participated in an immersive study-abroad summer intensive program in China. He enrolled in Chinese courses for three years because his major had a second language requirement and because he was interested in international relationships, especially relationships between the U.S. and the East Asian countries. He told the researcher that he
was applying for a graduate program in East Asian Studies in a private university; therefore, he was interested in taking intermediate-level or advanced-level Chinese courses and he would like to devote more time to learning Chinese. Ben’s Chinese language proficiency level was intermediate-mid in terms of ACTFL proficiency guidelines.

**Ben’s Revision Scores**

Table 13 shows Ben’s revision scores.

**Table 13. Ben’s Revision Rating Form.**

<table>
<thead>
<tr>
<th>Ben.</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>WO<em>1; MW</em>1; MGC*1</td>
<td>IC<em>3; WO</em>1</td>
<td>MGC*2</td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>IC<em>2; WS</em>4; MW*1;</td>
<td>WS<em>1; WO</em>1</td>
<td></td>
<td>WS*1</td>
</tr>
<tr>
<td>Effect negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>IC<em>1; WS</em>1</td>
<td>WS<em>1 IC</em>1;</td>
<td>WS<em>1 IC</em>1;</td>
<td>IC<em>2 VCO</em>1</td>
</tr>
<tr>
<td>Effect mixed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>IC<em>1; MGC</em>1; MW<em>3; MGC</em>2</td>
<td>WS<em>3; IC</em>1; MW<em>3; MGC</em>1</td>
<td>WS<em>4; IC</em>1; MGC*1</td>
<td>WS<em>2 MW</em>2 MGC*1</td>
</tr>
<tr>
<td>Effect positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>15</td>
<td>29</td>
<td>36</td>
<td>22</td>
</tr>
<tr>
<td>% score</td>
<td>38/100</td>
<td>70/100</td>
<td>86/100</td>
<td>81/100</td>
</tr>
</tbody>
</table>

Notes: WS=word substitution, IC=incorrect chunks, VO=verb object, VCO=verb complement object, SVO=subject verb object order, MGC=missing grammatical components, WO=word order, SC=sentence connector, MW=missing word, WP=wrong preposition, SL=spoken language.
At the beginning, based on Ben’s first revision, the researcher provided an example to explain how the scores were calculated. There were three “no change errors” (3*0 = 0), seven “change with negative effect errors” (7*1 = 7), one “change with mixed effect errors” (1*2 = 2), and two “change with positive effect errors” (2*3 = 6). Ben’s first revision score was 0+7+2+6 = 15. However, we must put this number into context by comparing it to a totally successful revision. Ben’s total number of errors was 13; therefore, if Ben had successfully revised all 13 errors, his score would be 13*3 = 39. Therefore, Ben’s first revision percentage score was 15/39, which equaled 38%.

In the first draft of the first writing assignment, the teacher and the grader provided thirteen error feedback points to Ben. In the second draft of the first writing assignment, Ben did not attempt to revise one WO error, one MW error, and one MGC error. Two IC errors, four WS errors, and one MW error were revised with negative effects. One IC error was revised with positive and negative mixed effects. One IC error and one MGC error were revised with positive effects.

Examples (more examples will be discussed in the cross-case analysis):

- *决定是否你们应该结婚 “Decide if you should get married” (1st-draft, WO error).
  
  No change: 决定是否你们应该结婚 “Decide if you should get married” (2nd-draft).

- *所以不都的中国 “so not all of China” (1st-draft, IC error).
  
  Negative effect: 所以不都中国人 “so not all of Chinese” (2nd-draft)

- *有的人从不没找到这样的人 “some people never did not find such a person” (1st-draft, IC error).
  
  Mixed effect: 有的人可能从不找到这样的人 “some people might never find such a person” (2nd-draft).

- *既然你不同意 “since you do disagree” (1st-draft, WS error).
Positive effect: 即使你不同意 “even if you disagree” (2nd-draft).

In the first draft of the second writing assignment, the teacher and the grader provided fourteen error feedback points to Ben. In the second draft of the second writing assignment, Ben’s revision efforts produced obviously improved results. Three IC errors and one WO error were not revised at all. One WS error was revised with positive and negative mixed effects. Three WS errors, one IC error, three MW errors, and two MGC errors were revised with positive effects.

In the first draft of the third writing assignment, the teacher and the grader provided sixteen error feedback points to Ben. In the second draft of the fourth writing assignment, Ben did not attempt to revise two MGC errors. One WS error and one WO error were revised with negative effects. One WS error and one IC error were revised with positive and negative mixed effects. Four WS errors, one IC error, one MGC error, and four MW errors were revised with positive effects.

In the first draft of the fourth writing assignment, the teacher and the grader provided nine error feedback points to Ben. In the second draft of the fourth writing assignment, Ben attempted to revise all the nine errors. One WS error was revised with negative effects. Two IC errors and one VCO error were revised with positive and negative mixed effects. Two WS errors, two MW errors, and one MGC error were revised with positive effect. Specific examples of positive changes, negative changes, and positive/negative mixed changes will be discussed in the sections of WS, IC, MW, and MGC in the cross-case analysis.

Based on the revision rating form, Ben’s revision scores were 38, 70, 86, and 81 (shown as Figure 7). Ben’s revision scores showed an increasing trend. A notable characteristic of Ben’s revision was that Ben was not doing well in the second draft of the first writing assignment. All the WS errors were revised with negative effects, and some other errors were no changes. The revision rating score in the second draft of the second writing
assignment increased. Based on the four revised writing assignments, Ben was able to revise WS errors and MW errors successfully. Ben revised MGC errors with negative effects in the first writing assignment, but he could revise MGC errors with positive effects after the first interview. Figure 7 shows a tendency line for Ben’s revision scores.

![Graph showing Ben's revision scores](image)

**Figure 7.** A tendency line for Ben’s revision scores.

**Ben: the Characteristics and Distribution of Errors**

Table 14 displays Ben’s error numbers and percentages in the first draft of each writing assignment.
Table 14. Ben’s Errors in the First Draft of Each Writing Assignment.

<table>
<thead>
<tr>
<th></th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ben.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Errors</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Word substitution (WS)</td>
<td>4 (30.77%)</td>
<td>4 (28.57%)</td>
<td>6 (37.5%)</td>
<td>3 (33.33%)</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td>4 (30.77%)</td>
<td>4 (28.57%)</td>
<td>2 (12.5%)</td>
<td>2 (22.22%)</td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td></td>
<td></td>
<td></td>
<td>1 (11.11%)</td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td>2 (15.38%)</td>
<td>2 (14.29%)</td>
<td>3 (18.75%)</td>
<td>1 (11.11%)</td>
</tr>
<tr>
<td>Word order (WO)</td>
<td>1 (7.69%)</td>
<td>1 (7.14%)</td>
<td>1 (6.25%)</td>
<td></td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>2 (15.38%)</td>
<td>3 (21.43%)</td>
<td>4 (25%)</td>
<td>2 (22.22%)</td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 8 shows a tendency line for Ben’s errors in the first draft of each writing assignment.
In the first draft of the first writing assignment, Ben produced 305 Chinese characters, the teacher and the grader provided thirteen error feedback points to Ben, including four IC errors, four WS errors, two MGC errors, two MW errors, and one WO error. In the first draft of the second writing assignment, Ben produced 301 Chinese characters, the teacher and the grader provided fourteen error feedback points to Ben, including four WS errors, four IC errors, three MW errors, two MGC errors, and one WO error. In the first draft of the third writing assignment, Ben produced 315 Chinese characters, the teacher and the grader provided sixteen error feedback points to Ben, including six WS errors, four MW errors, two IC errors, three MGC errors, and one WO error. In the first draft of the fourth writing
assignment, Ben produced 315 Chinese characters, the teacher and the grader provided nine error feedback points to Ben, including three WS errors, two MW errors, two IC errors, one MGC error, and one VCO error.

Based on the data in the chart, Ben’s total errors in the first three writing assignments remained similar: thirteen, fourteen, and sixteen respectively. The number of errors in the fourth writing assignment decreased: the number of errors was nine. The distribution of error categories in the four writing assignments remained similar: the error categories mainly were WS, IC, MGC, WO, and MW. Since Ben used large numbers of short sentences, there were no VO, SC, WP, and SL errors. The numbers of WS errors, IC errors, and MW errors in the

**Ben’s Views of the Computer-Mediate Coded WCF?**

Table 15 displays Ben’s response to the surveys. The researcher also used interview data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 15.** Ben’s Views on the Computer-mediated Coded WCF.

<table>
<thead>
<tr>
<th>Ben</th>
<th>1st-survey</th>
<th>2nd-survey</th>
<th>3rd-survey</th>
<th>4th-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>feedback system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers’ feedback</td>
<td>Very</td>
<td>Very</td>
<td>Very</td>
<td>Very</td>
</tr>
<tr>
<td>important.</td>
<td>important.</td>
<td>important.</td>
<td>important.</td>
<td>important.</td>
</tr>
<tr>
<td>Coded error corrections</td>
<td>Very</td>
<td>Very</td>
<td>Very</td>
<td>Extremely</td>
</tr>
<tr>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
</tr>
<tr>
<td>Computer-mediated coded WCF</td>
<td>Very</td>
<td>Very</td>
<td>Extremely</td>
<td>Extremely</td>
</tr>
<tr>
<td>WCF</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
</tr>
<tr>
<td>Errors statistical functions</td>
<td>Very</td>
<td>Very</td>
<td>Very</td>
<td>Somewhat</td>
</tr>
<tr>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
<td>helpful.</td>
</tr>
</tbody>
</table>
Ben had consistently positive attitudes toward computer-mediated coded WCF. Based on the four surveys, Ben chose either extremely helpful or very helpful when answered the questions “how do you feel about coded error correction?” and “how do you feel about computer-mediated coded WCF?”. Ben also expressed that he did not know how to revise certain types of errors at the very beginning. In the first survey, Ben answered that it was not easy to understand the error types. Ben mentioned that he thought some error codes were useless, since he could not understand the codes or because he did not know how to fix the error that had the code attached to it. In the second survey, he said that correcting WS errors was useless. In the third and fourth survey, he began to think correcting errors was useful; he mentioned in the third survey that the coded WCF might be useful for long-term development and that coded WCF helped him learn writing strategies. Ben also mentioned that he was unfamiliar with various components of this method at the beginning, including indirect coded WCF, error types, the procedures of multiple-draft Chinese writing, and the online settings. In the first interview, he mentioned that he needed time to get familiar with the online system, but in the second interview, he indicated that the online system was easy to use. Surveys show that Ben was not initially familiar with the online multiple-draft writing setting. When asked if “the website has a user-friendly interface?” and if “online multiple-draft writing is easy to use?”, Ben’s responses showed changes from “neutral” (1st-survey) to “easy to use” (3rd-survey).

The trends showed that Ben had consistently positive attitudes toward computer-mediated coded WCF, answering “very helpful” in the four surveys. Ben showed an increasing familiarity with the online multiple-draft writing setting: he was not familiar with the online setting at the beginning, but he gradually got familiar with it. Regarding the technology functions on the CMS, Ben answered “very helpful” at the beginning, but his answer changed to “somewhat helpful” in the fourth survey.
What Factors Influenced Ben’s Incorporation of Feedback?

Regarding to what factors influenced students’ incorporation of teacher feedback in their writing, there were four factors that impacted Ben’s revisions, including his positive attitudes toward the indirect coded WCF in multiple-draft online settings, his unfamiliarity with the online multiple-draft Chinese writing and coded WCF, his carelessness, and his gradually improved revision skills. The following paragraphs provide detailed information.

Ben had consistently positive attitudes toward WCF and multiple-draft Chinese writing in the CMS. In the first interview, Ben discussed why he believed teachers’ corrective feedback and multiple-draft writing were important:

Ben: “I really want to improve my Chinese reading and writing, I will do something related to U.S. and China, I think I need to read and write a lot of Chinese. In the study-abroad program, I think my speaking and listening are Okay, but I need to improve my reading and writing. I think teachers’ feedback, uh...uh...indirect feedback, help me to improve my Chinese writing.” (Answered in Chinese, translated into English) (1st-interview).

At the end of the study, Ben held the same attitude towards WCF and multiple-draft Chinese writing in CMS settings:

Ben: “The time I spent on revising errors is worthwhile. I think if I just write something I will not know where I am wrong, I do not know my mistakes, but if I need to revise the errors, I can know my errors.” (Answered in Chinese, translated into English) (4th-interview).

Ben made improvements on revision scores since the third writing assignment. When the researcher asked why he had relatively low scores on the first two revisions and had high scores on the last two revisions, and why he ignored certain errors, Ben said that the reason for not correcting some errors in the first two revisions was due to his carelessness.

Ben: “Uh...uh...I did not see that.” (1st-interview).
Ben also expressed that he did not know how to revise certain types of errors at the very beginning. Therefore, he chose to ignore the errors which he did not know how to correct and waited for teachers’ explanations. After the third writing assignment, he began to develop his own ability to correct these types of errors. In the first interview, Ben said “it is pretty difficult to correct these errors, I don’t know how to correct”. In the third interview, Ben began to mention how he used online dictionaries, searching functions, even a corpus to compare his words with the words in dictionaries.

Ben: “For IC errors, I think it is hard to correct, I used internet and e-dictionary, I did not try to correct the IC errors individually anymore, I just tried to kind of re-word it, to re-word it, try to make it make sense.” (3rd-interview).

Ben also mentioned that he was unfamiliar with various components of this method at the beginning, including indirect coded WCF, error types, the procedures of multiple-draft Chinese writing, and the online settings, which were new to most of the participants. This unfamiliarity impacted some student participants’ revisions, including Ben’s, more detail will be discussed in the cross-case analysis section. Ben said he was familiar with teachers’ direct feedback in the first interview:

Ben: “Professors usually provided direct feedback to me, but last semester, a professor used codes to provide feedback, I revised the errors based on the codes, but it was the final assignment, so I did not have a chance to know if I revised correct or wrong, this method is still pretty new to me. (Answered in Chinese, translated into English) (1-st interview).

Ben was not initially familiar with the online multiple-draft writing setting. When discussing how this unfamiliarity impacted his corrections, Ben responded that he scheduled 40 minutes to revise the essay, but he spent 20 minutes to figure out how to use the online multiple-draft writing setting, therefore, Ben did not have sufficient time to correct the errors.
Ben: “I scheduled 40 minutes to revise the essay, I took 20 minutes to figure out the computer, uh...uh...to figure out the codes, I spent a lot of time on this, I have other homework assignments to do.” (1st-interview).

Mary

Mary had similar Chinese learning goals as Ben for learning Chinese. Mary was a junior undergraduate student majoring in East Asian Studies and concentrated on Chinese Languages and Literatures. Mary had been learning Chinese for two and a half years. Mary had passed first-year Chinese courses, second-year Chinese courses, and a third-year Chinese course at the beginning of the spring semester of 2018. Mary also participated in the immersive study-abroad summer intensive program in China. Mary aimed to apply for a graduate program in Chinese Languages and Literatures. Her Chinese language proficiency level was intermediate-mid in terms of ACTFL proficiency guidelines.

Mary’s Revision Scores

Table 16 shows Mary’s revision scores.

<table>
<thead>
<tr>
<th>Mary</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>MGC*2</td>
<td>WS*1</td>
<td>MGC*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VCO*1</td>
<td>MW*2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>WS*1</td>
<td></td>
<td>MW*3</td>
<td></td>
</tr>
<tr>
<td>Effect negative</td>
<td>IC*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>WS*1</td>
<td>WS*1</td>
<td>WS*4</td>
<td>WS*3</td>
</tr>
<tr>
<td>Effect mixed</td>
<td>IC*1</td>
<td>MW*2</td>
<td>MW*4</td>
<td>IC*3</td>
</tr>
<tr>
<td>Change,</td>
<td>WS*1</td>
<td>WS*1</td>
<td>WS*2</td>
<td>WS*3</td>
</tr>
<tr>
<td>Effect positive</td>
<td>IC*2</td>
<td>MW*2</td>
<td>IC*2</td>
<td>IC*3</td>
</tr>
<tr>
<td>Score</td>
<td>25</td>
<td>18</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>% score</td>
<td>59/100</td>
<td>50/100</td>
<td>92/100</td>
<td>100/100</td>
</tr>
</tbody>
</table>

Notes: WS=word substitution, IC=incorrect chunks, VO=verb object, VCO=verb
complement object, SVO=subject verb object order, MGC=missing grammatical components, WO=word order, SC=sentence connector, MW=missing word, WP=wrong preposition, SL=spoken language.

In the first draft of the first writing assignment, the teacher and the grader provided fourteen error feedback points to Mary. In the second draft of the first writing assignment, Mary did not attempt to revise two MGC errors and one VCO error. One WS error, one IC error, and two MW errors were revised with negative effects. Mary successfully revised one WS error, two IC errors, two MGC errors, and two MW errors.

Examples (more examples will be discussed in the cross-case analysis):

- *在中国婚姻是一个家庭的大事 “In China marriage is a big family event” (1st-draft, MGC error).

  No change: 在中国婚姻是一个家庭的大事 “In China marriage is a big family event” (2nd-draft).

- *只有问什么时候结婚 “only ask when to marry” (1st-draft, IC error).

  Negative effect: 只问什么时候结婚 “only ask when to marry” (2nd-draft).

- *我觉得在中国，婚姻论男生比女生更有利 “I think in China, marriage is more beneficial for boys than for girls” (1st-draft, IC error).

  Positive effect: 我觉得在中国，婚姻对男人比较更有利 “I think in China, marriage is more beneficial to men” (2nd-draft).

In the first draft of the second writing assignment, the teacher and the grader provided twelve error feedback points to Mary. In the second draft of the second writing assignment, one WS error and two MW errors were not revised at all. Three MW errors were revised with negative effects. One WS error, one IC error, and one SVO error were revised with positive and negative mixed effects. One WS error and two WO errors were revised with positive effects.
In the first draft of the third writing assignment, the teacher and the grader provided thirteen error feedback points to Mary. In the second draft of the third writing assignment, Mary did not attempt to revise one MGC error. All four WS errors, all four MW errors, all two IC errors, and two MGC errors were revised correctly.

In the first draft of the fourth writing assignment, the teacher and the grader provided six error feedback points to Mary. In the second draft of the fourth writing assignment, Mary attempted to revise all the errors: all three WS errors and all three IC errors were revised with positive effects.

Mary’s four revision scores were 59, 50, 92, and 100 (shown as Figure 9). Mary’s revision scores showed an increasing trend. Based on such data, Mary made improvement since the third writing assignment. Analysis revealed that Mary could not revise the WS errors, the IC errors, and the MW errors with positive effects on the first two writing assignments; afterward, Mary started to successfully correct these three categories of error. However, Mary still could not revise MGC errors successful. Mary tried to revise SVO and VCO errors in long and complicated sentences; however, the modified effects were negative effects. Figure 9 shows a tendency line for Mary’s revision scores.

![Figure 9. A tendency line for Mary’s revision scores.](image-url)
Mary: the Characteristics and Distribution of Errors

Table 17 displays Mary’s error numbers and percentage in the first draft of each writing assignment.

Table 17. Mary’s Errors in the First Draft of Each Writing Assignment.

<table>
<thead>
<tr>
<th>Mary</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Errors</td>
<td>14</td>
<td>12</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Word substitution (WS)</td>
<td>2 (14.29%)</td>
<td>3 (25%)</td>
<td>4 (40.77%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td>3 (21.43%)</td>
<td>1 (8.33%)</td>
<td>2 (15.38%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td>1 (7.14%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td>1 (8.33%)</td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td>4 (28.57%)</td>
<td></td>
<td>3 (23.08%)</td>
<td></td>
</tr>
<tr>
<td>Word order (WO)</td>
<td></td>
<td></td>
<td>2 (16.67%)</td>
<td></td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>4 (28.57%)</td>
<td>5 (41.67%)</td>
<td>4 (30.77%)</td>
<td></td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 10 shows a tendency line for Mary’s errors in the first draft of each writing assignment and revision scores.
Figure 10. A tendency line for Mary’s errors in the first draft of each writing assignment.

In the first draft of the first writing assignment, Mary produced 319 Chinese characters, the teacher and the grader provided fourteen error feedback points to Mary, including four MW errors, four MGC errors, three IC errors, two WS errors, and one VCO error. In the first draft of the second writing assignment, Mary produced 303 Chinese characters, the teacher and the grader provided twelve error feedback points to Mary, including five MW errors, two WO errors, three WS errors, one IC error, and one SVO error. In the first draft of the third writing assignment, Mary produced 301 Chinese characters, the teacher and the grader provided thirteen error feedback points to Mary, including four MW errors, three MGC errors, four WS errors, and two IC errors. In the first draft of the fourth writing assignment, Mary produced 309 Chinese characters, the teacher and the grader provided six error feedback points to Mary, including three WS errors and three IC errors.

Regarding Mary’s total error numbers, the total number of errors showed a decreasing trend: 14, 12, 13, and 6. The error numbers of the first three writing assignments were
similar: fourteen, twelve, and thirteen. The error number of the fourth writing assignment decreased to six. The distribution of error categories in the four writing assignments were similar: the error categories were mainly IC, MGC, MW, WS, and WO. Mary tried to write long and complicated sentences, for example, “年轻人择偶的时候也考虑爱人的性格、教育背景，人品，是否幽默等等” (When young people choose their spouse, they also consider the character of their lover, their educational background, their humor, etc.). Therefore, there were some VCO and SVO errors in the four writing assignments. Mary’s numbers of WS errors and IC errors did not change obviously among these four writing assignments. Error categories like MW and MGG disappeared in the fourth writing assignment, therefore, it provided evidence of acquisition in writing accuracy in the changes in errors over the course of the semester.

**Mary’s Views of the Computer-Mediate Coded WCF?**

Table 18 displays Mary’s response to the surveys. The researcher also used interview data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 18. Mary’s Views on the Computer-mediated Coded WCF.**

<table>
<thead>
<tr>
<th>Mary</th>
<th>1st-survey</th>
<th>2nd-survey</th>
<th>3rd-survey</th>
<th>4th-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online multiple-draft writing feedback system</td>
<td>Neutral.</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
</tr>
<tr>
<td>Mary</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;-survey</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;-survey</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;-survey</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;-survey</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Computer-mediated coded WCF</td>
<td>Extremely helpful.</td>
<td>Extremely helpful</td>
<td>Extremely helpful</td>
<td>Extremely helpful</td>
</tr>
</tbody>
</table>

Mary had similar attitudes and views as Ben toward the computer-mediated coded WCF. Mary had consistently positive attitudes toward WCF and multiple-draft Chinese writing in the CMS. In all four surveys, Mary chose either helpful or very helpful when asked the questions “how do you feel about coded error correction?” and “how do you feel about computer-mediated coded WCF?”.

Surveys also showed that Mary was not initially familiar with the online multiple-draft writing setting. When asked “how easy is it to understand the error codes?”, Mary indicated in the first survey that understanding the error codes was neutral (not very easy), but in the second survey, she indicated that it was very easy to understand the error codes. When asked “how easy is it to understand how to use the online multiple-draft writing feedback system?”, Mary’s answers were similar to Ben’s. In the first survey, Mary said that it required time for her to become familiar with the new website, and in the second survey, she thought the website was very easy to use.

When asked if “the website has a user-friendly interface?” and if “the website is easy to navigate?”, Mary’s responses showed changes from neutral (1<sup>st</sup>-survey and 2<sup>nd</sup>-survey) to easy to use (3<sup>rd</sup>-survey and 4<sup>th</sup>-survey), which also corresponded with changes in her answers to the question “how easy is it to understand how to use the online multiple-draft writing
feedback system?” (from “neutral” to “easy to use”).

**What Factors Influenced Mary’s Incorporation of Feedback?**

Mary had similar factors as Ben for incorporation of teacher feedback. There were three factors that impacted Mary’s revisions, including her positive attitudes toward the indirect coded WCF in multiple-draft online settings, her unfamiliarity with the online multiple-draft Chinese writing and coded WCF, and her gradually improved revision skills. The following paragraphs provide detailed information.

Mary had consistently positive attitudes toward WCF and multiple-draft Chinese writing in the CMS. In the first interview, Mary discussed why she believed teachers’ corrective feedback and multiple-draft writing were important:

Mary: “I spent an hour on considering how to revise the errors. I think teachers’ feedback is important, uh, it will help me know where I went wrong. My plan is to study Chinese languages and literatures. I may need to write papers in Chinese. I think it is important to me.” (Answered in Chinese, translated into English) (1st-interview).

At the end of the study, Mary held the same attitude towards WCF and multiple-draft Chinese writing in CMS settings:

Mary: “I valued teachers’ corrective feedback. I think if we did not use this method, it would be good for teachers, because you (the teacher) can save a lot of time, but teacher feedback helped me a lot. It is really helpful, I also like the online settings, I can get back and review my papers, and I can also review the errors and try to figure out some grammar rules.” (Answered in Chinese, translated into English) (4th-interview).

Mary made improvements on revision scores since the third writing assignment. When the researcher asked why she had relatively low scores on the first two revisions and had high scores on the last two revisions, and why she ignored certain errors, Mary expressed that she did not know how to revise certain types of errors at the very beginning. Therefore,
she chose to ignore the errors which she did not know how to correct and waited for teachers’ explanations. In the second interview, Mary said “I did not know how to correct the MGC, WS, and IC errors in the first two writings, I waited to ask for help from teachers or teaching assistants”. After the third writing assignment, she began to develop her own ability to correct these types of errors:

Mary: “I found some useful tools to help me. I used an online grammar book, it is called Allset learning, it is a Chinese resource wiki, I checked what I could use, I also used Pleco, it is a Chinese-English dictionary in the App store, I used it on my cellphone, I used them to compare what I wrote.” (3rd-interview).

Mary also mentioned that she was unfamiliar with various components of this method at the beginning, including indirect coded WCF, error types, the procedures of multiple-draft Chinese writing, and the online settings. Mary said she was familiar with teachers’ direct feedback and unfamiliar with teachers’ coded WCF in the first interview:

Mary: “I usually received teachers’ direct feedback, in the last two years, teachers posted feedback (direct error feedback) on Canvas so that I could check the feedback….the coded and indirect feedback, I think, it is new to me.” (Answered in Chinese, translated into English) (1st-interview).

Interviews showed that Mary was not initially familiar with the online coded feedback. In the first interview, Mary also expressed her concerns with her own unfamiliarity with the error codes:

Mary: “Sometimes, I do not remember which color they (error codes) were.” (1st-interview).

Similar to Ben, Mary’s case showed that she had consistently positive attitudes toward the indirect coded WCF in multiple-draft online settings. Her first two revision scores were relatively low, a result she attributed to her unfamiliarity with the multiple-draft Chinese
writing, indirect coded WCF, error types, her carelessness, and the CMS. She also indicated that she gradually explored the revision strategies which helped her improve her revision scores after the third writing assignment.

**Paul**

Paul was a senior undergraduate student majoring in Mechanical Engineering. He wanted to learn Chinese because his family was trading vehicle parts with companies in Wenzhou, China; his family needed him to translate in the business, and he aimed to continue and extend the business with Chinese companies after graduation. Paul had completed first-year Chinese courses, second-year Chinese courses, and a third-year Chinese course in the Chinese program, and he also participated in the study-abroad program in China. At the beginning of the semester, he told the researcher that he would like to improve his listening and speaking rather than reading and writing in order to help him to negotiate with Chinese companies. He thought that receiving indirect coded WCF and engaging in multiple-draft Chinese writing would not fulfill his needs and requirements. Paul’s Chinese language proficiency level was intermediate-low based on ACTFL proficiency guidelines.

**Paul’s Revision Scores**

Table 19 presents Paul’s revision scores.

**Table 19.** Paul’s Revision Rating Form.

<table>
<thead>
<tr>
<th>Paul</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>WS*1</td>
<td>WS*1</td>
<td>WS*2</td>
<td>WS*1</td>
</tr>
<tr>
<td></td>
<td>MGC*2</td>
<td>MGC*4</td>
<td>IC*1</td>
<td>IC*1</td>
</tr>
<tr>
<td></td>
<td>WO*1</td>
<td></td>
<td>MGC*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MW*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>IC*1</td>
<td>VCO*1</td>
<td>VO*1</td>
<td>IC*1</td>
</tr>
<tr>
<td>Effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mixed</td>
<td>IC*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change,</td>
<td>WS*2</td>
<td>WS*10</td>
<td>WS*10</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>IC*1</td>
<td>IC*3</td>
<td>MGC*3</td>
<td></td>
</tr>
<tr>
<td>positive</td>
<td>MW*1</td>
<td></td>
<td>MW*1</td>
<td></td>
</tr>
</tbody>
</table>
## Table 19 (Continued)

<table>
<thead>
<tr>
<th></th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Score</strong></td>
<td>1</td>
<td>10</td>
<td>43</td>
<td>47</td>
</tr>
<tr>
<td>% score</td>
<td>5/100</td>
<td>30/100</td>
<td>75/100</td>
<td>82/100</td>
</tr>
</tbody>
</table>

Notes: WS=word substitution, IC=incorrect chunks, VO=verb object, VCO=verb complement object, SVO=subject verb object order, MGC=missing grammatical components, WO=word order, SC=sentence connector, MW=missing word, WP=wrong preposition, SL=spoken language.

In the first draft of the first writing assignment, the teacher and the grader provided six error feedback points to Paul. In the second draft of the first writing assignment, Paul did not attempt to revise one WS error, two MGC errors, one WO error, and one MW error. One IC error was revised with negative effect.

Examples (more examples will be discussed in the cross-case analysis):

- *看起来年轻人不会找自己喜欢的人结婚 “It seems that young people will not find someone they like to marry” (1st-draft, WS error).
No change: 看起来年轻人不会找自己喜欢的人结婚 “It seems that young people will not find someone they like to marry” (2nd-draft).

- *同时我也觉得他没有平衡 “At the same time, I also feel that he has no balance” (1st-draft, VCO error).
Negative effect: 他有一点不平衡 “He has a little imbalance” (2nd-draft).

- *因为他帮助了很多人们 “Because he helps a lot of people” (1st-draft, IC error).
Mixed effects: 因为他帮助了很多人们 “Because he helps a lot of people” (2nd-draft).

- *将来他的儿孙也要生小孩 “In the future, his children and grandchildren will also have children” (1st-draft, WS error).
Positive effect: 将来他的儿孙也要生孩子 “In the future, his children and grandchildren will also have children” (2nd-draft).

In the first draft of the second writing assignment, the teacher and the grader provided eleven error feedback points to Paul. In the second draft of the second writing assignment, one WS error, two IC errors, and four MGC errors were not revised at all. One VCO was revised with negative effects. Two WS errors and one IC error were revised with positive effects.

In the first draft of the third writing assignment, the teacher and the grader provided nineteen error feedback points to Paul. In the second draft of the third writing assignment, Paul did not attempt to revise two WS errors, one IC error, and one MGC error. One VO error was revised with negative effects. Ten WS errors, three IC errors, and one MW error were revised with positive effects.

In the first draft of the fourth writing assignment, the teacher and the grader provided nineteen error feedback points to Paul. In the second draft of the fourth writing assignment, one WS error and one IC error were not revised at all. One IC error was revised with negative effects. One WS error and one WO error were revised with positive and negative mixed effects. Ten WS errors, three MGC errors, and one MW error were revised with positive effect.

The revision rating scores of Paul were 5, 30, 75, and 82 (shown as Figure 11). Paul’s revision scores showed an increasing trend. The first revision score was very low, because Paul revised very few of the errors. Most MGC errors and IC errors were not revised in the first and second writing assignments. In the second drafts of the third and fourth writing assignments, the revision rates of WS errors, IC errors, MGC errors, and MW errors were high; however, most WO errors, SVO errors, and VO errors were revised with negative effects. Figure 11 shows a tendency line for Paul’s revision socres.
Figure 11. A tendency line for Paul’s revision scores.

Paul: the Characteristics and Distribution of Errors

Table 20 displays Paul’s error numbers and percentages in the first draft of each writing assignment.

Table 20. Paul’s Errors in the First Draft of Each Writing Assignment.

<table>
<thead>
<tr>
<th>Paul.</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Errors</td>
<td>6</td>
<td>11</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Word substitution (WS)</td>
<td>1 (16.67%)</td>
<td>3 (27.27%)</td>
<td>12 (63.16%)</td>
<td>12 (63.16%)</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td>1 (16.67%)</td>
<td>3 (27.27%)</td>
<td>4 (21.05%)</td>
<td>2 (10.53%)</td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td></td>
<td></td>
<td>1 (5.26%)</td>
<td></td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td></td>
<td>1 (9.09%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td>2 (33.33%)</td>
<td>4 (36.36%)</td>
<td>1 (5.26%)</td>
<td>3 (15.79%)</td>
</tr>
<tr>
<td>Word order (WO)</td>
<td>1 (16.67%)</td>
<td></td>
<td></td>
<td>1 (5.26%)</td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>1 (16.67%)</td>
<td></td>
<td>1 (5.26%)</td>
<td>1 (5.26%)</td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 12 shows a tendency line for Paul’s errors in the first drafts of each writing assignment and revision scores.

![Trend line for Paul's errors](image)

**Figure 12.** A tendency line for Paul’s errors in the first drafts of each writing assignment.

In the first draft of the first writing assignment, Paul produced 289 Chinese characters, the teacher and the grader provided six error feedback points to Paul, including two MGC errors, one WS error, one IC error, one MW error, and one WO error. In the first draft of the second writing assignment, Paul produced 291 Chinese characters, the teacher and the grader provided eleven error feedback points to Paul, including four MGC errors, three WS errors, three IC errors, and one VCO error. In the first draft of the third writing assignment, Paul produced 301 Chinese characters, the teacher and the grader provided nineteen error feedback points to Paul, including twelve WS errors, four IC errors, one VO error, one MW error, and one MGC error. In the first draft of the fourth writing assignment, Paul produced 304 Chinese characters, the teacher and the grader provided nineteen error
feedback points to Paul, including twelve WS errors, three MGC errors, two IC errors, one
MW error, and one WO error.

Paul showed a special case. The total number of errors showed an increasing trend: 6, 11, 19, and 19. There were few errors in the first draft of the first writing assignment (only six errors), but there were a lot of errors in the second, third, and fourth writing assignments (eleven, nineteen, nineteen, respectively). Especially for the WS errors, the total error numbers increased in the four writing assignments (one, three, twelve, twelve). The
distribution of error categories in the four writing assignments was also similar: the errors
mainly fell into the categories of WS error, IC error, MGC error, WO error, and MW error.
There were not many errors in SVO, VCO, VO, and SC.

**Paul’s Views of the Computer-Mediate Coded WCF?**

Table 21 displays Paul’s response to the surveys. The researcher also used interview
data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 21. Paul’s Views on Computer-mediated Coded WCF.**

<table>
<thead>
<tr>
<th>Paul</th>
<th>1(^{st})-survey</th>
<th>2(^{nd})-survey</th>
<th>3(^{rd})-survey</th>
<th>4(^{th})-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>feedback system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers’ feedback</td>
<td>Not so important.</td>
<td>Neutral.</td>
<td>Very important.</td>
<td>Very important.</td>
</tr>
</tbody>
</table>
Based on Paul’s survey table above, in the first survey, Paul had negative attitudes and views towards the computer-mediated WCF: he thought it was hard to understand error codes, the online writing feedback system was useless, teachers’ feedback on speaking and listening was useful, it took too much time to correct errors, and the interface and navigation of the website were not easy to use. In the first revision, Paul only had five points. (Paul did not make many errors in the first draft of the first writing assignment; thus, based on the revision rating criteria, the researcher converted the scores into percentages, which could more accurately reflect the characteristics of Paul's modifications). Paul did not take correcting errors very seriously. In the second survey, Paul’s attitudes and views toward the coded online WCF did not change: Paul said that it was stressful to revise his writing assignments as it took a lot of time, and he insisted that his teacher should provide feedback on his listening and speaking. He also said the website was not easy to use. Thus, in the second draft of his second writing assignment, he chose not to correct some errors or did not seriously revise them.

Only during the third writing assignment, when Paul realized that the effects of revisions would affect his assignment grades (Paul’s first two revision scores were 5 and 30), did his attitudes change and he began to revise the errors seriously. The survey also showed changes in his views on the indirect coded WCF and multiple-draft online Chinese writing settings.

In the third survey, he said his understanding of the error codes was neutral, he began to consider the online writing system and teacher’s WCF somewhat helpful, and he chose “neutral” when describing the interface and navigation of the website (neither not easy to use nor very easy to use). In the fourth survey, he realized that online coded WCF could help him to improve revision skills, and he mentioned that the online writing feedback system, teacher’s WCF, and computer-mediated coded WCF were very useful. Thus, the four surveys
revealed changing attitudes toward the computer-mediated coded WCF. Paul criticized the interface and navigation of the website as not very user-friendly. He only gave a “neutral” rating to the design of the website, and he mentioned that compared to some commercial websites, the online writing feedback system needed to be updated.

**What Factors Influenced Paul’s Incorporation of Feedback?**

Regarding what factors influenced Paul’s incorporation of teacher feedback in their writing, there were four factors that impacted Paul’s revisions, including Paul did not understand the purposes of the online indirect coded WCF and the multiple-draft Chinese writing at the very beginning, Paul’s learning purposes, Paul’s negative attitudes and views, and the change of his attitudes.

Paul was not clear about the purposes of the online indirect coded WCF and the multiple-draft Chinese writing. The total number of errors in his first drafts of the first writing assignment was the least compared with other five participants, which was in contrast to the first drafts of their second and third writing assignments, especially for the WS errors. Paul had only one WS error in the first-draft of the first writing assignment, but twelve WS errors in the first-draft of the third writing assignment. In the interview, the researcher tried to find out the reasons. After Paul submitted the second draft of the first writing assignment, the researcher interviewed Paul. Paul explained that he thought accuracy was the most important part of Chinese writing, so he tried to use familiar words and phrases.

Paul: “Uh, uh, I spent one hour on this, and I think accuracy is the most important, I used some familiar words, and, and, uh..., I reviewed my previous writing works, perhaps, from last semester; I tried to use some familiar sentence structures, words, I hope I can have a good score, you know, GPA is very important to me.” (Answered in Chinese, translated into English) (1st-interview).

Paul’s negative attitudes and views toward online indirect coded WCF had a certain
impact on the revision effects. In the first revision, Paul only had five points. Paul found out that it was stressful to revise his writing assignment as it took a lot of time. Thus, at the beginning, he chose not to correct some errors or did not seriously revise them. In the first interviews, Paul complained about using this method in the Chinese class.

Paul: “You know, as I told you before, I am learning Chinese for doing business with companies in China, I want to improve listening and reading, so I can talk to them, I feel very frustrated that the content in this class cannot help me, it is not very helpful. I have to tell you, I am preparing for graduation this semester, my major is Mechanical Engineering, it is very hard, and I am a student organization chair at school, I have a lot of work to do, and I am helping my family to do business with China’s companies, I have already written an essay in Chinese, I do not want to spend a lot of time on revising this.” (Answered in Chinese and English, translated into English) (1st-interview).

According to Paul’s responses in the third and fourth interviews, in the process of careful revision, he gradually realized that he could learn a lot in this process. In the third interview and the fourth interview, Paul explained his changing attitudes in detail.

Paul: “I think it helps me reading, and I think reading is kind of important, last week, we were trying to find some supplier from Taobao.com (a Chinese trading website), I found out that I need to read a lot, I need to read all the information in Chinese about vehicle. I think I also need to read contracts, and I need to revise some terms and conditions in the future, learning how to revise errors, I think, is kind of important.” (Answered in Chinese and English, translated into English) (3rd-interview).

Paul: “I think writing actually is widely used in China, when I am contacting China’s suppliers, they did not want to call me or talk to me, I have to write something on WeChat (a Chinese messaging application) and I also need to read what they write on WeChat or Wangwang (a Chinese trading messaging application), I do not know why they do not like
speaking, they like writing something on the App, but the revising practice helps me to know how to search and compare information and find out if what I said was correct." (Answered in Chinese and English, translated into English) (4th-interview).

Paul showed dynamic views toward the computer-mediated coded WCF, from negative views on the computer-mediated coded WCF to positive views on the computer-mediated coded WCF, which impacted Paul’s revision scores, with his revision scores increasing from the first revision to the second revision. Another trend was observed that Paul’s changing learning purposes also impacted his error numbers and revision scores. After Paul realized that the effectiveness of WCF could help him improve communicative skills, he began to take the computer-mediated coded WCF and the multiple-draft writing seriously. In addition, Paul indicated that the development of revision skills helped him revise errors.

**Daniel**

Daniel was a senior undergraduate student majoring in International Studies; he wanted to pursue a job for which he could use Chinese language in the U.S. He had completed first-year Chinese courses and second-year Chinese courses in the Chinese program. He paused learning Chinese for one year because of personal issues. He participated in another university’s third-year level study-abroad immersive program in China; therefore, the director of the Chinese program required Daniel to take a placement test to decide which Chinese class he could enroll in. Based on the placement test, Daniel enrolled in the Advanced Conversation Chinese course in the spring semester of 2018. Daniel’s study-abroad program focused on training speaking and listening, and its teaching philosophy was teacher-centered, concentrating on language accuracy and grammatical explanations, rather than being student-centered and valuing self-learning. Daniel expressed a negative attitude towards the indirect WCF because he believed that teachers should lead students to learn. Based on the writing assignments, surveys, and interviews, Paul and Daniel showed some
similarities, and Daniel’s Chinese language proficiency level was intermediate-low based on ACTFL proficiency guidelines.

**Daniel’s Revision Scores**

Table 22 shows Daniel’s revision scores.

**Table 22. Daniel’s Revision Rating Form.**

<table>
<thead>
<tr>
<th>Daniel</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>MGC<em>1 WO</em>1</td>
<td>MGC*2</td>
<td>MW*1</td>
<td></td>
</tr>
<tr>
<td>Change, Effect</td>
<td>MW*1</td>
<td>WS<em>5 IC</em>3 WO*2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change, Effect</td>
<td>WS*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change, Effect</td>
<td>MGC<em>1 MW</em>2</td>
<td>WS<em>3 IC</em>2 MGC<em>1 MW</em>1</td>
<td>WS<em>6 IC</em>1 MGC<em>1 MW</em>3</td>
<td>IC*3</td>
</tr>
<tr>
<td>Score</td>
<td>12</td>
<td>31</td>
<td>33</td>
<td>9</td>
</tr>
<tr>
<td>% score</td>
<td>57/100</td>
<td>54/100</td>
<td>92/100</td>
<td>100/100</td>
</tr>
</tbody>
</table>

Notes: WS=word substitution, IC=incorrect chunks, VO=verb object, VCO=verb complement object, SVO=subject verb object order, MGC=missing grammatical components, WO=word order, SC=sentence connector, MW=missing word, WP=wrong preposition, SL=spoken language.

In the first draft of the first writing assignment, the teacher and the grader provided seven error feedback points to Daniel. In the second draft of the first writing assignment, Daniel did not attempt to revise one MGC error and one WO error. One MW error was revised with negative effects. One WS error was revised with positive and negative mixed effects. One MGC error and two MW errors were revised with positive effects.

Examples (more examples will be discussed in the cross-case analysis):

- *相亲发生在印度 “Blind date occurs in India” (1st-draft, WO error).

  No change: 相亲发生在印度 “Blind date occurs in India” (2nd-draft).

- *田地被淹了，而很多人都被淹死了 “The field was flooded, but many people are
drowned” (1\textsuperscript{st}-draft, WO error).

Negative effect: 并而很多人都被淹死了 “And but many people are drowned” (2\textsuperscript{nd}-draft).

• *我也想做他一样的努力 “I also want to do his same effort” (1\textsuperscript{st}-draft, WS error).

Mixed effects: 我也想模仿他一样的努力 “I also want to imitate his hard work” (2\textsuperscript{nd}-draft).

• *大家很激他的努力 “Everyone is very grateful for his efforts” (1\textsuperscript{st}-draft, MW error).

Positive effects: 大家很感激他的努力 “Everyone is very grateful for his efforts” (2\textsuperscript{nd}-draft).

In the first draft of the second writing assignment, the teacher and the grader pointed out nineteen errors to Daniel. In the second draft of the second writing assignment, two MGC errors were not revised at all. Five WS errors, three IC errors, and two WO errors were revised with negative effects. Three WS errors, two IC errors, one MGC error, and one MW error were revised with positive effects.

In the first draft of the third writing assignment, the teacher and the grader provided twelve error feedback points to Daniel. In the second draft of the third writing assignment, Daniel did not attempt to revise one MW error. All the six WS errors, one MGC error, three MW errors, and One IC error were revised correctly.

In the first draft of the fourth writing assignment, the teacher and the grader provided three error feedback points to Daniel. In the second draft of the fourth writing assignment, Daniel attempted to revise all errors and he corrected all three IC errors successfully.

The revision rating scores of this participant were 57, 54, 92, and 100 (shown as Figure 13). Daniel’s revision scores showed an increasing trend. On the second draft of the third writing assignment, the revision score increased from 54 to 92. Daniel could not
successfully revise the WS errors and IC errors in the first two writing assignments, but the WS errors and IC errors were revised with positive effects beginning with the third writing assignment. Figure 13 shows a tendency line for Daniel’s revision scores.

**Figure 13.** A tendency line for Daniel’s revision scores.

**Daniel: the Characteristics and Distribution of Errors**

Table 23 displays Daniel’s error numbers and percentages in the first draft of each writing assignment.
Table 23. Daniel’s Errors in the First Drafts of Each Writing Assignment.

<table>
<thead>
<tr>
<th></th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Errors</strong></td>
<td>7</td>
<td>19</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td><strong>Word substitution (WS)</strong></td>
<td>1 (14.29%)</td>
<td>8 (42.11%)</td>
<td>6 (50%)</td>
<td></td>
</tr>
<tr>
<td><strong>Incorrect chunks (IC)</strong></td>
<td></td>
<td>5 (26.32%)</td>
<td>1 (8.33%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td><strong>Verb object (VO)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verb complement object (VCO)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SVO order (SVO)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Missing grammatical components (MGC)</strong></td>
<td>2 (28.57%)</td>
<td>3 (15.79%)</td>
<td>1 (8.33%)</td>
<td></td>
</tr>
<tr>
<td><strong>Word order (WO)</strong></td>
<td>1 (14.29%)</td>
<td>2 (10.53%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sentence connector (SC)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Missing word (MW)</strong></td>
<td>3 (42.86%)</td>
<td>1 (5.26%)</td>
<td>4 (33.33%)</td>
<td></td>
</tr>
<tr>
<td><strong>Wrong preposition (WP)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spoken language (SL)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 14 shows a tendency line for Daniel’s errors in the first drafts of each writing assignment and revision scores.
In the first draft of the first writing assignment, Daniel produced 307 Chinese characters, the teacher and the grader provided seven error feedback points to Daniel, including three MW errors, two MGC errors, one WS error, and one WO error. In the first draft of the second writing assignment, Daniel produced 304 Chinese characters, the teacher and the grader pointed out nineteen errors to Daniel, including eight WS errors, five IC errors, three MGC errors, two WO errors, and one MW error. In the first draft of the third writing assignment, Daniel produced 311 Chinese characters, the teacher and the grader provided twelve error feedback points to Daniel, including six WS errors, four MW errors, one IC error, and one MGC error. In the first draft of the fourth writing assignment, Daniel produced 315 Chinese characters, the teacher and the grader provided three error feedback points to Daniel, including three IC errors.

The total number of errors showed a decreasing trend in the last three writing assignments.
assignments: 19, 12, 3. There were few errors in the first writing assignment (Daniel did not simplify and shorten his sentences); however, the total error numbers of the second and third writing assignments increased to 19 and 12. By the fourth writing assignment, there was a significant decline to 3. When it came to WS errors, there was only one WS error in the first writing assignment; however, there were eight WS errors and six WS errors in the second and third writing assignments. The distribution of error categories in the four writing assignments was similar: the errors mainly fell into the categories of WS, MGC, WS, WO, and IC.

**Daniel’s Views of the Computer-Mediate Coded WCF?**

Table 24 displays Daniel’s response to the surveys. The researcher also used interview data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 24. Daniel’s Views on the Computer-mediated Coded WCF.**

<table>
<thead>
<tr>
<th>Daniel</th>
<th>1st-survey</th>
<th>2nd-survey</th>
<th>3rd-survey</th>
<th>4th-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ feedback</td>
<td>Not important.</td>
<td>Neutral.</td>
<td>Very important.</td>
<td>Very important.</td>
</tr>
</tbody>
</table>
Like Paul, Daniel had similar changes in attitudes toward online coded WCF. Based on Daniel’s survey table above, in the first survey, Daniel had negative attitudes and views towards the computer-mediated WCF: he indicated that it was hard to understand error codes and the online writing feedback system was not very helpful. Daniel had participated in other Chinese programs, in which the programs concentrated on teachers’ direct feedback; thus, he mentioned that face-to-face feedback was the most important type of feedback and that the professor should help him correct the errors. In the first revision, Daniel received 57 points. Daniel believed that teachers’ direct feedback was more effective than the indirect feedback. He found out that it was stressful to revise his writing assignments as he did not know how to correct the errors. Thus, at the beginning, he chose not to correct some errors. The first-survey and the second-survey also showed that Daniel thought the interface and navigation of the website were not easy to use, and it took him a lot of time to find useful information on the website.

The third-survey and the fourth-survey showed changing trends in Daniel’s views on the indirect coded WCF and multiple-draft online Chinese writing settings. Daniel mentioned that it was easy to understand the error codes in the third-survey and the fourth-survey. When asked “how do you feel about coded error corrections?” and “how do you feel about computer-mediated coded WCF?”, Daniel chose either “not helpful” or “somewhat helpful” in the first two surveys, but in the last two surveys, he chose “somewhat helpful” and “very helpful”. Daniel found out that he could learn grammar, vocabulary, and phrases in the process of correcting errors. In the third survey, Daniel said he was getting familiar with the website; thus, the interface and navigations were easy to use.

**What Factors Influenced Daniel’s Incorporation of Feedback?**

Regarding what factors influenced students’ incorporation of teacher feedback in their writing, there were three factors that impacted Daniel’s revisions, including Daniel did not
understand the purposes of the online indirect coded WCF and the multiple-draft Chinese writing at the very beginning, Daniel’s negative attitudes and his different views on teachers’ feedback, and the changes of his attitudes and views.

Daniel was not clear about the purposes of online indirect coded WCF and the multiple-draft Chinese writing. Daniel had only one WS error in the first draft of the first writing assignment but eight WS errors in the first draft of the second writing assignment. In the interview, the researcher tried to find out the reasons. After Daniel submitted the second draft of the first writing assignment, the researcher interviewed Daniel. Daniel explained that he thought accuracy was the most important part of Chinese writing, so he tried to use familiar words.

Daniel: “I focused on accuracy; it could help you (teachers) to understand what I am trying to say. I used some sentence patterns in my previous writing assignments, which makes me feel like I can write confidently”. (Answered in Chinese, translated into English) (1st-interview).

Daniel’s negative attitudes and his different views toward indirect feedback had a certain impact on the revision efforts. In the first revision, Daniel received 57 points. In the first interview, Daniel complained about using this approach in the Chinese class.

Daniel: “Probably one hour, I think I should spend more time on it, but I think if the teacher helps me to correct errors, it is more helpful. I did not know how to correct; I need to talk to a professor. I think the professor should tell me how to revise this.” (Answered in Chinese, translated into English) (1st-interview).

According to Daniel’s responses in the third and fourth interviews, in the process of careful revision, he gradually realized that he could learn a lot in this process. In the fourth interview, Daniel explained his changing attitudes and views in detail.

Daniel: “I think if you correct the error, I did not know why I made the error; I just
complete the assignment. I think it is really a practice though, I can go back to edit it, because getting the grade, and then seeing what we did wrong, I feel it’s better to fix it and see if we fixed it properly, I think it’s worth the time, definitely worth the time.” (4th-interview).

In sum, Daniel’s case showed that he might not be clear about the purposes of the online indirect coded WCF and the multiple-draft Chinese writing. In addition, his negative attitudes and views may have lead him to ignore some errors and refuse to correct them. Students’ attitudes and views could be changed in the process of learning. In addition, Daniel also indicated that the development of revision skills influenced his revisions.

Martha

Martha was a senior undergraduate student majoring in International Studies. Martha was an international student from Colombia. Her native language was Spanish. Martha had native or near-native proficiency in English. Martha had passed first-year Chinese courses, second-year Chinese courses, and one third-year Chinese course. Martha participated in the study-abroad summer intensive program in the Chinese program. Martha aimed to teach English as a foreign language in China after she achieved her bachelor’s degree. She wanted to improve her listening, speaking, reading, writing, and communication abilities in Chinese in order to be more competitive in the job market in China and have better interactive communication with her future students and colleagues. Martha’s Chinese language proficiency level was intermediate-low in terms of ACTFL proficiency guidelines.

Martha’s Revision Scores

Table 25 shows Martha’s revision scores.
In the first draft of the first writing assignment, the teacher and the grader provided 25 error feedback points to Martha. In the second draft of the first writing assignment, Martha did not attempt to revise three WS errors, two VCO errors, two MGC errors, and three MW
errors. One VO error and one VCO error were revised with negative effects. One WS error and one MW error were revised with positive and negative mixed effects. Six WS errors, one IC error, one VCO error, one WO error, and two MW errors were revised with positive effects.

Examples (more examples will be discussed in the cross-case analysis):

* 因为他们已经认识别父母 “Because they already know other patents” (1st-draft, WS error).

No change: 因为他们已经认识别父母 “Because they already know other patents” (1st-draft, WS error).

* 如果找别人有他们孩子的个性一样以后没问题 “If looking for someone else had the same personality as their child no problem later” (1st-draft, VCO error).

Negative effect: 如果找的人和孩子是一样的个性以后没问题 “If looking for someone had the same personality as their child no problem later” (2nd-draft).

* 在都文化中，父母想让孩子先毕业再结婚 “In both cultures, patents want their children to graduate first and then get married” (1st-draft, WS error).

Mixed effects: 在两文化中，父母想让孩子先毕业再结婚 “In both cultures, patents want their children to graduate first and then get married” (2nd-draft).

* 在中国，父母觉得他们知道年轻人的味道 “In China, patents feel that they know the taste of young people” (1st-draft, WS error).

Positive effect: 在中国，父母觉得他们知道年轻人喜欢什么人 “In China, parents feel that they know who young people like” (2nd-draft).

In the first draft of the second writing assignment, the teacher and the grader provided 17 error feedback points to Martha. In the second draft of the second writing assignment, one IC error and one MGC error were not revised at all. Two WS errors, one IC error, one WO
error, and one SVO error were revised with positive and negative mixed effects. One WS error, one IC error, two VCO errors, four MW errors, and two MGC errors were revised with positive effects.

In the first draft of the third writing assignment, the teacher and the grader provided 15 error feedback points to Martha. In the second draft of the third writing assignment, Martha did not attempt to revise one MGC error. One VO error was revised with negative effects. One MW error was revised with positive and negative mixed effects. Four WS errors, three VCO errors, four MGC errors, and one WO error were revised with positive effects.

In the first draft of the fourth writing assignment, the teacher and the grader provided eight error feedback points to Martha. In the second draft of the fourth writing assignment, one WS error and one MGC error were not revised at all. Two WS errors, two VCO errors, and two MW errors were revised with positive effects.

The revision rating scores of the four writing assignments were 59, 78, 87, and 75 (Shown as Figure 15). The first revision score was relatively low: there was a noticeable improvement since the second writing assignment. The revision scores of the last three writing assignments were kept stable; that is, Martha could revise the errors effectively since the second writing assignment. Martha ignored most WS errors, MGC errors, and MW errors in the first writing assignment, and Martha could not revise VCO errors and WO errors successfully in the first writing assignment. However, since the second writing assignment, Martha could revise most WS errors correctly, and most of SVO errors, IC errors, MW errors, and WO errors were revised with positive effects. Figure 15 shows a tendency line for Martha’s revision scores.
Figure 15. A Tendency Line for Martha’s Revision Scores.

Martha: the Characteristics and Distribution of Errors

Table 26 displays Martha’s error numbers and percentages in the first draft of each writing assignment.
Table 26. Martha’s Errors in the First Draft of Each Writing Assignment.

<table>
<thead>
<tr>
<th>Martha</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Errors</td>
<td>25</td>
<td>17</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Word substitution (WS)</td>
<td>10 (40%)</td>
<td>3 (17.65%)</td>
<td>4 (26.67%)</td>
<td>3 (37.5%)</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td>1 (4%)</td>
<td>3 (17.65%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td>1 (4%)</td>
<td></td>
<td>1 (6.67%)</td>
<td></td>
</tr>
<tr>
<td>Verb complement object</td>
<td>4 (16%)</td>
<td>2 (11.76%)</td>
<td>3 (20%)</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>(VO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td>1 (5.88%)</td>
<td></td>
</tr>
<tr>
<td>Missing grammatical</td>
<td>2 (8%)</td>
<td>3 (17.65%)</td>
<td>5 (33.33%)</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>components (MGC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word order (WO)</td>
<td>1 (4%)</td>
<td>1 (5.88%)</td>
<td>1 (6.67%)</td>
<td></td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>6 (24%)</td>
<td>4 (23.53%)</td>
<td>1 (6.67%)</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 16 shows a tendency line for Martha’s errors in the first draft of each writing assignment and revision scores.
Figure 16. A tendency line for Martha’s errors in the first draft of each writing assignment.

In the first draft of the first writing assignment, Martha produced 327 Chinese characters, the teacher and the grader provided 25 error feedback points to Martha, including ten WS errors, two MGC errors, one IC error, six MW errors, four VCO errors, one VO error, and one WO error. In the first draft of the second writing assignment, Martha produced 310 Chinese characters, the teacher and the grader provided 17 error feedback points to Martha, including three MGC errors, four MW errors, one WO error, three WS errors, two VCO errors, three IC errors, and one SVO error. In the first draft of the third writing assignment, Martha produced 314 Chinese characters, the teacher and the grader provided 15 error feedback points to Martha, including five MGC errors, four WS errors, three VCO errors, one VO error, one WO error, and one MW error. In the first draft of the fourth writing assignments, Martha produced 324 Chinese characters, the teacher and the grader provided eight error feedback points to Martha, including two VCO errors, three WS errors, two MW errors, and one MGC error.
The total number of errors also showed a decreasing trend: 25, 17, 15, and 8, respectively. The types and characteristics of Martha’s errors were obviously different from other participants’ error types. Martha’s error types included WS, IC, VO, VCO, SVO, MGC, WO, and MW. Martha had a large number of long sentences, and many VCO errors compared with other participants.

**Martha’s Views of the Computer-Mediate Coded WCF?**

Table 27 displays Martha’s response to the surveys. The researcher also used interview data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 27.** Martha’s Views on the Computer-mediated Coded WCF.

<table>
<thead>
<tr>
<th>Martha</th>
<th>1st-survey</th>
<th>2nd-survey</th>
<th>3rd-survey</th>
<th>4th-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ feedback</td>
<td>Very important.</td>
<td>Very important.</td>
<td>Very important.</td>
<td>Very important.</td>
</tr>
<tr>
<td>Online-writing interface</td>
<td>Neutral.</td>
<td>Neutral.</td>
<td>Easy to use.</td>
<td>Easy to use</td>
</tr>
<tr>
<td>CMS navigate</td>
<td>Neutral.</td>
<td>Neutral.</td>
<td>Easy to use</td>
<td>Easy to use</td>
</tr>
</tbody>
</table>

Compared to Paul and Daniel, Martha had relatively positive attitudes and views towards the computer-mediated coded WCF. In the first two surveys, Martha thought it was
not easy to understand the error codes, but in the third and fourth surveys, she was getting familiar with the error codes and said it was easy to understand the error codes. When asked “how do you feel about coded error corrections?” and “how do you feel about the computer-mediated error corrections?”, Martha revealed a positive attitude in the first survey, but she only thought it was “somewhat useful” because it took a lot of time. In the second survey, Martha answered that coded error corrections and the computer-mediated error correction were useful and helpful, because she found that she could develop some strategies and skills to correct errors, but she commented that she did not revise some types of errors by herself.

Regarding the online writing feedback system, she said she was familiar with the Canvas learning management system; thus, she mentioned that it was neither easy nor difficult to use the website in the first survey and the second survey. After the third writing assignment, Martha said although the website was slightly different from Canvas, she was getting familiar with the website; thus, she said it was easy to use in the third survey and the fourth survey. When asked about the interface and navigation of the website, she answered that it was “neutral” in the first survey and the second survey, but in the third and fourth surveys, Martha mentioned that it was easy to use. In the first three surveys, Martha believed that the statistical function was very useful. In the fourth survey, she suggested that she wanted to see the statistical data on her revision changes rather than on her error number changes.

**What Factors Influenced Martha’s Incorporation of Feedback?**

Regarding what factors influenced students’ incorporation of teacher feedback in their writing, four factors impacted Martha’s revisions, including influence of her native language, error types, proficiency level, and the relationship between teachers’ WCF and Martha’s original meanings.

In this study, five student participants rarely had VCO, SVO, or VO errors. Martha
showed a special case: she used more complex and longer sentences compared with the other five student participants, and she made a great number of VCO and VO errors. The researcher noticed the special case and asked her about the reasons. Martha responded she was thinking in her native language when writing in Chinese in her second interview. In her third and fourth interviews, her responses showed consistency regarding the reasons she wrote long and complex sentences.

Martha: “I am an international student, I am from Colombia, I speak Spanish, sometimes, when I am writing the homework, uh…uh…I am thinking of Spanish, and I write it in Chinese……. When I am revising errors, I am also thinking of my native language.”

(Answered in Chinese, translated into English) (2nd-interview).

Other research sheds lights on the influence of Martha’s native language on her Chinese writing and revision. Some studies (e.g., Haan & Esch, 2005; Norment, 1984) reported that Spanish native speakers produced long sentences. Haan and Esch (2005) indicated that Spanish writers produce the longest sentences among writers using various languages at the advanced level. Norment (1984) reported that Spanish ESL learners produced more sentences, and they used more cohesive devices than writers in other languages in writing narrative essays.

Regarding the VCO and VO errors, the above table shows that Martha did not correct the errors very well in the first three writing assignments. When the researcher discussed revising VCO and VO errors in the third interview with Martha, Martha told the researcher that she thought it was too difficult for her to correct sentence structures by herself in her Chinese proficiency level.

Martha: “The hardest part was figuring out how to change this (pointed to VCO errors). It was long, while also still making sense if I can make a really long sentence. I tried to search some information to help me correct it, but I messed up, I think right now I do not
have the abilities to correct this type of errors on my own.” (2nd-interview).

Martha chose not to correct three WS errors in the second draft of the first writing assignment. In the first interview, the researcher asked why Martha did not correct the three WS errors. Regarding some WS errors, Martha insisted that what she had written was correct. Martha explained that the words she used could express what she wanted to say, and the teacher might have misunderstood her real meaning. In the first interview, Martha responded to this issue.

Martha: “I just think the teacher might not know what I am trying to say, what I am trying to express, the teacher did not understand this. I do not want to use another word, I think it is right, sometimes I use this kind of words when I communicate with my Chinese friends, they told me it is cool, and it is Okay.” (Answered in Chinese, translated into English) (1st-interview).

After the first interview, the researcher explained that it was inappropriate to use such words to express feeling in formal Chinese writing at the college level. The researcher suggested that Martha could find other proper words to express her strong emotions. Since the second draft of the second writing assignments, Martha revised most of their WS errors.

Martha also indicated that her unfamiliarity with the computer-mediated WCF influenced her revisions.

Martha: Sometimes, I do not remember which color (error codes) they were. (2nd-interview).

In sum, Martha mentioned that when she was thinking in her native language to write Chinese, she would write long and complex sentences. This is a special case compared to the other five student participants. Martha indicated that she lacked some abilities to correct certain types of errors. Martha emphasized that if she believed teachers’ WCF violated her original meanings and the feelings she wanted to express, she would refuse to revise the
errors. Martha’s unfamiliarity with the computer-mediated WCF and the development of revision skills were other factors influencing her revision.

Rachel

Rachel was born and raised in Canada, and she spoke English and Spanish. Rachel was a senior undergraduate student majoring in Biology. Rachel enrolled in first-year Chinese courses to fulfill the university’s foreign language requirements. Rachel told the researcher that she chose Chinese as her foreign language because she realized that many Chinese native speakers work in the field of biology in the U.S.; she would have better communication with her co-workers in biology labs if she could speak Chinese. After she completed the first-year Chinese courses, she noticed that it was very useful to learn Chinese and speak Chinese with her co-workers in the biology lab. She aimed to find a job in the field of biology after she achieved her bachelor’s degree, and she thought speaking Chinese would help her to communicate with co-workers and might facilitate more promotion opportunities in the future. She completed the second-year Chinese courses, and she enrolled in third-year Chinese courses. She also participated in the summer intensive study-abroad program in China in the Chinese program. Martha and Rachel were very close friends: the researcher often saw them together to practice Chinese and learn Chinese in the Chinese Language and Culture Center, which was designed for learners of Chinese to communicate with Chinese native speakers who were international students originally from China. Rachel’s Chinese language proficiency level was intermediate-low in terms of ACTFL proficiency guidelines.

Rachel’s Revision Scores

Table 28 shows Rachel’s revision scores.
Table 28. Rachel’s Revision Rating Form.

<table>
<thead>
<tr>
<th>Rachel.</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>WS<em>3, VO</em>2, MGC<em>2, VCO</em>2</td>
<td>WS<em>1, VCO</em>1, MGC<em>7, MW</em>1</td>
<td>MGC*3</td>
<td></td>
</tr>
<tr>
<td>Change, Effect negative</td>
<td>WS<em>3, VCO</em>1, WO*1</td>
<td></td>
<td></td>
<td>WS<em>2, MGC</em>1, WO*1</td>
</tr>
<tr>
<td>Change, Effect mixed</td>
<td>VCO*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change, Effect positive</td>
<td>WS<em>3, WO</em>1, MW*1</td>
<td>WS<em>2, WO</em>1, MW*2</td>
<td>WS<em>8, WO</em>1, MW*1</td>
<td>WS<em>3, MW</em>2, VCO<em>2, MGC</em>4</td>
</tr>
<tr>
<td>Score</td>
<td>15</td>
<td>22</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>% score</td>
<td>36/100</td>
<td>35/100</td>
<td>77/100</td>
<td>82/100</td>
</tr>
</tbody>
</table>

Notes: WS=word substitution, IC=incorrect chunks, VO=verb object, VCO=verb complement object, SVO=subject verb object order, MGC=missing grammatical components, WO=word order, SC=sentence connector, MW=missing word, WP=wrong preposition, SL=spoken language.

In the first draft of the first writing assignment, the teacher and the grader provided 14 error feedback points to Rachel. In the second draft of the first writing assignment, three WS errors, two VO errors, two MGC errors, and two VCO errors were not revised at all. Three WS errors, one WO error, and one MW error were revised with positive effects.

Examples (more examples will be discussed in the cross-case analysis):

- *他们肯定不选他们孩子的婚姻 “They definitely do not choose their child’s
marriage” (1st-draft, WO error).

No change: 他们肯定不选他们孩子的婚姻 “They definitely do not choose their child’s marriage” (2nd-draft).

• *向大禹一样勤奋做 “Work diligently like Dayu” (1st-draft, WS error).

Negative effect: 向大禹一样勤奋做工作 “Work diligently like Dayu” (2nd-draft).

• *这个故事有很棒的士气 “This story has great moral” (1st-draft, VCO error).

Mixed effects: 这个故事有很好用的教训 “This story has a very useful lesson” (2nd-draft).

• *他的孩子好多次… “His children many times…” (1st-draft, WS error).

Positive effect: 他的孩子好多次… “His children many times…” (2nd-draft).

In the first draft of the second writing assignment, the teacher and the grader provided 21 error feedback points to Rachel. In the second draft of the second writing assignment, Rachel did not attempt to revise one WS error, one VCO error, seven MGC errors, and one MW error. Three WS errors, one VCO error, and one WO error were revised with negative effects. One VCO error was revised with positive and negative mixed effects. Two WS errors, one WO error, and two MW errors were revised with positive effects.

In the first draft of the third writing assignment, the teacher and the grader provided 13 error feedback points to Rachel. In the second draft of the third writing assignment, all three MGC errors were not revised at all. Rachel successfully revised all eight WS errors, one WO error, and one MW error.

In the first draft of the fourth writing assignment, the teacher and the grader provided 15 error feedback points to Rachel. In the second draft of the fourth writing assignment, Rachel attempted to revise all the errors. Two WS errors, one MGC error, and one WO error were revised with negative effects. Three WS errors, two MW errors, two VCO errors, and
four MGC errors were revised with positive effects.

The four revision scores were 36, 35, 77, and 82 (shown as Figure 17). Rachel’s revision scores showed an increasing trend. The first two revision scores were relatively low: Rachel failed to correct the WS errors and MGC errors. Since the third writing assignment, Rachel was able to revise WS errors, WO errors, and MW errors effectively; however, most of the VCO errors, VO errors, and MGC errors were revised with negative effects.

![Graph showing Rachel's revision scores](image)

**Figure 17.** A tendency line for Rachel’s revision scores.

**Rachel: the Characteristics and Distribution of Errors**

Table 29 displays Rachel’s error numbers and percentages in the first draft of each writing assignment.
Table 29. Rachel’s Errors in the First Draft of Each Writing Assignment.

<table>
<thead>
<tr>
<th>Rachel.</th>
<th>1st-writing</th>
<th>2nd-writing</th>
<th>3rd-writing</th>
<th>4th-writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Errors</td>
<td>14</td>
<td>21</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Word substitution (WS)</td>
<td>6 (42.86%)</td>
<td>6 (28.57%)</td>
<td>8 (61.54%)</td>
<td>5 (33.33%)</td>
</tr>
<tr>
<td>Incorrect chunks (IC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb object (VO)</td>
<td>2 (14.29%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb complement object (VCO)</td>
<td>2 (14.29%)</td>
<td>3 (14.29%)</td>
<td></td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td>SVO order (SVO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing grammatical components (MGC)</td>
<td>2 (14.29%)</td>
<td>7 (33.33%)</td>
<td>3 (23.08%)</td>
<td>5 (33.33%)</td>
</tr>
<tr>
<td>Word order (WO)</td>
<td>1 (7.14%)</td>
<td>2 (9.52%)</td>
<td>1 (7.69%)</td>
<td>1 (6.67%)</td>
</tr>
<tr>
<td>Sentence connector (SC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing word (MW)</td>
<td>1 (7.14%)</td>
<td>3 (14.29%)</td>
<td>1 (7.69%)</td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td>Wrong preposition (WP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spoken language (SL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 18 shows a tendency line for Rachel’s errors in the first draft of each writing assignment and revision scores.
Figure 18. A tendency line for Rachel’s errors in the first draft of each writing assignment.

The total number of errors showed a dynamic trend: 14, 21, 13, and 15. In the first draft of the first writing assignment, Rachel produced 289 Chinese characters, the teacher and the grader provided 14 error feedback points to Rachel, including two MGC errors, one MW error, six WS errors, two VCO errors, two VO errors, and one WO error. In the first draft of the second writing assignment, Rachel produced 308 Chinese characters, the teacher and the grader provided 21 error feedback points to Rachel, including seven MGC errors, three MW errors, two WO errors, six WS errors, and three VCO errors. In the first draft of the third writing assignment, Rachel produced 304 Chinese characters, the teacher and the grader provided 13 error feedback points to Rachel, including three MGC errors, eight WS errors, one MW error, and one WO error. In the first draft of the fourth writing assignment, Rachel produced 319 Chinese characters, the teacher and the grader provided 15 error feedback points to Rachel, including five MGC errors, five WS errors, one WO error, two VCO errors, and two MW errors. The total amount of errors in the four writing assignments were 14, 21,
13, and 15. The error types mainly included MGC, MW, WS, WO, VCO, and VO, which were similar to Martha’s error types.

**Rachel’s Views of the Computer-Mediate Coded WCF?**

Table 30 displays Rachel’s response to the surveys. The researcher also used interview data to explain and support students’ responses on the computer-mediated coded WCF.

**Table 30. Rachel’s Views on the Computer-mediated Coded WCF.**

<table>
<thead>
<tr>
<th>Rachel</th>
<th>1st-survey</th>
<th>2nd-survey</th>
<th>3rd-survey</th>
<th>4th-survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ feedback</td>
<td>Very important.</td>
<td>Very important.</td>
<td>Very important.</td>
<td>Very important.</td>
</tr>
<tr>
<td>Online-writing interface</td>
<td>Neutral</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
</tr>
<tr>
<td>CMS navigations</td>
<td>Neutral.</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
<td>Easy to use.</td>
</tr>
</tbody>
</table>
Rachel had similar changing trends of attitudes and views as Martha on online coded WCF. Based on Rachel’s survey table above, she indicated it was not easy to understand the error codes, but since the teacher explained the error codes in the course orientation, she said it was not very difficult to understand the error codes. After the second writing assignment, she said it was easy to understand the error codes. When asked “how do you feel about the coded error corrections?” and “how do you feel about the computer-mediated coded WCF?” in the first survey, Rachel said it was somewhat helpful, because the codes helped her to notice her errors. In all three of the remaining surveys, she said that it was very useful and helpful, because she could develop learning strategies and find useful learning tools in the process of correcting errors.

Regarding the online writing feedback system, Rachel mentioned that it was easy to use, since the online feedback system was designed in Canvas and she was familiar with Canvas. Rachel also mentioned that if a user were familiar with another learning management system, such as Blackboard, it might take the user more time to get to know the online feedback system. When asked about the interface and navigation of the website, Rachel answered “neutral” in the first survey. Rachel said it was easy to use in the second, third, and fourth survey. When asked about the statistical function, Rachel said it was very useful in the first survey and the second survey, because the statistical function could track her errors. However, in the later surveys, her views on the function changed: Rachel said the function was actually useless because she could not see how her errors were increasing or decreasing from one assignment to the next.

**What Factors Influenced Rachel’s Incorporation of Feedback?**

Regarding what factors influenced students’ incorporation of teacher feedback in their writing, three factors impacted Rachel’s revisions, including error types, proficiency level, and the relationship between teachers’ WCF and Rachel’s original meanings.
When the researcher discussed revising VCO and VO errors in the third interview with Martha, Martha told the researcher that she thought it was too difficult for her to correct sentence structures by herself at her Chinese proficiency level. Rachel also expressed the same concerns in her second interview and third interview.

Rachel: “I know that definitely in speaking (pointed to VCO errors), I mess up like, in the order, order, it sounds weird, so it takes me a while to, sometimes, switch back. I re-organize to see if it works, no, it doesn’t, I think I need to ask a professor to correct the error. I need some support.” (2nd-interview).

Rachel also chose not to correct three WS errors in the second draft of the first writing assignment. In her first interview, the researcher asked why Rachel did not correct the three WS errors. Rachel emphasized that she did not “ignore” the WS errors: she noticed that the teacher circled the three words, but she did not think the three words she used were incorrect. Regarding some WS errors, Rachel insisted that what she had written was correct. For example, Rachel used the word 该死 "damn" in the first draft of the second writing assignment. The teacher and the grader agreed that it was not appropriate to use such a word in a college-level writing assignment. Rachel insisted that the word could express her anger regarding the unequal marriage relationships in rural areas in China. Rachel responded that she did not really think the word 该死 "damn" was an error, she was very angry about Chuncao’s (a character in the textbook) parents because they supported the unfair marriage, and Rachel was trying to use the word 该死 "damn" to express her emotions. In the first interview, Rachel responded to this issue. After the first interview, the researcher explained that it was inappropriate to use such words to express feeling in formal Chinese writing at the college level. The researcher suggested that Rachel could find other proper words to express her strong emotions. Since the second draft of the second writing assignments, Rachel revised most of their WS errors.
Rachel: “I do not really think it was an error; I am very angry about Chuncao’s (a character in the textbook) parents, uh, uh, the marriage is unfair, I think I was trying to use this word 该死 (damn) to express my emotions. Why it is wrong? I used this word for the unfair relationships, not for Chuncao’s parents.” (Answered in Chinese, translated into English) (1st-interview).

In addition, Rachel also indicated unfamiliarity was a factor:

Rachel: I did not quite know, sometimes, you put a green check mark, I think, if I remember correctly, no, what did you put, it was blue, I think it meant I did not have a word, but I did not realize it meant that I need a space. So, that one, I think you had the same thing here, what would I do? I did not realize it meant I need a space, I did not understand that marking. (1st-interview).

In sum, Rachel discussed her lack of some abilities to correct certain types of errors: she indicated that she might be able to correct these errors (e.g., WO, VCO, and VO) when she achieved advanced-mid Chinese language proficiency level. Rachel also indicated that if she thought teachers’ WCF on WS errors violated her beliefs, she did not ignore the WS errors; instead, she refused to revise the WS errors. In addition, unfamiliarity with the online computer-mediated coded WCF and the development of her revision skills were the third factor and the fourth factor.
CHAPTER FIVE:
RESULTS OF CROSS-CASE ANALYSIS

In the section of cross-case analysis, the study aimed to find patterns and trends among these six student participants. The cross-case analysis also intended to preserve the richness and uniqueness of the six single cases by building meaningful linkages and relationship among the six student participants. The cross-case analysis applied case-oriented approaches. Khan and VanWynsberghe (2008) discussed the advantages of case-oriented approaches in cross-case analysis: “This approach can show how a story unfolded in different cases, how researchers can make sense of the original case, or suggest new typologies, classes or families of a social phenomenon” (Khan & VanWynsberghe, 2008, p. 10). To present the results of cross-case analysis, the chapter applies a question-oriented approach. This chapter reveals research findings by answering the four research questions. The results of cross-case analysis are consistently discussed with reference to the revision scores, the characteristics and distribution of errors, four surveys, and four interviews.

To Answer Research Question One

The first research question asked, “How do students respond to the teachers indirect, coded, and computer-mediated WCF in their writing?” This question was answered through examining data focusing on the status and characteristics of the participants' revisions. The following tables provide the scores on the participants' revisions, based on the rating scale for revisions. The total revision scores of the four writing assignments were 107, 150, 217, and 151. It revealed a downward trend. This was because the total number of revisions of each participant was different each time, so their total scores were different, which affected the
accuracy of the revision characteristics. For example, in the fourth writing assignment, the numbers of errors made by the participants have decreased significantly, and the numbers of errors needing to be corrected also declined. In the process of data analysis, the researcher converted the scores into percentage, which could more accurately reflect the characteristics of the students' revisions. The following table includes the scores converted into percentages (shown as Table 31, Figure 19, and Figure 20).

**Revision Rating Scores**

As the numbers of participants' errors would impact the scores (the numbers of students' errors would lead to different total scores each time.), in this study, the scores were converted into percentages, which would more accurately show the changes of students' revisions. Table 31 shows the revision scores (percentages).

<table>
<thead>
<tr>
<th></th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ben</td>
<td>38</td>
<td>70</td>
<td>86</td>
<td>55</td>
</tr>
<tr>
<td>Mary</td>
<td>59</td>
<td>50</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td>Paul</td>
<td>5</td>
<td>31</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>Daniel</td>
<td>57</td>
<td>54</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td>Martha</td>
<td>59</td>
<td>78</td>
<td>87</td>
<td>75</td>
</tr>
<tr>
<td>Rachel</td>
<td>36</td>
<td>35</td>
<td>77</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>254</td>
<td>318</td>
<td>509</td>
<td>492</td>
</tr>
</tbody>
</table>

Figure 19 shows a tendency line for the four total revision scores of the four writing assignments.
Figure 19. A tendency line for revision scores (total).

Figure 20 shows a tendency line for each student’s total revision scores of the four writing assignments.
Figure 19 and Figure 20 show that student participants generally had lower scores in the revision of the first assignment. The situation improved in the revision of the second assignment, and the revision scores obviously increased in the revision of the third assignment and the revision of the fourth assignment, which suggested that student participants could effectively revise errors. It is also important to examine which errors student participants could correctly revise and which errors were difficult for them to correct. The top four types of errors students made were WS, MW, IC and MGC errors, so the following section will mainly discuss these four types of errors in terms of the student participants' revisions. There were few VCO and VO errors, and they only occurred in some individual participants; therefore, these errors would be explained and discussed in the interview data analysis.
According to the data in Table 31, the revision scores of the four drafts were 254, 318, 509, and 492, respectively. The scores of the second-draft of the second writing assignment were higher than those of the second-draft of the first writing assignment; the scores of the second-draft of the third writing assignment were much better; the scores of the second-draft of the fourth writing assignment were basically the same as the third writing assignment. In terms of the revision scores of the four writing assignments, the revision effect was evident. Student participants could quickly start effective revision; therefore, based on the data analysis, the results indicated that the learners could make the revision independently, and through some practice, the effectiveness of the participants' revisions would be improved.

For vocabulary and phrase errors, the effect of student participants' revision was evident. The positive-effect revision rates of WS errors were 38%, 44%, 90%, and 77%, in the four writing assignments, respectively. The positive-effect revision rates of IC errors were 44%, 31%, 78%, and 70% in the four writing assignments, respectively. The positive-effect revision rate of MGC errors were 36%, 26%, 50%, and 80%. The positive-effect revision rates of MW errors were 39%, 47%, 87%, and 100%. Although the total number of errors did not change significantly over the first drafts of the four writing assignments, the success rates of revision increased.

In this research setting, five student participants' native language was English, and one student participant's (Martha) native language was Spanish. The student participant whose native language was Spanish showed different characteristics from other student participants in making mistakes. Many sentence structure errors such as SVO and VCO errors were found in this participant’s four writing assignments as the student participant used many long and complex sentences. The numbers of SVO and VCO errors were far more than those of the other student participants. Data from her interviews presented in the last chapter indicated that native language had a certain impact on the student participants' error types.
Martha said that she was not capable of modifying errors such as VCO and WO errors. In order to examine research question 1 in depth, the researcher examined the participants’ revisions on different types of errors.

**WS Errors**

Table 32 presents data showing the characteristics of participants' revision of WS errors.

**Table 32. Characteristics of Participants’ Revision of WS Errors.**

<table>
<thead>
<tr>
<th>WS</th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>42%</td>
<td>15%</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>Negative effect</td>
<td>13%</td>
<td>30%</td>
<td>2%</td>
<td>15%</td>
</tr>
<tr>
<td>Mixed effect</td>
<td>8%</td>
<td>11%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Positive effect</td>
<td>38%</td>
<td>44%</td>
<td>90%</td>
<td>77%</td>
</tr>
</tbody>
</table>

Figure 21 shows a tendency line for the characteristics of participants’ revision of WS errors.

**Figure 21.** A tendency line for the characteristics of participants’ revision of WS errors.
The data revealed that the success rate of revising WS errors was high, but the WS-error rates in the four writing assignments were still very high, which suggested that WS errors can be revised effectively, however, since students may use different vocabulary items in different essays, they may produce errors with words they did not use in earlier writing. This may explain the error rates across the four essays. The data also revealed that student participants were able to correct the WS errors much more effectively in the last two writing assignments. Based on the following examples, the data revealed what types of WS errors learners could correct, and what types of WS errors learners failed to correct.

e.g., Positive effects

* ‘Immediately’ ----- ‘Since’ (Ben, 2nd-draft, 3rd writing assignment).

* ‘Look at his wife or son’ ----- ‘Look at his wife and son’ (Daniel, 2nd-draft, 3rd writing assignment).

* ‘Life will transfer us’ ----- ‘Life will change us’ (Rachel, 2nd-draft, 4th writing assignment).

* ‘Will not move the mountain away’ ----- ‘Can’t move the mountain away’ (Martha, 2nd-draft, 2nd-writing assignment).

e.g., Negative effects

* ‘I only promote the wrong information’ ----- ‘I only spread the wrong information’ (Paul, 2nd-draft, 4th writing assignment).

* ‘Mao Kong and Ai Zi’ ----- ‘Mao Kong to Ai Zi’ (Rachel, 2nd-draft, 4th writing assignment).

Based on the above examples, student participants had a high success rate in correcting errors of word choice in nouns, adjectives and conjunctions, but the success rate in
correcting verbs and prepositions was relatively low.

**IC Errors**

Table 33 shows us the characteristics of student participants' IC-error modifications.

**Table 33. Characteristics of Participants’ Revision of IC Errors.**

<table>
<thead>
<tr>
<th>IC</th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>0%</td>
<td>31%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Negative effect</td>
<td>33%</td>
<td>25%</td>
<td>11%</td>
<td>20%</td>
</tr>
<tr>
<td>Mixed effect</td>
<td>22%</td>
<td>13%</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>Positive effect</td>
<td>44%</td>
<td>31%</td>
<td>78%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Figure 22 shows a tendency line for the characteristics of participants’ revision of IC errors.

![Figure 22. A tendency line for the characteristics of participants’ revision of IC errors.](image)

According to the data, the situation of IC errors was more complex. Although participants could gradually revise IC errors correctly, they would continue to make mistakes in the following writing assignments. During the data analysis, the researcher found that the
type of IC errors was too broad as it included many types of errors in terms of word collocation and variations. For example, IC errors included mismatched prepositional phrases, adjectives and nouns mismatched, verb and object mismatched, adverb and verb mismatched, and so forth. Therefore, IC errors were complicated. Student participants did not respond to IC errors successfully in the first and second revisions, but by the third and fourth revisions, there had been notable progress (because student participants found a strategy to correct IC errors). The data analysis of interviews would further discuss the reasons.

**MGC Errors**

Table 34 shows the characteristics of participants' MGC-error modifications.

**Table 34. Characteristics of Participants’ revision of MGC Errors.**

<table>
<thead>
<tr>
<th>MGC</th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>69%</td>
<td>74%</td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>Negative effect</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Mixed effect</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Positive effect</td>
<td>31%</td>
<td>26%</td>
<td>50%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Figure 23 shows a tendency line for the characteristics of participants’ revision of MGC errors.
Figure 23. A tendency line for the characteristics of participants’ revision of MGC errors.

Data analysis revealed that MGC revisions were mainly distributed in the two categories: no changes and changes with positive effects, and there were no changes with negative effects or changes with positive/negative mixed effects. To put it simply, student participants either did not change, or if they did change, they could successfully correct them. MGC errors occurred mainly in incorrect use of punctuation, spaces, measure words, and prepositional phrases. For punctuation errors, student participants were able to correct them quickly. For format errors, student participants did not know how to revise them when the
teacher provided indirect coded WCF, and they said they did not know where they could find information to correct the errors. However, student participants could correct such errors after discussions with the teacher. Some student participants did not even realize the errors until they had their interviews with the researcher. However, once student participants corrected these errors, they would hardly ever repeat such errors in the following writing assignments. Although they might occur again, the number would be much less. For the punctuation errors, such as:

- *在中国你的父母 (In China your parents)------在中国，你的父母 (In China, your parents). (Rachel, 2nd-draft, 4th writing assignment).
- *你可以有很好的生活但是 (You can have a good life but)------你可以有很好的生活，但是 (You can have a good life, but). (Daniel, 2nd-draft, 3rd writing assignment).
- *这个故事很有道理因为告诉人们 (This story makes sense because it tells people) ------这个故事很有道理，因为告诉人们 (This story makes sense, because it tells people). (Martha, 2nd-draft, 3rd writing assignment).

**MW Errors**

Table 35 shows us the characteristics of participants' MW-error modification.

**Table 35. Characteristics of Participants’ Revision of MW Errors.**

<table>
<thead>
<tr>
<th>MW</th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>33%</td>
<td>27%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Negative effect</td>
<td>28%</td>
<td>20%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Mixed effect</td>
<td>0%</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>Positive effect</td>
<td>39%</td>
<td>47%</td>
<td>87%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 24 shows a tendency line for the characteristics of participants’ revision of MW errors.

**Figure 24.** A tendency line for the characteristics of participants’ revision of MW errors.

Examples demonstrating revision of errors (the following errors were from the second-draft of the first writing assignment):

- missing “是” (e.g., *这个故事对我的启发 “This story inspired me”, Mary, 2nd-draft, 3rd writing assignment).
missing “的” (e.g., 因为别人的见识是很重要 “Because the knowledge of others is very important”, Mary, 2nd-draft, 3rd writing assignment).

missing quantifier (e.g., *跟人们一起想了一办法 “Think of a way with people”, Mary, 2nd-draft, 3rd writing assignment; *就让两大力神把山移开 “Let the two Hercules move the mountain away”, Daniel, 2nd-draft, 2nd writing assignment; *婚姻是重要的事情 “Marriage is important thing”, Daniel, 2nd-draft, 1st writing assignment; *因为这两大山非常高 “Because these two mountains are very high”, Rachel, 2nd-draft, 2nd writing assignment),

missing pronoun (e.g., *大禹就从父亲接受了治水工作 “Da Yu accepted the water control work from his father”, Ben, 2nd-draft, 3rd writing assignment; *他觉得（这样）非常不方便 “He feels very inconvenient”, Daniel, 2nd-draft, 3rd writing assignment). 

missing cohesive devices/adverbs (e.g., *如果孩子不同意，他们找别的人 “If the child does not agree, they look for someone else”, Martha, 2nd-draft, 1st writing assignment; *我很快毕业了“I graduated very quickly”, Martha, 2nd-draft, 2nd writing assignment; *因为人们不能治水,（所以）房子塌了 “Because people can't control the water, so the house collapses”, Ben, 2nd-draft, 3rd writing assignment; *不要一开始相信 “Do not believe at first”, Rachel, 2nd-draft, 4th writing assignment).

used monosyllabic words to replace two-syllable words in formal writing assignments (e.g., *我认为跟中国婚姻（相）比 “I think that compared with the concept of Chinese marriage”, Mary, 2nd-draft, 1st writing assignment; *中国发（生）洪水的问题 “The problem of flooding in China”, Rachel, 2nd-draft, 3rd
writing assignment; *跟美国文化比 “Compared with American culture”, Rachel, 
2\textsuperscript{nd}-draft, 1st writing assignment; *跟 70 年代比 “Compared with the 70s”, 
Martha, 2\textsuperscript{nd}-draft, 4\textsuperscript{th} writing assignment),

- missing topics (e.g., *终于他们成功了 “Finally they succeeded”, Daniel, 2\textsuperscript{nd}-draft, 3\textsuperscript{rd} writing assignment).

- missing verbs (e.g., *这个朋友（说）愚公已经很老 “This friend Yu Gong is very old”, Ben, 2\textsuperscript{nd}-draft, 2nd writing assignment; 还有一个很智慧的朋友 “There is also a very intelligent friend”, Ben, 2\textsuperscript{nd}-draft, 2nd writing assignment).

Based on the modification, student participants could easily correct errors such as the absence of 是 "yes", and 的 "of", the absence of quantifiers, the absence of two syllable words, the absence of verbs and pronouns. However, for the absence of cohesive devices/adverbs and topics, errors remained when participants did the modification.

To Answer Research Question Two

The second research question asked, “What evidence of acquisition in Chinese writing accuracy can be found in the changes in errors over the course of the semester?” According to the following data analysis, the total number of the participants’ errors in the first draft of the four writing assignments were 79, 94, 88, and 60. In terms of the total number of errors, there was no obvious difference in the first three writing assignments, while in the fourth writing assignment, it showed a notable decline.

Errors for Each Writing Assignment

Table 36 shows us the errors in each participant’s writing assignments.
Table 36. Errors in Each Participant’s Writing Assignments.

<table>
<thead>
<tr>
<th></th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ben</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Mary</td>
<td>14</td>
<td>12</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Paul</td>
<td>6</td>
<td>11</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Daniel</td>
<td>7</td>
<td>19</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Martha</td>
<td>25</td>
<td>17</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Rachel</td>
<td>14</td>
<td>21</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>94</td>
<td>88</td>
<td>60</td>
</tr>
</tbody>
</table>

Figure 25 shows a tendency line for total error numbers in each writing assignment.

Figure 26 shows a tendency line for error numbers in each participant’s writing assignments.

![Error numbers for Each Writing Assignment (total)](image)

**Figure 25.** A tendency line for error numbers for each writing assignment (total).
Figure 26. A tendency line for error numbers for each writing assignment (each student).

From Table 36, Figure 25, and Figure 26, the results showed that the total numbers of errors in the first draft of the four writing assignments were 79, 94, 88 and 60. In terms of the total numbers of errors, there were no obvious differences among the first drafts of the three writing assignments. Nevertheless, by the first draft of the fourth writing assignment, there was a notable decline. As the fourth writing assignment did not fall in the period of final examinations, the scoring and writing procedures were the same as before, and the error
numbers were not affected by the degree of attention paid by the participants. From Table 36, four of the participants, there was a clear trend of decrease in the number of errors. Errors in Ben’s writing assignments were 12, 14, 16, and 9. Errors in Mary’s writing assignments were 14, 12, 13, and 6. Errors in Daniel’s writing assignments were 7, 19, 12, and 3. Errors in Martha’s writing assignments were 25, 17, 15, and 8.

**Different Error Types**

Table 37 displays number of errors by different categories.

**Table 37. Number of Errors IC, WS, and MW Errors.**

<table>
<thead>
<tr>
<th></th>
<th>1st-assignment</th>
<th>2nd-assignment</th>
<th>3rd-assignment</th>
<th>4th-assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>10</td>
<td>16</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>WS</td>
<td>26</td>
<td>34</td>
<td>45</td>
<td>26</td>
</tr>
<tr>
<td>MW</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

The number of IC, WS, and MW errors remained stable and there were no obvious changes. For MGC errors, there were no notable changes in the total numbers in the first three writing assignments, but an obvious decrease occurred in the fourth writing assignment. Based on the first drafts of the six participants and the overall summary, the data showed that the numbers of errors in the first three drafts were similar, but the error numbers decreased in the first drafts of the fourth writing assignment. The types of errors made by the participants were also similar, including WS, IC, MS, and MGC errors, while SVO, VCO, VO, and SC errors were relatively rare. Moreover, there were individual differences among participants, for example, Martha used more complex and longer sentences compared with the other five student participants, and she made a great number of VCO and VO errors, which would be further explored in answering research question 3 and research question 4 in this study.

In interviews, both participants and teachers said that they believed that the
improvement of writing accuracy via this writing approach was a long-term process, because they needed to be familiar with this new writing approach in the first two writing assignments (it might take one month). Meanwhile, the writing ability would see improvement only after a certain period of error revision and only after accumulating a certain number of errors. In addition, the results showed from the data that the number of WS, IC, and MW errors did not decrease obviously in the four writing assignments, however, student participants were able to revise these types of errors much more effectively. We could also see the student participants' views through the interview data: they said that after they used certain vocabulary and phrases in the first writing assignment, they had very few opportunities to use the same words or phrases in the second writing assignment. Some participants and teachers pointed out that the total number of WS, IC and MW errors needed to be accumulated to a certain extent before they could be reflected in the accuracy of writing. Therefore, improving the accuracy of WS, IC, and MW would be a long-term process, the effect of WCF feedback might not be reflected in short-term writing projects or intensive courses.

MGC errors showed a notable decline in the four writing assignments. In interviews, student participants said that such errors were like "knowledge-based" errors. For example, if they understood how to use punctuation and the formal format of writing, they would avoid such errors in their writing assignments. Meanwhile, the repeatability was very high. Some student participants stated that once they knew how to use punctuation and follow the required format of writing, they would try to avoid repeating such errors in the first draft of the second writing assignment after correcting the MGC errors in the first writing assignment. For these errors, they also needed to accumulate to a certain extent, such as the use of double quotation marks, for example, if participants did not use double quotation marks in the first writing assignment, they had to wait until they made such errors before they had a chance to understand them. Therefore, in the previous two writing assignments, the total numbers of
MGC errors were rather considerable, but by the third and fourth writing assignments, there had been a significant decline. Participants had sufficient opportunities to be exposed to such knowledge, but they might not have learned such content due to memory or failure to acquire this knowledge. Therefore, they still made such mistakes. The online coded WCF multiple-draft writings provided learners a chance to review the relevant knowledge and recall the previous learning content, which could improve the students' writing ability.

To Answer Research Question Three

The third research question asked, “How do third-year Chinese students and their teachers view the indirect and coded WCF and the computer-mediate WCF CMS?” This section presented the relevant survey data and then explained and triangulated the results and patterns from the interview data, which aimed to explain the student participants’ attitudes toward computed-mediated coded WCF, online multiple-draft Chinese writing, and the CMS and technology. Based on the survey data, the results of the study indicated that participants had different attitudes toward WCF. Some student participants held positive attitudes from the beginning, believing that they could make progress by correcting errors, while some participants held very negative attitudes toward correcting errors from the beginning, and some participants were unwilling to face their errors: they thought that too many errors were the embodiment of their lack of Chinese writing ability.

The survey included eight questions. In order to better reveal the changes and trends of students’ views on the computer-mediated WCF in the cross-case analysis, the survey questions were combined into three categories to address the three central questions: how did the students feel about computer-mediated coded WCF? How did the students feel about online multiple-draft Chinese writing? How did students feel about CMS and technology? The first category of questions (aiming to discover how the students felt about computer-mediated coded WCF) included “how easy is it to understand the error codes?”, “views on
teachers’ feedback?”, “how do you feel about coded error corrections?”, and “how do you feel about computer-mediated coded WCF?”. The second category (aiming to discover how the students felt about online multiple-draft Chinese writing) included “How easy is it to understand how to use the online multiple-draft writing feedback system?” and “the website interfaces”. The third category (how the students felt about CMS and technology) included “the CMS navigation” and “how do you feel about the error’s statistical functions?”

The following tables present the participants’ responses to the survey questions. They reveal changes in students’ attitudes and views across the four surveys.

**Attitudes and Views toward Computer-Mediated Coded WCF**

Table 38 shows changes in students’ attitudes and views toward computer-mediated coded WCF across the four surveys.

**Table 38. Attitudes and Views toward Computer-mediated Coded WCF.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st-essay</strong></td>
<td><strong>2nd-essay</strong></td>
<td><strong>3rd-essay</strong></td>
<td><strong>4th-essay</strong></td>
</tr>
<tr>
<td></td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
</tr>
<tr>
<td></td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
</tr>
<tr>
<td></td>
<td>4. Extremely helpful.</td>
<td>4. Extremely helpful.</td>
<td>4. Extremely helpful.</td>
</tr>
<tr>
<td></td>
<td>2. Not so important.</td>
<td>2. Neutral.</td>
<td>2. Very important.</td>
</tr>
</tbody>
</table>
Table 38 (Continued)

<table>
<thead>
<tr>
<th></th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Not important.</td>
<td>2. Neutral.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
</tr>
<tr>
<td></td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
</tr>
<tr>
<td></td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
<td>2. Very important.</td>
</tr>
</tbody>
</table>

According to this data, participants’ views on the understanding of the error codes changed over time. In the first survey, six student participants said it was neutral/not easy or hard to understand the codes. In the second survey, there were still some student participants (Paul, Daniel, and Martha) who expressed difficulty in understanding these codes. In the third survey, five student participants began to say that they could understand and remember these codes very easily now, and they were getting familiar with the approach. In the fourth survey, six student participants said it was easy to understand the error codes.

Ben, Mary, Martha, and Rachel had consistent positive attitudes and views toward teachers’ feedback, they said “teachers’ feedback is very important” from the first survey to the second survey. Paul and Daniel had a negative attitudes and views toward teachers’ feedback, and they changed their attitudes to positive since the third survey.

In the first survey, Ben and Mary believed that this computer-mediated coded WCF
helped them to improve their writing. When the researchers asked how they felt about coded error corrections and how they felt about computer-mediated coded WCF. Ben and Mary chose very helpful from the beginning, and their positive attitudes did not change in the four interviews. Martha and Rachel chose somewhat helpful at the beginning, but their attitudes changed to very helpful in the second survey. Paul and Daniel chose not helpful in the first survey and not helpful/somewhat helpful in the second survey, but their attitudes and views changed to somewhat helpful/very helpful in the third survey and in the fourth survey. Since the third writing assignment, Paul and Daniel began to think that it was helpful for them. Rachel said it was very helpful in the second survey, but in the last survey, Rachel chose somewhat helpful. In the fourth interview, she said that she thought the computer-mediated coded WCF would be helpful to her, because she could know where the errors were, and she could reflect on that and make some revisions and talk with the teacher to learn the appropriate grammar and vocabulary. However, she felt frustrated when she still had a large number of WS errors in the first draft of the fourth writing assignment, so she thought the computer-mediated coded WCF did not work for her.

**Students’ Views of Multiple-Draft Chinese Writing in CMS**

Table 39 shows the participants’ responses to the survey questions. They reveal changes in students’ attitudes and views of the online multiple-draft Chinese writing across the four surveys.
Table 39. Students’ Attitudes and Views of Online Multiple-draft Chinese Writing.

<table>
<thead>
<tr>
<th>Name</th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>use.</td>
<td>2. Neutral.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
</tr>
<tr>
<td>Mary</td>
<td>1. Neutral.</td>
<td>1. Easy to use.</td>
<td>1. Easy to use.</td>
<td>1. Easy to use.</td>
</tr>
<tr>
<td></td>
<td>2. Neutral.</td>
<td>2. Neutral.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
</tr>
<tr>
<td></td>
<td>2. Neutral.</td>
<td>2. Neutral.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
</tr>
<tr>
<td></td>
<td>2. Neutral.</td>
<td>2. Neutral.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
</tr>
<tr>
<td></td>
<td>2. Neutral.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
<td>2. Easy to use.</td>
</tr>
</tbody>
</table>

Table 40 shows the participants’ responses to the survey questions. They reveal changes in students’ attitudes and views of the CMS and technology across the four surveys.
Table 40. Students’ Attitudes and Views of the CMS and Technology.

1. How is the CMS navigation?

2. How do you feel about the error’s statistical functions?

<table>
<thead>
<tr>
<th></th>
<th>1st-essay</th>
<th>2nd-essay</th>
<th>3rd-essay</th>
<th>4th-essay</th>
</tr>
</thead>
</table>

Fix student participants also indicated that the online multiple-draft Chinese writing and feedback system were not easy to master at the very beginning, they chose neutral, not easy to use, or hard, but they slowly got used to it in the second survey or in the third survey.
In terms of whether it was easy to interact with the website, six participants indicated that it was neutral or not easy to use in the first survey. However, by the third and fourth surveys, six participants began to say that it was easy to interact with the website.

Toward the error statistics function, students’ attitudes showed a change from positive to negative. In the surveys, the researcher asked how they felt about the error’s statistical functions. The CMS showed the participants a pie chart which demonstrated the numbers and proportions of their errors. In the first survey, six participants thought this function was very helpful as most participants said in the interview that it could help them track and record their errors. Based on the statistical charts, they would know where they had made progress and where they still needed to learn. But in the third survey, Rachel expressed that this method was not very helpful. In the fourth survey, three participants (Mary, Martha, and Rachel) said that it was not helpful. In the interview, participants explained the reasons. They said that they thought it would be helpful at the beginning, but by the third writing assignment, they found that the error numbers as well as types of errors did not decline obviously. They felt very frustrated when they found that their errors, such as WS errors, did not change significantly, which had negative effects on their motivation and enthusiasm for writing and revising.

Student participants hold different views on the design of the CMS. In the surveys, the researcher considered that the design of the CMS would affect the student participants’ views of indirect coded multiple-draft Chinese writing. For example, a user-friendly design of the CMS could lead the student participants to look up the codes more quickly and effectively and help student participants to revise the errors more quickly. On the contrary, if it was not convenient, the student participants would spend more time in modifying their errors and they would gradually lose patience, thus reducing the success rate of modification. In the surveys, the researcher asked the student participants about website design issues like whether the
website was easy to navigate. In the first survey, five student participants chose neutral and they expressed that they could not use the navigation conveniently and found it was difficult to use. One student participant (Rachel) indicated that she could use the navigation effectively in second survey. In the third and the fourth surveys, five student participants chose easy to use. In order to explore the impact of CMS design factors on the student participants' writing and error feedback, the researchers invited a professional instructional technology designer to evaluate the CMS usage process based on website design criteria. The CMS assessment will be discussed in the last section of Chapter Five.

The Teacher’s Interview

The interview was conducted in Chinese, and the researcher translated the interview into English. When asked “how long does it usually take to provide feedback on students’ writing assignments?”, the teacher told the researcher that the time depended on many factors, such as different students, the teacher’s familiarity with the website and codes, and different writing assignments, but the average time the teacher spent was around 15 minutes for each student’s writing assignment.

The teacher said, “It depends, I think, average is 15 minutes, some students make lots of errors, I need to spend more time on these students. At the beginning, I need to spend time on looking up the error codes. After the second writing, I think, I am more familiar with the codes. And it also depends on which writing assignment, in the fourth writing assignment, I think students made less errors so that I spent less time on providing feedback.”

When asked “what kinds of error did students make?” and “what types of errors do students select to ignore when they modify the coded errors feedback?”, the teacher mentioned that students made a large number of errors at the vocabulary/phrase level, such as WS errors, IC errors, MW errors, and MGC errors. And the teacher pointed out that students did not correct WS, IC, MW, and MGC errors in the first and second writing assignments, but
in the third and fourth writing assignments, students did successfully correct WS, IC, and MW errors.

The teacher said, “I did not do the calculations, I think I provided a lot of feedback on WS errors, IC errors, MW errors, and MGC errors. I do not remember if I provided a lot of error feedback on SVO, VCO, VO, and SL errors. I think the errors were mainly vocabulary or phrase levels errors. I think at the very beginning, some students did not take it very seriously, thus, they did not correct the errors, I do not know the reason, I think you could know this by talking with them, I gave some students very low scores, I think they noticed the low scores and began to correct errors more seriously. For some other reasons, I think you need to talk to them to find out”.

When asked “what factors lead to this avoidance?” and “during the multiple-draft assignments, do students repeatedly make certain mistakes in their writing assignments during the whole semester?” the teacher hypothesized that students’ attitudes and proficiency levels might lead to this avoidance, and she said that students repeatedly made certain error types, such as WS errors and IC errors, in their writing assignments throughout the whole semester, however, the teacher did note that once students received feedback on WS errors, they were able to avoid misusing those particular words in future writing assignment.

The teacher said, “I think students’ attitudes might be a factor influencing their revisions, I think, I think some students did not take revision very seriously so that they did not correct the errors. For some types of errors, such as VCO and VO, I think the student did not know how to correct the error by herself, I think it is pretty hard, it is not easy to do this. We need to provide some support to help them correct these types of errors.” The teacher also said, “I think they repeatedly make WS errors and IC errors in the four writing assignments, it is unrealistic to require them not have WS errors when they write a new writing assignment by using new words, but I think, the good thing is, I find out that, if students make an error on
WS or MGC, they did not repeat this error (not error type) in the next writing assignment, so I think they learned something”.

When asked “what other suggestions do you have for improving the online feedback system to provide more effective feedback on students’ Chinese writing?”, the teacher indicated that in providing WCF to the first drafts of the four writing assignments, using indirect codes could save a lot of time for her, especially if many students were enrolled in the writing class, and it would be very helpful if students had to write more and more compositions at advanced proficiency levels. In addition, the teacher said that it was convenient for her to correct, save, and review the students’ writing assignments on the computer. She did not need to print assignments out before making modifications and she could send the writing assignments back to the students immediately after completing WCF. In the interview, the teacher said that coded WCF was very helpful, and the CMS design was not difficult for her, but this interview was administered after the training workshop (the interview occurred at the end of the semester), in which the researcher provided some technology support to the teachers on how to use the CMS. In addition, the teacher frequently used computers, so the teacher could master the system quickly. According to the teacher, it would be difficult for teachers who used computers less frequently to get familiar with these functions, especially if the program did not provide technology support or a technology training workshop. The teacher complained about the format of the CMS document processing (i.e., uploaded document format), because some student participants would scan their manuscripts and save them as PDF files for uploading, but some student participants would use their smart phones to take pictures, and then uploaded and saved the picture in jpeg, raw, or tif formats. However, the codes could only be displayed correctly in PDF files, and there might be minor display errors in other formats, which largely influenced the effectiveness of teachers’ WCF.
The teacher said, “Suggestions? Uh, I think, you need to consider Chinese teachers’ technology skills and background. I am very comfortable with using computer to work, and I use computer very often, I think it is OK to me, but for some teachers who do not use computers very often, you need to consider this, you need to teach them how to use the learning management system. I think the online setting has many benefits, for example, I do not need to print their writing assignments out, it saves time, papers, money, and ink, I just drag the codes to the paper and send back to students, it helps a lot, especially when you have a lot of students in your class, when students get advanced level, they will have lots of writing assignments, I think this online setting will save my time when I provide feedback on their writing assignments. And all their writing assignments are saved on the website, it is very helpful. I think the format of their writing assignment is very annoying, the website does not support the jpeg format very well. Ask students to use the pdf format in the next semester, it is very important, please make a note”.

In sum, the teacher believed that computermediate coded WCF would help student participants improve their writing skills in revisions and accuracy, because participants would take teachers' feedback seriously, which could make teachers' feedback valuable. In addition, the teacher pointed out that it was a time-consuming job to correct the writing assignments for the students. Now the teacher could drag and use the codes to provide feedback to the participants in the first draft on the CMS. It saved a lot of time, but several problems still remained. One was the teachers' familiarity with the website. According to the teacher who participated in the CMS training workshop held by the researcher before the research began, the teacher said that because of the workshop, the teacher could use it at the beginning of the research, but the teacher was still not proficient with the mode in the initial stage of the research. Therefore, future research needed to take full consideration of the different technological levels of foreign language teachers. Secondly, for the error types, the teacher
thought there were too many types of errors. For some error types, the student participants would not have these types of errors in their writing assignments at this proficiency level. Indeed, the teacher thought that too many types of errors might distract the student participants' attention. In addition, the teacher thought that some types of errors might overlap with others, which also might influence the effectiveness of teachers’ WCF.

**To Answer Research Question Four**

The fourth research question was “What factors influence students’ incorporation of teacher feedback in their writing?” Research results revealed the following factors which affected the participants' revisions. For each factor, the participants' original interview transcripts were quoted to support it.

**Unfamiliar with the Online Indirect Coded WCF**

Ben, Mary, Rachel, and Paul were unfamiliar with various elements of this approach, including indirect coded WCF, error types, the procedures of multiple-draft Chinese writing, and the online settings, which were new to most of the participants.

For student participants, there were so many error types that they could not adapt to them. Before the study the researcher had explained the types and provided examples of errors to the participants with a period of class time and also set aside time for participants to ask questions in class or after class. Meanwhile, the researcher and the teacher had also distributed the relevant materials to the participants. Furthermore, the purposes of the first two writing practices were to help participants understand and become familiar with the types of errors, and the error codes chart was available on the main-page of the CMS for the participants to download and check online. However, student participants said they were not familiar with the types of errors during the first and second writing assignments. They pointed out that they needed more time to master the types of errors. Some student participants confirmed that after the second writing assignment, they gradually got familiar
with the types of errors, and during the third and the fourth writing assignments, they could use them very well.

Interview examples:

Rachel: I did not quite know, sometimes, you put a green check mark, I think, if I remember correctly, no, what did you put, it was blue, I think it meant I did not have a word, but I did not realize it meant that I need a space. So, that one, I think you had the same thing here, what would I do? I did not realize it meant I need a space, I did not understand that marking. (1st-interview).

Martha: Sometimes, I do not remember which color (error codes) they were. (2nd-interview).

Mary: I have to google it to understand what is subject and what is object, to see some examples and then I correct it. (1st-interview).

The student participants were not familiar with the online multiple-draft writing method. Some participants explained that they had not used the multiple-draft writing method before, so they were not familiar with it in the first writing assignment, and because it was carried out in an online setting, there was too much new content and new learning/teaching/managing forms for them to learn and to further get familiar with. Ben said that these factors affected their first two writing assignments.

Interview examples:

Ben: I scheduled 40 minutes to revise the essay, I took 20 minutes to figure out the computer; uh..uh…to figure out the codes, I spent a lot of time on this, I have other homework assignments to do. (1st-interview).

Students’ Error Types and Language Proficiency

When participants neglected/failed to correct some errors, the researcher discussed their choices with them in the interviews. On this issue, participants elaborated a variety of
different reasons. The types of errors largely influenced the participants’ neglecting/failing to correct the errors.

Regarding IC errors, as mentioned above, the teachers found that for IC errors, the situation was complicated. The teacher and the grader thought it was difficult for the participants to correct IC errors. Considering the first and second writing assignments, it could be seen that the student participants could not correct IC errors effectively, but students’ ability to effectively correct IC errors obviously improved in the third and fourth writing assignments. In the interviews, Daniel, Paul, Martha, and Rachel also emphasized that it was difficult for them to revise IC errors in the first and second writing assignments. In the following writing assignments, the participants changed their strategies for revising IC errors: they tried to rewrite IC errors by reorganizing the sentence rather than revising the error from the word-level or phrase-level, so the accuracy of the revision significantly improved.

When the researcher asked the participants how they revised the IC errors, in the second interviews, Daniel, Paul, Martha, and Rachel complained that they did not know how to correct the IC errors.

Daniel: “I think IC errors, I tried to correct, but it seems that it does not work.” (2nd-interview).

Paul: “IC error is hard; I do not know how I can revise.” (2nd-interview).

Rachel: “I think this error category is too broad, for WS errors, I can check individual words in the dictionary, but for IC errors, I didn’t have an effective way to correct it.” (2nd-interview).

Martha: “I think right now I do not have the abilities to correct these types of error on my own” (2nd-interview).

Since the third writing assignment, the participants became more able to correct IC errors. In the fourth interviews, when the researcher asked how the participants revised the IC
errors, participants mentioned that in the third writing assignment, regarding the IC errors, they tried to re-organize the whole sentence rather than concentrating on individual words. They found this strategy was effective when they received teacher’s feedback in the third writing assignment; therefore, they continued applying this strategy to the following writing assignments. Ben, Paul, Daniel, and Rachel mentioned this revision strategy in their fourth interview.

Interview examples about correcting IC errors are provided below:

Paul: “I tried to re-organize the sentences.” (4th-interview).

Daniel: “My friend told me that re-writing the sentence is an easy way to correct IC errors. When I received the teacher’s feedback, I found out that I revised the IC errors correctly, then I kept revising IC errors in this way.” (4th-interview).

Rachel: “I tried, sometimes, I just re-worked the entire sentence, if I really think I couldn’t get past the error. So, if I could, I just tried to take the same idea and do it in a different way.” (4th-interview).

Martha: “I think I might be able to correct more errors in the future, if I can improve my Chinese (proficiency level).” (4th-interview).

Regarding WS errors, some students stated that correcting some types of errors, such as WS errors, would not help them to improve the accuracy in their following writing assignments. After the student participants corrected a WS error, they understood how to use the word, but they might not have the opportunity to use the word again in the next writing assignment. Therefore, for such errors, the success rate of revision was very high, but due to the low frequency of repetition, participants would still make a lot of WS errors in the following writing assignments. Some student participants pointed out that it would help them understand and memorize some new words, but some student participants complained that it would frustrate them as they spent a lot of time on revising the errors, but there was no
notable improvement in their ability to avoid such errors. In the fourth interviews, student participants discussed the reasons why they could correct the WS errors but still kept the error rates high in the new writing assignments.

Interview examples about correcting WS errors are provided below:

Ben: I spent 40 minutes on revising WS errors, but I keep making WS errors, I think it’s because I do not know all the words. (4th-interview).

Rachel: It took me a while to find correct words, for example, like those word took me a while to find (WS errors), like 教训 “lesson”, that is why it took a long time. (4th-interview).

Regarding MGC errors, this factor was relevant knowledge. For some errors with high repeatability, student participants would not make the same mistakes again after corrections. The revision effect of such errors was very positive, such as MGC errors and some format and punctuation errors. These errors were more like knowledge and transferrable errors. If student participants did not know the knowledge, they could not revise these types of errors. Some student participants had to talk with the teachers to understand how to correct such errors. Once student participants made such errors in their first writing assignment, and then the teacher explained the rule to them, they would not repeat the same mistakes in the second writing assignment.

The student participant whose native language was Spanish often used long and complicated sentences without punctuation. In the interview, student participants discussed their view of revising the MGC errors: in the first interview, student participants mentioned that they did not know how to correct MGC errors, and they indicated that once they corrected one MGC error they would learn the knowledge and avoided repeating the same errors in the following writing assignments.

Interview examples about correcting MGC errors are provided below:
1st-interviews:

Mary: “I tried to figure out what I did wrong exactly. MGC is hard to correct.

Ben: “MGC error is the most difficult to correct.”

4th-interviews:

Mary: “Probably missing grammatical component, something, I cannot think of what component it was. I can understand it after talking to a professor. After I figured out the errors, I would know how to handle them in the next writing assignments.”

Ben: “If I have the knowledge of grammatical components, it becomes easy.”

Regarding WO, VC, and VCO errors, this factor here was relevant to Chinese language proficiency levels. For some mistakes, Martha and Rachel said they couldn’t correct them by themselves, such as structural errors like WO, VC and VCO errors. They thought that if WS or IC errors were marked, they could quickly identify the problem and make effective modifications by using a dictionary or network query. However, WO, VCO, and VO errors were beyond their current Chinese proficiency levels, and they lacked the writing abilities and revising skills to make revisions by themselves. VC and VCO were comparatively difficult grammatical structures for learners of Chinese at this proficiency level, and students could not distinguish the differences between VC and VCO. Martha pointed out that the process of thinking about these problems might be a good opportunity to help her improve her writing skills: “after searching how to correct the errors, and then having a face-to-face individual meeting with a Chinese teacher, it was very helpful for me to understand how to use these sentence structures”.

Interview examples about correcting WO, VC and VCO errors are provided below:

Martha: The hardest part was figuring out how to change this (pointed to WO errors). 
I know my sentence was long, but I do not know how to make a long sentence that still makes sense. (3rd-interview).
Rachel: Word order is hard to correct, I think that is my issue is speaking Chinese as well, so it will naturally be the same thing as on writing. (3rd-interview).

Rachel: I know that definitely in speaking (pointed to VCO errors), I mess up like, in the order; order; it sounds weird, so it takes me a while to, sometimes, switch back. (4th-interview).

**The Development of Revision Skills**

Student participants' self-modifying skills were also gradually improving. Based on the data, the researcher could see that the revisions of WS, MW, and IC errors were gradually improving. Through interviews, the results of the study concluded that the student participants' self-modifying skills were improving through indirect coded WCF. For example, the six student participants did not know how to modify IC errors in the first two writing assignments, but the successful revision rate of IC errors improved significantly in the their writing assignments, because participants began to re-construct the whole sentence and re-write the problematic chunk, thus revising IC errors with positive effects.

Concerning reasons for correcting WS errors, for example, all six student participants indicated that they mainly used a dictionary to revise. For instance, in the third revision, Mary began to use an online tool. After inputting the errors into the corpus, she could check where she made the mistakes, and then by inputting the corrected words into the corpus, she could search and check if the revisions were correct. When some participants faced WS errors, they inputted the incorrect words into Google, and they could search the Google results to see how the entry was used and compare the examples with their own usage. In this way, they would know where they made the mistakes. Then they could revise their mistakes and input the new words into Google and search to see if the new words were correct by comparing them to the new Google results. The students learned these skills without the teacher's guidance: it was on spontaneous action of the participants in the revising process. Some participants said that
they learned this skill on the advice of other participants.

Interview examples about revision strategies are provided below:

Martha: Yeah, just tried to look up to see what it might be or think about what material we went over, and to see if it looks like can be used. (3rd-interview).

Paul: For some errors that I do not know how to correct, I google it. (3rd-interview).

Daniel: I used internet and e-dictionary (when correcting errors). (3rd-interview).

Ben: I looked at the dictionary, examples, sentences, so that gave me a better idea, and on Canvas, you put the file for the different examples, and I grabbed those, so that I can see where I make errors, I really like the examples you gave me, so I can have a better understanding of, like, what looks wrong, what looks right. (2nd-interview).

Ben: Yes, I checked the dictionary or checked an online dictionary. (3rd-interview).

Mary: I used an online grammar book, it is called Allset learning, it is Chinese resource wiki, I checked what I can use, I also used Pleco, it is a Chinese-English dictionary in the app store, I used it on my cellphone. (3rd-interview).

Rachel: Usually the word choice, I was trying to look it up, to see if it is better or bad word (when revising errors), I tried to find if there are, any similar sentences online. (3rd-interview).

Students’ Views on Computer-Mediate Coded WCF

The participants' attitudes and views also had a certain impact on the improvement of modification and the reduction of their total number of errors. Most student participants said they rarely read the teacher's WCF before the study because the teacher did not set assessment requirements for the written corrected feedback. Therefore, ignoring teachers’ WCF would not affect the scores of writing assignments. Paul and Daniel said they would put teacher’s WCF in file folders after they received it. In addition, some student participants said even if they reviewed the feedback, if the teacher did not give them feedback on the
modification, they did not know whether they were correct or not, so they would give up modifying.

In the interviews, most student participants thought that this multiple-draft writing mode would improve their writing. But in the process of revision, especially in the first and second writing assignments, some student participants found that it was stressful to revise their writing assignments. Thus, at the beginning, they ignored some errors or did not seriously revise them. When they found that the effects of revisions would affect their grades, their attitudes changed, and they began to revise the errors seriously. For example, Daniel said that he gradually realized that he could learn a lot in the process of careful revision. Another participant, Paul thought it was not worthwhile to spend so much time on correcting errors in the first interview. Paul gradually changed his attitudes after he communicated with the teacher and revised his errors as well as exchanged ideas with his peers for the third and second fourth assignments. In addition, student participants learned that they could search for a word in a dictionary or an online tool to revise WS errors, which could improve their ability to learn Chinese independently, so they thought the time they spent on correcting errors would be worthwhile.

1st-interviews examples:

Daniel: Probably one hour, I think I should spend more time on it, but I think if the teacher helps me to correct errors, it is more helpful. (1st-interview).

Paul: I think this method is not worthwhile, I spent a lot of time on this, I do not think it is helpful, I have a lot of homework to do. (1st-interview).

3rd-interviews and 4th-interviews examples:

Daniel: I think it is really a practice though, I can go back to edit it, because getting the grade, and then seeing what I did wrong, I feel it’s better to fix it and see if I fix it properly, I think it’s worth the time, definitely worth the time. (4th-interview).
Paul: Yes, I can learn something from correcting the errors. I often talk to my classmates and tried to find useful information online. (4th-interview).

Student Participant’s Beliefs

Teachers’ indirect coded WCF challenged writers’ beliefs and their own meanings. Some participants insisted what they had written was correct, which were mainly in WS errors. For example, Rachel used the word 该死 "damn" in the first draft of the second writing assignment. Although the teacher knew the word was used correctly in semantics, from the perspective of culture and formal Chinese writing, it was not appropriate to use such a word in a college-level writing assignment. Therefore, the teacher and the grader marked it as a WS error, but Rachel did not revise the error, and during the interview, Rachel insisted that the word could express her anger regarding the unequal marriage relationships in rural areas in China. She also said she refused to revise the word and ignored the WCF. In addition, Martha also said that the words she used could express what she wanted to utter. She would not revise these errors because she did not believe these words were wrong, and Martha and Rachel thought that the teacher might have misunderstood their expressions or their real meanings. For example, Martha said that she did not think the teacher understood her emotion, so she refused to correct the mistake and waited for the interview with the researcher to negotiate her word choice.

Interview examples:

Rachel: I do not really think it was an error; I am very angry about Chuncao’s (a character in the textbook) parents, uh, uh, the marriage is unfair, I think I was trying to use this word 该死 (damn) to express my emotions. Why it is wrong? I used this word for the unfair relationships, not for Chuncao’s parents. (1st-interview).

Martha: “I just think the teacher might not know what I am trying to say, what I am trying to express, the teacher did not understand this. I do not want to use another word, I
think it is right, sometimes I use this kind of words when I communicate with my Chinese friends, they told me it is cool, and it is Okay.” (1st-interview).

Participants’ Understandings about the Purposes of Learning

Some participants were not clear about the purposes of the online indirect coded WCF and the multiple-draft Chinese writing. For most of the student participants, the total number of errors showed a gradual decreasing trend over the four writing assignments. The number of errors in the first-draft of the first writing assignment was the most, and then the errors gradually decreased in the first-draft of the second, third and fourth writing assignments. Two student participants, Daniel and Paul showed special cases: the total number of errors in their first drafts of the first writing assignment was the least, in contrast with the first-draft of their second and third writing assignments, especially for the WS errors. Daniel had only one WS error in the first draft of the first writing assignment, but twelve WS errors in the first draft of the third writing assignment.

In the interview, the researcher tried to find out the reasons. After the student participants submitted the second-draft of the first writing assignment, the researcher interviewed the two participants separately. Paul explained that he thought accuracy was the most important part of Chinese writing, so he tried to use familiar words and phrases. He even used sentences that he had used in his previous writing assignments. In order to get a good score, he intended to avoid using unfamiliar words or newly-learned words as much as possible. Paul emphasized accuracy in the interview:

Paul: “Uh, uh, I spent one hour on this, and I think accuracy is the most important, I used some familiar words, and, and, uh..., I reviewed my previous writing works, perhaps, from last semester, I tried to use some familiar sentence structures, words, I hope I can have a good score, you know; GPA is very important to me.” (Answered in Chinese, translated into English) (1st-interview).
The researcher explained that the purpose of the indirect coded WCF and online multiple-draft Chinese writing was to help participants improve their ability to correct errors and improve their writing strategies. Errors in the first drafts of writing assignments would not affect their performance and scores. The researcher suggested that he wrote as naturally as possible. In the interview, the researcher also encouraged him to use more newly-learned words to express his ideas rather than limiting his expression for the sake of accuracy; also, the researcher suggested that he took advantage of the opportunity to improve his writing ability through revision. After that, the participant began to write naturally, so there were many errors in the following writing assignments, especially WS errors.

Daniel pointed out that after interviews he began to try to use new words and phrases instead of the “safe words” he already knew. His errors were mainly WS errors. From these data, the accuracy of WS was not easy to increase. Errors were mainly in phrases, and there were fewer errors in sentence structures, which might also reflect that the participants' ability to write long and complicated sentences was insufficient at their proficiency levels. Daniel also emphasized accuracy in the interview:

*Daniel: “I focused on accuracy, it could help you (teachers) to understand what I am trying to say. I used some sentence patterns in my previous writing assignments, which makes me feel like I can write confidently”*. (Answered in Chinese, translated into English) (1st-interview).

**Other Factors: Martha’s Native Language, Time and Carelessness**

Regarding the influence from native language, in this study, most of the students rarely had VCO or VO errors. Martha showed a special case: this participant made a lot of VCO and VO errors, and the participant used more complex sentences and long sentences. During the interview, the researcher found that the participant's native language was Spanish. She pointed out that when she wrote the composition and revise errors, she would first think...
of how to write/revise the sentences in Spanish and then wrote/revised the sentences in Chinese, so there were many long sentences and complex sentences in her four writing assignments.

Interview example:

Martha: I am an international student, I am from Colombia, I speak Spanish, sometimes, when I am writing the homework, uh...uh... I am thinking of Spanish, and I write it in Chinese.

Regarding time and carelessness, Ben and Mary participants said that the reason for not correcting some errors was due to their carelessness, and they did not have sufficient time to correct the errors. Ben found that it was stressful to revise their writing assignments as it took a lot of time. After the teacher pointed out the errors in the first interview, he recognized the errors and said he would examine the errors more carefully in the following writing assignments, and Ben said he should spend more time on correcting errors in the following writing assignment.

Interview examples:

Ben: Uh...uh... I did not see that. (1st-interview).

Mary: I did not notice the error. (1st-interview).

Ben: I spent 40 minutes on revising WS errors. I did not schedule sufficient time to correct the errors. (1st-interview).

Use Effect Assessment

The study applied Use Effect assessment criteria to evaluate the CMS. The Use Effect assessment included four categories: accessibility, identity, navigation, and content, including a total of 25 questions. For each question, the evaluator used 1-3 to score: 3 means no need to change, 2 means acceptable but needs minor modifications, and 1 means the website requires major modifications. This evaluation standard was first applied to evaluate commercial
Therefore, the professional instructional technology designer made appropriate modifications to the criteria, so the Use Effect assessment could be applied to the online courses in the CMS. Table 41 shows the ratings given by the evaluator:

**Table 41. Use Effect Assessment.**

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Site load-time is reasonable</td>
<td>3</td>
</tr>
<tr>
<td>2. Adequate text-to background contrast</td>
<td>3</td>
</tr>
<tr>
<td>3. Font size-spacing is easy to read</td>
<td>2</td>
</tr>
<tr>
<td>4. Flash &amp; add-ons are used sparingly</td>
<td>2</td>
</tr>
<tr>
<td>5. Images have appropriate ATL tags</td>
<td>1</td>
</tr>
<tr>
<td>6. Site has custom not-found/404 page</td>
<td>3</td>
</tr>
<tr>
<td>7. Course logo-number/name is prominently placed</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Tagline makes course’s purpose clear</td>
<td>2</td>
</tr>
<tr>
<td>9. Home-page is digestible in 5 seconds</td>
<td>3</td>
</tr>
<tr>
<td>10. Clear path to course information</td>
<td>3</td>
</tr>
<tr>
<td>11. Clear path to contact information</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Main navigation is easily identifiable</td>
<td>3</td>
</tr>
<tr>
<td>13. navigation labels are clear and concise</td>
<td>3</td>
</tr>
<tr>
<td>14. Number of buttons/links is reasonable</td>
<td>3</td>
</tr>
<tr>
<td>15. Course logo-number/name is linked to home-page</td>
<td>1</td>
</tr>
<tr>
<td>16. Links are consistent and easy to identify</td>
<td>3</td>
</tr>
<tr>
<td>17. Site search is easy to access</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 41 (Continued)

<table>
<thead>
<tr>
<th>Content</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Major headings are clear and descriptive</td>
<td>3</td>
</tr>
<tr>
<td>19. Critical content is above the “fold”</td>
<td>3</td>
</tr>
<tr>
<td>20. Styles and colors are consistent</td>
<td>3</td>
</tr>
<tr>
<td>21. Emphasis (bold, etc.) is used sparingly</td>
<td>3</td>
</tr>
<tr>
<td>22. Ads and pop-ups are unobtrusive</td>
<td>3</td>
</tr>
<tr>
<td>23. Main copy is concise and explanatory</td>
<td>3</td>
</tr>
<tr>
<td>24. URLs are meaningful and user-friendly</td>
<td>3</td>
</tr>
<tr>
<td>25. HTML page titles are explanatory</td>
<td>3</td>
</tr>
</tbody>
</table>

Based on the User Effect assessment, the evaluation data showed the CMS-based course design had a good performance in navigation, so it could help participants find information quickly. There were some defects in the other three aspects, which might hinder the use by participants, thus affecting the performance of participants' writing and revision. For example, there was no obvious difference between the size of the title and the body text, so participants might not be able to obtain important information. There was no clear tag for the pictures used in CMS, so it might prevent some browsers from using the screen reader and affect the participants' understanding of the pictures. The researcher’s and teachers' orientation materials, research instructions, code charts, contact information, and syllabus were saved in a PDF file in a folder in the CMS, so participants needed to find the folder and the PDF files, before they could get the information via the web browser or downloading the PDF file, which might hinder them from contacting researchers and teachers to ask questions or browsing detailed research information. The title/logo of the course was not linked to the home page. When the participants clicked on it, they could not access the home page to get all the navigation information. In addition, the table of codes was displayed on the homepage and it could also be downloaded by users, therefore, when students modified their writing
assignments, they needed to connect to the homepage to find the error codes chart, which might affect the convenience of accessing the error codes chart when the participants were revising their writing assignments. Furthermore, the CMS-based course lacked a search function. When participants wanted to find a document, an example sentence, or a writing task, they needed to go back to the home page to find the information. They could not use the search function, so it might affect the participants’ user-experiences.

Chapter five presents research findings to answer the four research questions from a cross-case analysis perspective. Answering RQ 1 relied on quantitative and qualitative data that reflected the changes in the writing and revision of the participants' four writing assignments and revealed how student participants responded to WCF. Answering RQ2 analyzed participants’ writing data and interview results, and the research findings showed the accuracy in participants' writing and changes of accuracy of revisions in the second-draft of their four writing assignments. Answering RQ3 and RQ4 relied on qualitative data, gleaned from questionnaires and interviews, and further explored the reasons for the changes in writing and revision.
CHAPTER SIX:
DISCUSSION, IMPLICATIONS, AND CONCLUSION

Chapter six discusses findings of the four questions in order to further provide implications for Chinese teaching, CMS designing, and future research. In the elaboration and discussion of the results, this chapter is divided into four sections, including 1) discussion about the results of the study with those of other relevant studies, 2) discussion about the results of the study in light of the constructs of ZPD and scaffolding and discussion about new light the study sheds on the research phenomenon and on related theory, 3) discussion about the implications for teaching and research in CMS settings, and 4) the limitations of the research and implications for future research. A conclusion section will highlight the significance of the research and provide a closure for the dissertation.

Comparing the Results of the Study with Other Relevant Studies

The Effectiveness of WCF

Many studies argued that WCF has no effect on students’ L2 writing improvements (e.g., Kepner, 1991; Semke, 1984; Truscott, 1996; Truscott and Hsu, 2008; etc.). Truscott (1996) argued that CF “had little or no effect on students’ writing ability” (p.330) and even had a negative effect on students’ writing. Truscott and Hsu (2008) insisted that WCF’s little effect on students’ revisions “did not extend to a new writing task performed a week later” (p. 292). Truscott and Hsu’s study required students to revise their errors for one essay, and one week later, all students wrote a new essay. The research results showed that there were no significant differences between the control group and the treatment group in error rates in the new essay. They concluded that successful error revision is not a predictor of learning and
improvements in revision are not evidence for increased writing ability.

Based on the current research findings, the current research also poses several challenges to the point of view that WCF has no effect on students’ writing. Considering the first drafts of student participants’ first three writing assignments, the research findings did not reveal significant changes in WS and IC error rates for the first drafts, but the main reason was that student participants used new words. However, the current study challenges the view that WCF has no effect on students’ writing in four aspects. First of all, in the fourth writing assignment, the error rates of the six participants’ first draft writing assignment were reduced. Truscott and Hsu’s studies were conducted in one-week long settings; therefore, their research findings only demonstrated that CF has no effect in a short-term program. However, WCF could become useful when it is applied to a semester-long program.

Secondly, WCF may be one factor influencing error reduction and other factors may play a role as well. In the current study, there were no obvious changes in error rates of the first three writing assignments, but that might not be evidence that WCF had no effect on improving learners’ writing. Based on the surveys and interviews in the research, the study found that other factors such as students’ attitudes toward WCF, students’ understanding of the WCF purposes, students’ familiarities with the approach also played significant roles in error rates.

Thirdly, Truscott and Hsu’s studies did not consider the error types or the fact that different error types lead to different results in student participants’ error rates and revision rates. Because the writing tasks changed, students had to use new words in the new writing tasks, which would lead to new WS errors. Therefore, it was easy to see that WS and IC error rates could not be changed significantly in a short time period. For these types of errors, students needed to accumulate a certain amount of errors, and only by experience with correcting these errors, would they understand and remember how to use these words in the
Furthermore, the research found that WCF could lead to revision and reduction in terms of accuracy in revising and avoiding certain types of errors (such as MGC and MW) and accuracy in certain types of errors (such as WS and IC) for a long period of time. It appears that WCF interacts with other factors influencing error correction. In other words, the effects of the computer-mediated coded WCF interacts with many different variables including time ranges, learner attitudes, error types, and so forth.

**WCF and Students’ Attitudes**

Regarding the possibility that WCF has harmful effects, researchers (e.g., Knoblauch and Brannon, 1984; Truscott, 1996) have pointed out that WCF might lead students to have negative attitudes toward writing. For example, Knoblauch and Brannon (1984) indicated that “students who did not receive correction had a more positive attitude toward writing than those who did” (p.28). Truscott (1996) also emphasized that research on writing effects should not neglect the importance of attitude. He mentioned that “all else being equal, a class students enjoy is preferable to one they do not enjoy, and a good attitude toward writing is preferable to a bad one” (p.28). The current research study confirmed that students’ attitudes played an important role in writing. The research findings also revealed that students’ attitudes should be viewed as dynamic instead of static. In the subsequent interviews, the researcher found that some student participants had changed their attitudes about the mistakes that they could not modify. Besides, students who took WCF seriously would have to spend much time reading, reviewing, searching, comparing, thinking about, and correcting the errors.

Another harmful effect which mentioned in the literature review was that students simplified their writing in order to receive high scores and avoid corrections (e.g., Kepner, 1991; Sheppard, 1992). In this research, two student participants’, Paul and Daniel’s,
examples showed that the students initially reduced the complexity and creativity of their writings in order to avoid errors. Paul shortened and simplified his sentences and Daniel used “safe” words in the first writing assignments in order to avoid corrections and receive higher scores. However, the students changed their attitudes after the first assignment. After teachers explained the purposes of the writing tasks, Paul and Daniel began to write long and complex sentences. Therefore, the study provided evidence to indicate that students’ initial negative attitudes towards writing and unwillingness to the risks toward writing could change.

The Effectiveness of WCF and students’ views on WCF

The research findings supported Ferris’s suggestions on coded WCF. Ferris and Roberts (2001) found out that when teachers provided focused WCF to students, students responded that they found the feedback useful and effective; thus, they suggested that “teachers should take a more finely tuned approach to provide coded error feedback” (p. 181). The current research findings also revealed that students could effectively make certain types of modifications, but it was difficult for them to correct sentence-level errors by themselves.

The current research findings are similar to those of Ferris (2010) and Robb et al. (1986) in that giving indirect coded WCF did not seem to yield an immediate or short-term advantage to students’ writing. Ferris (2010) indicated that when providing WCF, instructors need to consider the length of the program. She suggested that research on WCF should obtain evidence to learn whether indirect WCF could be worth giving in a short-term program or could be modified to be useful in a short-term program. The current research found that it took time for students and teachers to become familiar with indirect codes, multiple-draft writings, and online settings. Therefore, the results of the study indicated that the online coded multiple-draft writing approach was suitable for a long-term writing program.

Based on the four writing assignments, four revisions, surveys, and interviews, the
results of the study showed that students’ revisions varied depending on error types. Students had different rates of success in correcting different error types. This finding is reminiscent of Ferris and Roberts (2001) research findings: there are differences across error types in self-correcting errors. As Ferris and Roberts (2001) mentioned in their research, error types largely impacted students’ ability to self-correct. Ferris and Roberts mentioned that students who received WCF were more successful in correcting the “treatable” error types (i.e., verbs, noun endings, and articles) than the “untreatable” error type (sentence structures). The current research findings also revealed that the six students could more successfully revise WS errors and IC errors than sentence structure errors. In the surveys and in the interviews, students mentioned that they did not know how to correct the VCO or WO errors, and some students indicated that they were not at the appropriate level to correct the sentence structure errors and they needed teachers’ help and support. However, this student’s views of indirect feedback changed as he became more engaged with coded feedback.

Ferris (2010) also found that all the participants in her research reported that they wanted errors corrected by their teacher. Based on her survey, most students stated that their preferred error correction technique was for the teacher to mark errors and use a code to label the errors. The current researched aimed to examine whether students liked the indirect coded WCF technique or not. The results were dynamic: some students did not like the technique at the beginning of the writing program, with many factors impacting their views, such as their learning goals, time, learning background, their unfamiliarity with the technique, and so forth. For example, a student was largely influenced by a previous teacher’s direct feedback technique: this student resultingly believed that teachers should provide direct feedback to him and that direct feedback was the most useful WCF technique.

**Theoretical Contribution**

This section discusses the results of the study in light of the constructs of ZPD and
scaffolding. In the early stage of second language writing research, the process approach encouraged teachers to provide feedback to students through multiple drafts and encouraged students to revise their errors during the process of revision. With the developments of SLA theory and WCF, researchers have begun to pay attention to how interactions, social environments, and learners’ individual factors facilitate L2 writing development. Based on the research findings, the current study indicated that learner factors facilitated the development of Chinese writing revision and accuracy. Student participants’ individual learning goals and learning motivations facilitated error revisions. For example, Ben and Mary aimed to continue learning Chinese in graduate school and to pursue future careers in the fields of East Asian Studies; therefore, they had clear goals in learning Chinese writing and correcting their errors. As a result, they performed better than other students in the four writing assignments. Paul and Daniel intended to communicate with Chinese native speakers; therefore, they paid more attention to speaking and listening and had little interest in practicing their Chinese writing, which led to their relatively low scores on the first two revision assignments. After they realized the importance of Chinese writing, and when they noticed that by correcting errors they could also improve their Chinese speaking and listening abilities, they began to take WCF seriously and devote more time to correcting errors. Student participants’ understandings of the purposes of WCF also facilitated the development of the Chinese writing revision and accuracy. For example, Paul and Daniel initially simplified and shortened their sentences in order to avoid errors and to get high scores. After they realized the purposes of the writing practices, they changed their views and completed the writing assignments based on the writing requirements. Further, student participants’ understanding of the multiple-draft writing approach, error types, and the CMS settings facilitated their learning: student participants experienced a progression from “unfamiliar” to “familiar” in the semester-long program, and once students were familiar with the online
multiple-draft Chinese writing setting, they achieved better performance in writings and revisions in the last writing assignment compared to previous writing assignments.

According to the Interaction Hypothesis (e.g., Hyland & Hyland, 2006; Long, 1996), the teacher-student interactions that occur in the process of learning are important. In the interviews and surveys, student participants expressed the significance of interacting with teachers in the WCF process. The computer-mediated coded WCF and multiple-draft writing approach strengthened the interactions between students and teachers. The study designed a cycle. Figure 27 represents the cycle used in the study to promote the interactions between teachers and students.

![Figure 27. The process of interactions between teachers and students.]

As shown in the Figure 27, the process included two teacher-student interactions in the form of providing teachers’ WCF and one teacher-student meeting for discussing errors. In the interviews, students indicated that they valued the meeting after they revised the first drafts. Based on the interactions, students had two chances to think about teachers’ WCF and to revise their errors. This is in contrast to the most widely-used Chinese writing process model: writing-WCF-meeting-revision. Teachers who are used to the widely-used model
could adapt the new model and continue to devote the same amount of time that they have always devoted to providing WCF to writing, but students could receive more interactive opportunities, which would lead them to treat teachers’ feedback more efficiently.

The ZPD is the “distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Scaffolding describes teachers’ supportive instructions when they collaborate with students to complete tasks. The research findings show the role of the ZPD and scaffolding in the process of online multiple-draft Chinese writing setting. When applied to the field of WCF, scaffolding and the ZPD are activated in the process of providing feedback and collaboration between teachers and students as shown in the Figure 28.

![Figure 28. ZPD in the process of providing feedback and collaboration.](image)

Figure 28 considers WCF and teacher-student meetings together as one instance of scaffolding. The area in the center of the figure represents students’ ability to autonomously revise the errors in their first draft by proofreading or self-checking. The ZPD area represents...
students’ ability to revise the errors with support from WCF, embodied CMS tools, technology-based tools, and meetings with teachers. The outermost layer represents a stage of development in which students cannot correct their errors, even with support. The study included two layers of scaffolding in the ZPD area: one was the support from WCF and technology-based tools, and the other layer was teacher-student interviews. The study found that the ideal strategy of scaffolding was teachers providing scaffolding in different layers, with teachers adjusting the intervention layer in terms of students’ performances. The two layers of scaffolding are as follows Figure 29:

**Figure 29.** The two layers of scaffolding process.
Figure 29 considers two layers of scaffolding, which could also be understood as two levels of the ZPD. The area in the center of the figure represents students’ finding and correcting the errors on their own. ZPDs varied depending on the error types. The first ZPD area represents students’ correcting errors based on WCF and technology-based tools. The error types included WS, IC, and MW errors. For example, based on the teacher’s WCF, Mary was able to use online dictionaries, web searching functions, and an online tool to search how to correct errors. The second ZPD area represents students’ simultaneous ability to revise the errors successfully after talking to a teacher to learn how to correct the errors. In this ZPD area, teachers also were able to adjust the intervention strategies based on how students responded to the teacher’s WCF. In the research process, the researcher also noticed that the students’ ZPDs and scaffolding were not static; on the contrary, students’ ZPDs and scaffolding were dynamic and confirmed to develop the process. The students were developing new scaffoldings, such as applying new technology and new writing strategies for revising errors, which could extend and change the ZPD area. For example, in the learning process, the students found an effective strategy to correct IC errors in the third writing assignment, and some student participants found some useful online-based applications and a Chinese corpus to help them to correct errors. The role of the ZPDs and scaffolding in this study could also support Bitchener’s (2012) and Lantold & Thorne’s (2007) suggestion that when L2 learners acquire appropriate scaffolding, they can achieve higher L2 proficiency levels.

Implications for Teaching and Instructional Technology in CMS

Teaching Implications

For some error types, such as MGC and MW, the research findings revealed that learning from correcting the errors were relatively easier to transfer to new writing tasks compared to other error types. When students understood the knowledge behind the MGC
and MW errors, they would transfer this knowledge to the new writing tasks and avoid repeating the same errors in the new writing tasks. WCF had immediate effects on these types of errors so that it could be used in a short-term program.

This study suggested that in the process of multiple-draft Chinese writing, it would be better to include the opportunity for students to meet with teachers. Students could use this opportunity to discuss errors with teachers. Similarly, because of this opportunity, students would have more motivation in revision, and the video function of the CMS platform would provide a good medium for this discussion. Course designers could consider inserting video chat plug-ins so that the students could make appointments with teachers in advance, and then teachers and students could talk through real-time video.

Teachers could try to facilitate the attitude transition of the students. For example, before the beginning of the writing project, teachers could invite some advanced-level Chinese learners to share their experience of using indirect coded WCF. If they couldn't come to the classroom, teachers could try to upload the video in the CMS and encourage students to watch it at the beginning of the semester, or the teacher could show the output of the writing approach and the improvement data to the students, so that the students could know the effectiveness of the approach of the indirect coded WCF of multiple-draft Chinese writing.

Teachers should explicitly explain the purposes of writing tasks to students, and teachers should design rubrics or grading criteria to show students the importance of writing long and complex sentences and the significance of the revisions. Teachers should also emphasize their own attitudes and views toward students’ errors, letting students know that errors in writing will not make teachers angry and frustrated. In contrast, teachers should emphasize that students can improve their ability to correct errors and learn autonomously through correcting errors. Meanwhile, teachers should make clear learning/teaching purposes, not focusing on the accuracy of the first draft, but more on the revision of the second draft.
When WCF is applied in TCFL, teachers could consider providing students some Data-Driven Learning (DDL) tools before the beginning of the writing class, such as introducing some qualified online dictionaries and some widely-used corpora. Several studies (e.g., Boulton, 2009; Gilquin and Granger, 2010) have reported L2 learners using DDL, such as corpus data, as a support for L2 learning. Boulton (2009) reported that DDL could be used for a wide range of L2 learners after he examined the ability of novice-level L2 learners to use corpus data to learn English. Gilquin and Granger (2010) indicated that DDL played an important role in providing corrective feedback: L2 learners can correct errors and improve their writing by comparing their own writing with corpus data. Therefore, providing students these DDL resources in advance could accelerate the students' adaptation to the writing approach and improve the students' revision efficiency. Meanwhile, teachers could organize discussion activities so that students could discuss and share errors. To a certain extent, this could stimulate students to share their own DDL resources. In addition, it would also help them acquire more vocabulary.

**Error Categories**

Jin’s (2013) research concluded that error categories, error units, and correcting criteria should be designed based on student backgrounds, curriculum requirements, and teachers’ needs. The research findings corresponded to Jin’s conclusions. Through data analysis, we could see that there were few sentence structural errors. Through interviews and analysis of the four writing assignments, the researcher concluded that the student participants had not achieved a writing level at which they would use a large number of complex and long sentences and write paragraph-level essays. According to ACTFL proficiency levels writing section, the requirements for the Intermediate Mid and the Intermediate Low levels are:

*Intermediate Low: “Writers at the Intermediate Low sublevel are able to meet some*
limited practical writing needs. They can create statements and formulate questions based on familiar material. Most sentences are recombinations of learned vocabulary and structures. These are short and simple conversational-style sentences with basic word order. They are written almost exclusively in present time. Writing tends to consist of a few simple sentences, often with repetitive structure. Topics are tied to highly predictable content areas and personal information. Vocabulary is adequate to express elementary needs. There may be basic errors in grammar, word choice, punctuation, spelling, and in the formation and use of non-alphabetic symbols. Their writing is understood by natives used to the writing of non-natives, although additional effort may be required. When Intermediate Low writers attempt to perform writing tasks at the Advanced level, their writing will deteriorate significantly and their message may be left incomplete” (ACTFL Proficiency Guidelines, 2012).

Intermediate Mid: “Writers at the Intermediate Mid sublevel are able to meet a number of practical writing needs. They can write short, simple communications, compositions, and requests for information in loosely connected texts about personal preferences, daily routines, common events, and other personal topics. Their writing is framed in present time but may contain references to other time frames. The writing style closely resembles oral discourse. Writers at the Intermediate Mid sublevel show evidence of control of basic sentence structure and verb forms. This writing is best defined as a collection of discrete sentences and/or questions loosely strung together. There is little evidence of deliberate organization. Intermediate Mid writers can be understood readily by natives used to the writing of non-natives. When Intermediate Mid writers attempt Advanced-level writing tasks, the quality and/or quantity of their writing declines and the message may be unclear” (ACTFL Proficiency Guidelines, 2012).

The types of codes were adapted from Jin’s study (2014). Jin (2014) designed these error types based on advanced-level Chinese learners. Therefore, although the researcher
made necessary adjustments to cater to intermediate-level Chinese learners, the researcher found that some of the error types were still unsuitable for intermediate-level learners. Placing these error types in the codes table would distract the attention of the participants and teachers. Therefore, the researcher suggests that different code types be tailored to different proficiency levels. Different codes could also be designed according to teachers' teaching purposes. For example, if a teacher's purpose in a semester is to improve students' vocabulary, the teacher could delete SVO and VCO but should pay more attention to WS, IC, MS, and so forth. Therefore, we could consider providing only a subset of the error types for a specific Chinese class or a specific Chinese program and strengthen the modification of certain types of errors to accelerate the participants and teachers' mastery of indirect coded WCF, and to better improve the effectiveness of the revisions and the accuracy of writing.

**Teachers’ Instructions on Computer-Mediated Coded WCF**

According to the surveys and interviews, the student participants were unfamiliar with the approach of indirect coded WCF of multiple-draft Chinese writing, and its various elements, including the form of multiple-draft Chinese writing, the error codes used, the online learning environment, and the new plug-in functions in the CMS.

Teachers and curriculum designers' clear and detailed guidance in the initial stage would play a significant role in the effectiveness of this approach and the quality of the course. In the current study, the number of errors in the fourth writing assignment decreased right after the revision scores improved significantly in the third writing assignment, indicating the importance of time. In the questionnaires and interviews, participants also expressed that they needed some time to adapt to this new approach. Therefore, effective guidance from teachers and curriculum designers at the beginning would help students adapt to the system and improve the effect of WCF and students' revision.

Teachers and curriculum designers should first set up a brief introduction and a
detailed explanation, so that students could understand the above-mentioned aspects. With repeated guidance and explanations as well as adequate time, students could get familiar with the entire system. Furthermore, the teaching/learning goals and objectives should be emphasized in the syllabus, orientation, and the homepage of online courses, so that students could repeatedly review the purpose and effectiveness of this writing approach. Only by familiarizing students with all relevant aspects of the approach will teachers help students have a better understanding of the indirect coded WCF.

Teachers and curriculum designers should also increase students' patience with this writing approach and should help students avoid frustration, disappointment, worry and irritation in the process. Teachers and curriculum designers should emphasize from the beginning that as a long-term process, one should not expect to see immediate progress in a few weeks, and teachers should encourage students to adhere to this approach for writing training.

Teachers and curriculum designers should not overly emphasize the total number of errors students make in the writing process, because in the interviews, the students said that because the total number of errors did not decrease, they felt disappointed and frustrated. Teachers and curriculum designers should pay more attention to the changes of participants' revision effects and teach the revision effects to students in advance, so that the students will be aware of their improvements in the revision process. Based on the data, the participants' modification indeed showed significant progress: students could further be encouraged to continue writing in this approach by recognizing this progress. In addition, teachers and curriculum designers need to consider factors such as students' writing ability, native languages, teaching purposes and objectives to reduce the number of codes types and focus on a certain number of error types at specific stages.
Instructional Technology Implications

The previous section mainly discusses the teaching implications and suggestions for this writing approach from the perspective of second language acquisition. In this section, the researcher will explore the problems in CMS-based online course design from the perspective of instructional technology and further discuss how to design a CMS-based online course and teach/learn Chinese writing online more effectively.

As this writing approach is suggested for use in a long-term project, Chinese program directors, teachers, and web designers should make full preparations at the beginning, and they should form a cooperative environment in the design stage so as to facilitate the further development and modification of the online courses in the following stages. In this part, the researcher will reflect from the instructional technology perspective to make recommendations on the web design and user experience based on 1) the design and process of the research, and 2) the participants' writing data, interviews, and questionnaires. The researcher intends to provide relevant suggestions for future online writing design. In this section, the researcher will use the ADDIE (cited from Morrison, 2010), “Analysis, Design, Development, Implement, and Evaluation” design model to make recommendations for future design and developing processes.

Regarding analysis, first of all, the course designer needs to conduct a needs analysis/front-end analysis (e.g., Morrison, 2010; Piskurich, 2006) at the beginning, which is not only related to the students, but the designer also needs to analyze the needs of the program director and the teachers to decide whether or not to use this writing approach or partly use this writing approach.

This analysis includes four parts: the first part is context, and the curricular designers should consider the question “what is the need for the indirect coded WCF on CMS”? The curriculum designers need to investigate if there is a need to have this course (students,
directors, and teachers) and determine data collection methods (survey, observation, interview, or focus group). The curriculum designers need to decide which method to use to collect data from students, teachers, and directors. In the process of data collection, the curriculum designers should provide an outline of the steps of data collection and discuss the pros and cons of the methods selected and finally discuss the findings.

The second part is assessing the target learners and identifying the characteristics of the learners in each category: 1. Cognitive characteristics: curriculum designers need to confirm students’ Chinese proficiency levels according to ACTFL proficiency guidelines or according to the placement tests in the Chinese program. 2. Prior knowledge refers to the situation of students' native language and educational backgrounds. The differences in students' native languages will affect the use of error code categories. Therefore, teachers need to take this into account when designing codes. 3. Affective characteristics: for example, students' interests in and motivation for using WCF. If students state that they have anxiety or negative attitudes, teachers should provide more detailed instructions and guidance before the project, and 4. physical characteristics: the curriculum designers should consider two factors: one is health, and the other is computer skills. Health issues should be considered mainly in the website design. If students have visual disabilities, the website design should follow ADA standards, and the teaching methods and the ADA standards should be balanced. For example, ADA standards require subtitles for each video, but for foreign language teaching/learning, dialogues with subtitles may affect students' learning. Since hearing disability students are not able to learn without subtitles, we can consider hiding subtitles so that students with hearing disabilities can open hidden subtitles. In addition, curriculum designers should also consider screen readers and take into account color matching to ensure that all students can access the information. Considering levels of computer skills, through interviews with teachers, we found that the two teachers had rich experience in using
computers, but without prior training, it may not be easy for teachers to explore the use of the CMS by themselves. Therefore, if there are people in the teachers' team or students who have insufficient experience in using computers, website designers should provide more opportunities for students and teachers to learn how to use the website.

The third part is that after assessment has been conducted of the learners of Chinese, directors of the Chinese program, and teachers of the Chinese program, the implications of the design need to be addressed. Based on the analysis of the first two parts, this part needs to put forward the design idea, communicate with the project director, teachers and some students, and listen to their feedback.

In the fourth part, the curriculum designers should consider the following questions: is their proposal meeting the needs of the program/teachers/students? Is there evidence of approaching the assignment in a thoughtful way? Does their proposal take into account the feedback from the project director, teachers and students? In order to obtain the approval of the project director, the curriculum designers need to document their work and keep the documents in good condition for repeated review in the following design sections.

The second stage is design. In the process of design, curriculum designers must design under the guidance of teaching methods provided by project directors and teachers. Designers need to consider teaching objectives and ongoing evaluation from the target audiences. Every part of the technology design needs to consider the objectives and desired functions. In addition, project directors and teachers need to provide evaluation and feedback from a pedagogical perspective. In this stage, the most important thing for the course designer is to start using a flowchart to complete the design of a blueprint and time-table for the whole website, such as what content is on the home page, what buttons are on the home page, which page to enter after clicking, and so on. Such a flow chart can guarantee the clarity and logic of the website and reduce errors in the later design. The flow chart should be completed after
getting approval from the program director and teachers. Cooperation between the course designers, the teachers and the project director will play an important role in this stage. In order to improve the efficiency of collaboration, the researcher suggest that the team can start using the Monday.com website to collaborate and input the tasks and deadline of each person into the network. Thus, the website will show everyone’s schedule in the team, which can ensure reasonable and effective allocation of work.

The third stage is development. The curriculum designer needs to complete a storyboard first. A storyboard is the static map of the website that will be presented in the future. It involves content, pictures, links, buttons, color matching, and so forth. Curriculum designers need to consider six basic principles (e.g., Morris, 2010) in the process of development.

The first one is layout consideration: where things should be on the computer screens. The second is functionality, which refers to the functions included in the website, such as uploading documents, online corrections, online messages, and so forth in the current courses. The third part is “show, don’t tell”: it’s better to be image-oriented rather than text-oriented in order to communicate more quickly and effectively. The image orientation in this part does not mean that in language teaching/learning, all instructions are through pictures. However, when explaining how to use the website and the writing procedures, we should try to use pictures. In addition, pictures can be used to set the context of language learning. The fourth is basic screen types. The fifth is to bring the story across. The sixth is humanistic design: if the online course is rude, people will react to it like a rude person.

In addition to the above six basic design principles and according to the research findings, we have the following more detailed suggestions. In text design: a dark-colored font on a light-colored background is preferred. Text formatting should be consistent and follow the “less is more” rule. In image design: images should be relevant to the content, the images
should be easy to see and in high resolution, with alternative text added to describe the image. MP3 format for audio and MP4 format for video are preferred. All text in a course should be searchable. If using PDF files, the site should have an accompanying plain text version. All documents should have file extension types, such as .ppt, .doc, .jpeg, and so forth. In code chart design: charts need to have identified headers as well as summaries. An optional floating window to display codes should appear when students are modifying essays. The chart will allow students to read the code categories while modifying the errors. When they are familiar with the code categories, they can also choose to turn off the floating window to avoid disturbance. In hyperlinks design: the logo/number of the course needs to be clickable and linked to the home page. The text of all hyperlinks should be limited to a sentence or less to foster readability. Html validation should be provided from the w3c for the pages content, CSS validation should be examined from the w3c for the page’s layout. Web designers should also consider providing screen readers.

The uploading document function requires the students to save their documents in PDF format. If there is no scanner, they can convert their pictures into PDF format after taking photos. The format should be unified in advance, and students should be clearly taught in the course instructions and orientation how to convert their files to the correct format. After the storyboard is completed, directors, teachers and students need to evaluate the storyboard, and then curriculum designers will modify according to this feedback. After the curriculum designers modify the storyboard, and the program director approves the storyboard, the website development can begin. In this process, the collaboration on the Monday.com website will also provide great help for team cooperation.

The fourth step is implementation. The main consideration here is delivery and instructional management. In this study, we used the Canvas platform for delivery as it can ensure the stability and security of online courses. Other commonly used CMS platforms
include Blackboard, Moodle, and so forth. If it is an independent CMS, we need to further consider the access speed, security, stability, and other factors of the host server. From the perspective of instructional technology and according to the research experience, the researcher suggests that the online course designer use many ways to guide users repeatedly, such as video demonstrations, picture descriptions, text explanations, workshops, teachers’ orientations, FAQs, and short-term online technology live-chat support and Q and A before school starts. For the added video and audio, team cooperation is needed, including cooperation between the video and audio specialists.

The fifth step is evaluation. In this part, project directors and teachers provide feedback for online courses from the perspective of teaching methods and user experience. According to their feedback, designers will make necessary modifications. At the same time, professional instructional technology designers need to evaluate from the perspective of science and technology, so as to avoid any hindrance brought about by scientific and technological design to the success of teaching methods and the students' experience.

Designs may use a checklist to evaluate accessibility, such as Web Content Accessibility guidelines 2.0 and WebAIM’S WCAG 2.0 Checklist. In the whole design process, because the technological developers may not understand the principles and methods of language teaching methods, and the content developers are language educators who may lack the knowledge of science and technology, it is inevitable that there may be some information gaps. For example, adding a function from the perspective of teaching methods will help students to some extent. However, for technology developers, this function may affect the loading speed of the website, and it may cause students to give up opening the web page. Sometimes, there is a difference in the expectations of working time between the content developers and technology developers. The content developers may think that a change will only take ten minutes, but the technology developer may need to re-code it,
which may take one day.

To solve this kind of problem, based on the reflection of this research study, the researcher suggests that it is helpful for the technological developers to have a teaching or educational background in second language acquisition, so they can better understand the teaching methods and Chinese pedagogy and so they can also better communicate with content developers.

If the technological developers come from a pure computer science and technology background, the program director should organize regular meetings for content developers and technology developers in future development. In addition, science and technology developers can organize workshops on science and technology for language teachers on a regular basis. On one hand, it can improve teachers' ability to use science and technology in teaching. On the other hand, they can also explain the basic procedures and concepts of the website design, so that language teachers can further understand the work of science and technology developers.

Moreover, program directors can encourage and support technological developers to participate in language teaching methods training, or to participate in online language teaching methods courses offered by Cousera.com. When technological developers have some knowledge of language teaching methods, they can better understand the theory of language teaching methods and teachers' ideas. The cross-training is based on the design process of the current research, implementation process, and participants' feedback experience and reflection.

In terms of the functions of the CMS, the study also provided some suggestions for improvement from the pedagogical point of view. In the questionnaires and interviews, some participants said that they neglected some mistakes because of carelessness. Therefore, the study suggested that if CMS could mark a number before each error and mark the total
number of errors in the end, the function could help students find their own errors more accurately and conveniently. For the distribution chart of error statistics, the trend of this distribution chart was similar to the previous trend data of error statistics (e.g., first-writing assignment and second-writing assignment). Since the number of errors could not decrease in a short time, the usefulness of this statistical function was not obvious. The number of errors might change only after long-term and continuous use. In addition, this chart only showed the changes of participants' error numbers, but the students still did not know whether their ability to revise errors was improving or not and they could not see their own progress in correcting errors. If a statistical distribution chart of the revisions was added, the changes in the chart would be more helpful to students. Some students proposed some modification techniques, such as using dictionaries, Google search, database search, etc. Therefore, in online classes, course designer could add dictionaries, Google search and important copra plug-ins, so that students could directly use these functions in the platform.

The Limitations of the Research and Implications for Future Research

In this research, there are some limiting factors. Firstly, this study only aims at one target language, so if the target language is different, the conclusions may be different. Secondly, this study only applies to one project in one school. If it is used in other schools and other projects, it may present different effects. Thirdly, the study lasted four months during which the participants completed four essays. If the length of the study is changed or the writing task is changed, the results might be different. Fourthly, this study is mainly aimed at intermediate level learners, so for other learners at other proficiency levels, the final conclusion may be different. Fifthly, this research mainly uses the Canvas platform. If other platforms are used, it may bring different IT evaluation results. Sixthly, the participants' ages range from 18 to 25, so the study may have different results for students of different ages. In the future, if more participants are willing to apply this mode to writing, there will be more
participants, different proficiency levels, different network platforms, different languages and other variables. More studies would yield more results which could shed more light on the effect of computer-mediated indirect WCF. If future research aims to generalize from sample to population, researchers could recruit a large number of participants. Researchers could also collect more data from student writing. Through comparison of a large amount of writing data, the comparison of total errors, and the comparison of correction scores, researchers could obtain a more convincing comparison from a statistical point of view. For future research, other measures of revision scores, such as average scores, can be used to examine the effectiveness of revision. Different measures may provide other teaching and research implications in computer-mediated coded WCF.

Ferris et al. (2013) argue that research on the effectiveness of WCF should not only consider students’ written products. They suggested that research should go beyond the students’ written products. The current research findings also showed that in the process of responding to WCF, students could improve their revision skills and develop their writing strategies; for example, since the third writing assignment, the students discovered new strategy to correct IC errors, and they began to explore technology tools online to help them correct errors. Thus, research investigating the effectiveness of WCF should go beyond discussion of students’ written products and also consider the students’ learning in the WCF process.

Several research questions may be examined in future research, for example: 1) is there a significant difference between no-feedback groups and computer-mediated coded WCF groups for long-term improvement in Chinese written accuracy? 2) is there a significant difference among students in different Chinese proficiency levels in using the computer-mediated coded WCF? and 3) based on a pre-test and a post-test, does the computer-mediated coded WCF lead to successful input of targeted grammatical features, such as the use of
cohesive devices? If the research design focuses on providing in-depth data, several research questions may be examined, for example: 1) how can researchers design WCF error types based on students’ backgrounds? Students’ learning experiences, Chinese language proficiency levels, and native languages need to be considered. 2) What error types impact the multiple ZPDs. 3) In the context of TCFL, what types of errors can be successfully treated for short-term/long-term Chinese writing improvement? 4) how advanced-level Chinese students respond to SVO/VCO/VO/WO errors? and 5) what individual differences impact students’ attitudes and views on computer-mediated coded WCF?

Table 42 summarizes different aspects teachers or researchers would need to consider when they design courses or studies in writing:

<table>
<thead>
<tr>
<th>Time ranges</th>
<th>Short-term; Long-term.</th>
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<tr>
<td>Writing development objectives</td>
<td>Accuracy, writing strategies, writing skills</td>
</tr>
<tr>
<td>Error types</td>
<td>Non-transferred to new tasks; transferred to new tasks.</td>
</tr>
<tr>
<td>Students</td>
<td>Chinese language proficiency levels, motivations, views, attitudes, understandings, etc.</td>
</tr>
</tbody>
</table>

**Conclusion**

This section provides a conclusion highlighting the significance of the research and providing a closure for the dissertation. The dissertation applied a multiple-case method to explore the effects and students’ views of teachers’ coded WCF in online multiple-draft Chinese writing. Six participants completed four writing assignments, four surveys, and four interviews in a semester-long research setting. The researcher collected data to explore four research questions: how students responded to the teachers’ indirect, coded, and computer-
mediated WCF in their writing, what evidence of acquisition in Chinese writing accuracy could be found in the changes in errors over the course of the semester, what views third-year Chinese students and their teachers had of the indirect and coded WCF and the computer-mediated WCF CMS, and what factors influenced students’ incorporation of teacher feedback in their writing.

Regarding the first research question, the student participants generally had lower scores in the revision of the first writing assignment, the situation improved in the revision of the second assignment. The revision scores of the third writing assignment and the fourth writing assignment were better than the revision scores of the first writing assignment and the second writing assignment. Regarding the second research question, the research findings revealed there was no obvious difference in the first three writing assignments, while in the fourth writing assignment, it showed a notable decline. Regarding the third research question, the research findings revealed that student participants had dynamic attitudes and views toward the computer-mediated coded WCF. It was not easy for them to master the code types in the beginning, but they gradually became familiar with them. Regarding the fourth research question, the research findings revealed the factors influenced students’ incorporation of teacher feedback in students’ draft. The factors includes 1) students failed to correct errors because they were unfamiliar with the computer-mediated coded WCF; 2) the types of errors and Chinese language proficiency levels largely impacted the student participants’ failing to correct the errors; 3) student participants’ self-modifying skills and strategies were gradually improving, which impacted their effectiveness of correcting errors; 4) student participants’ dynamic attitudes and views toward computer-mediated coded WCF was another factor influencing students’ incorporation of teacher feedback in their writing; and 5) Based on some special cases, the research findings also indicated some other factors: students’ beliefs, native languages, time, and carelessness.
The research also provided some implications for teaching and research: 1) Effect of WCF varied depending on coded WCF interacts with other variables to influence students’ revisions; 2) Students’ attitudes and views should be viewed as dynamic instead of static. 3) Providing only a subset of the error types for a specific Chinese class or a specific Chinese program and strengthen the modification of some certain types of errors to quicken the participants and teachers' mastery of indirect coded WCF; 4) Computer-mediated coded WCF activated ZPD and scaffoldings; and 5) Use the ADDIE model to design computer-mediated courses.

Providing feedback “is one of the most time-consuming and exhausting aspects of teachers’ jobs” (Ferris, 199, p. 1). Therefore, for researchers, it is important to explore the effectiveness and efficiency of providing feedback. For instructional technology designers, it is important to consider how to design CALL activities to support providing feedback. This dissertation explored and discussed how to effectively incorporate WCF into teachers’ practical teaching and helped educators of Chinese to know about computer-mediated WCF in Chinese writing and about students’ perceptions of the computer-mediated WCF, and to think about how to effectively provide WCF.

Many studies on computer-mediated WCF focused on languages other than Chinese. This is one of the first studies that aim at exploring what effect WCF has on Chinese L2 writing. As such, the study contributes to an understanding of the role of computer-mediated WCF in the TCFL setting. The research findings also contribute to SLA theories in the field of TCFL in the way that it discussed the applications of ZPD and scaffolding in the process of providing computer-mediated coded WCF in teaching/learning Chinese. Furthermore, the study proposes some directions and questions for future research.

With the development of modern technology, more and more CALL tools have been developed to support students’ L2 learning. By examining the effectiveness of applying a
CMS to Chinese learning and teaching as well as students’ and teacher’s responses, the study provides some suggestions for designing online Chinese writing courses from the perspectives of second language acquisition and instructional technology. The researcher hopes that future research will discuss the effect of computer-mediated coded WCF at different Chinese proficiency levels, consider how students’ views influence the effectiveness of feedback, explore how error types impact revisions, and analyze scores by other measurement methods.
REFERENCES


Tsai, Y. (2015). Applying the technology acceptance model (TAM) to explore the effects of a course management system (CMS)-assisted EFL writing instruction. Computer Assisted Language Instruction Consortium, 32, 153-171.


APPENDICES
### Appendix 1: Summary of CF vs. No CF

<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Research Purpose(s)</th>
<th>Participants</th>
<th>Proficiency</th>
<th>Instructional Procedures</th>
<th>Research Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semke (1984)</td>
<td>Comparing the effects of four methods of teacher treatment of free-writing assignments.</td>
<td>141 students 10-week.</td>
<td>1st-year German students at U.S. university.</td>
<td>Students’ weekly journal entries on assigned topics were given four different feedback treatments: 1. Comments; 2. Direct corrections only; 3. Direct corrections with comments; 4. Indirect (coded) correction;</td>
<td>Corrections do not increase writing accuracy, writing fluency, or general language proficiency, and they may have a negative effect on student attitudes.</td>
</tr>
<tr>
<td>Fathman &amp; Walley (1990)</td>
<td>Contrasting four types of feedback groups in their content scores on the rewriting task.</td>
<td>72 ESL students A few days.</td>
<td>Intermediate</td>
<td>Students wrote 30-minute in-class compositions. Four feedback treatments: 1. No feedback; 2. Grammar feedback only; 3. Content feedback only; 4. Grammar and content feedback;</td>
<td>The treatment groups who received feedback improved their scores over the control group who did not receive feedback.</td>
</tr>
<tr>
<td>Sheppard (1992)</td>
<td>Comparing the different effectiveness among three types of feedback.</td>
<td>26 ESL students Ten-week</td>
<td>Upper-intermediate</td>
<td>Feedback treatments: 1. Direct error correction; 2. Conferences; 3. No feedback.</td>
<td>The study reported that there were no significant differences among these three groups.</td>
</tr>
<tr>
<td>Polio, Fleck, and Leder (1998)</td>
<td>Comparing direct written CF and no feedback.</td>
<td>65 ESL students Seven-week</td>
<td>Intermediate</td>
<td>Students wrote four journal entries per week. Feedback treatments: 1. No feedback; 2. Received direct written CF.</td>
<td>The research data revealed that there were no significant differences in accuracy between the two groups.</td>
</tr>
<tr>
<td>Ashwell (2000)</td>
<td>Is the content feedback followed by</td>
<td>50 EFL students Second-year EFL writing</td>
<td>Second-year EFL writing</td>
<td>Four feedback treatments: 1. Content then form feedback;</td>
<td>Giving feedback helped students to improve the</td>
</tr>
<tr>
<td>Form Feedback Pattern of Teacher Response Superior to Other Patterns in Terms of the Improvements It Brings About in Student Writing?</td>
<td>One Year</td>
<td>Classes</td>
<td>2. Form Then Content Feedback; 3. Form and Content Then Form and Content Feedback; 4. No Feedback.</td>
<td>Formal Accuracy of Their Writing More Than if They Received No Feedback. The Content Can Be Improved Simply by Rewriting.</td>
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</tr>
<tr>
<td>Study Authors</td>
<td>Description</td>
<td>Participants</td>
<td>Feedback Treatments</td>
<td>Findings</td>
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<tr>
<td>Ellis, Sheen, Murakami,</td>
<td>Providing evidence that CF is effective in an EFL context.</td>
<td>49 EFL students.</td>
<td>Feedback treatments: 1. The focused group received correction of just article errors on three written narratives. 2. The unfocused group received correction of article errors alongside corrections of other errors. 3. No correction. Error types: English articles</td>
<td>The study found that treatment groups outperformed the control group which received no written CF both on an error correction test and on a new narrative writing test.</td>
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<td>and Takashima (2008)</td>
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<tr>
<td>Truscott &amp; Hsu (2008)</td>
<td>Corrective feedback on an assignment helps learners reduce their errors on that assignment during the revision process. Does this finding constitute evidence that learning resulted from the feedback?</td>
<td>57 EFL students. 14-week</td>
<td>Feedback treatments: 1. No feedback; 2. Received written CF.</td>
<td>The research results showed that written CF had a significant effect on students’ revisions. Written CF’s significant effect on students’ revisions did not extend to a new writing task performed a week later: thus, there is no relation between written CF and students’ improvements in writing abilities.</td>
<td></td>
</tr>
<tr>
<td>Bitchener (2008)</td>
<td>Exploring the efficacy of written corrective feedback</td>
<td>75 ESL students 2-month</td>
<td>Feedback treatments: 1. Direct corrective feedback, written and oral meta-linguistic explanation; 2. Direct corrective feedback and written meta-linguistic explanation;</td>
<td>The study indicated that students who received any type of written CF performed better than those who did not receive written CF on accurate use of English articles.</td>
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</tbody>
</table>
| Study (Year) | Investigating the different effects of oral and written CF on students’ accuracy in using English articles. | Participants | Intermediate | Feedback treatments:  
1. Oral recasts;  
2. Oral metalinguistic;  
3. Written direct correction;  
4. Written direct metalinguistic;  
5. Control.  
Error types: English articles | There was a significant difference in accuracy between learners who received direct corrective feedback as well as written and oral meta-linguistic explanation and those received only explicit error correction.  
The result reported that all CF groups, except for oral recasts, significantly outperformed the control group in the immediate and delayed posttests. These findings show that, whereas implicit oral recasts that involve article errors were not facilitative to learning, the other CF types were effective in helping learners improve the grammatical accuracy of English articles irrespective of language analytic ability. |
| Sheen (2010) | 177 ESL students. One semester | 3. Direct corrective feedback only;  
4. No corrective feedback.  
Error types: Two functional uses of the English article system (referential indefinite “a” and referential definite “the”). |
## Appendix 2: Summary of Direct CF vs. Indirect, coded CF

<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Research Purpose(s)</th>
<th>Participants</th>
<th>Proficiency</th>
<th>Instructional Procedures</th>
<th>Research Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lalande (1982)</td>
<td>Conducing an experiment to evaluate the methods of reducing composition errors.</td>
<td>60 learners of German</td>
<td>Intermediate</td>
<td>Five in-class essays and three in-class rewrites. Control group received direct correction of all errors. Experimental group received indirect coded corrections using a checklist of 20 symbols.</td>
<td>The combination of error awareness and problem-solving techniques had a significant beneficial effect on the development of writing skills. Experimental group students outperformed their control group counterparts in eleven out of twelve non-lexical error categories.</td>
</tr>
<tr>
<td>Semke (1984)</td>
<td>Comparing the effects of four methods of teacher treatment of free-writing assignments.</td>
<td>141 students</td>
<td>1st-year German</td>
<td>Students’ weekly journal entries on assigned topics were given four different feedback treatments: 5. Comments; 6. Direct corrections only; 7. Direct corrections with comments; 8. Indirect (coded) correction;</td>
<td>Corrections do not increase writing accuracy, writing fluency, or general language proficiency, and they may have a negative effect on student attitudes.</td>
</tr>
<tr>
<td>Robb, Ross, and Shortreed (1986)</td>
<td>Evaluating the effects of four types of feedback on error in the written work of second language writers.</td>
<td>134 college students; Japanese college freshman in EFL composition classes</td>
<td>Intermediate</td>
<td>Classroom activities consisted of editing sample student compositions and sentence combining exercises. Feedback types: 1. Direct correction; 2. Indirect coded feedback; 3. Indirect highlighted feedback</td>
<td>Evidence against direct correction of error in written work is discussed. The study reported that all four groups enhanced their accuracy on writing.</td>
</tr>
</tbody>
</table>

271
<table>
<thead>
<tr>
<th>Study (Year)</th>
<th>Methodology</th>
<th>Participants</th>
<th>Feedback Treatments</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kepner (1991)</td>
<td>Comparing message-related comments and surface error-corrections to students writing.</td>
<td>60 learners of Spanish. One-semester</td>
<td>Intermediate Students wrote eight journal entries. Feedback treatments: 1. Error correction feedback; 2. Message-related comments;</td>
<td>The study suggested that the L2 teachers’ written CF with explicit rule reminders is ineffective for L2 student writing improvements.</td>
</tr>
<tr>
<td>Ferris (1997)</td>
<td>Exploring the influence of teacher commentary on student revision.</td>
<td>110 first drafts of papers. 47 ESL students.</td>
<td>Advanced Feedback treatments: 1. Margin comments; 2. End comments.</td>
<td>A significant proportion of the comments appeared to lead to substantive student revision, and particular types and forms of commentary appeared to be more helpful than others.</td>
</tr>
<tr>
<td>Ferris &amp; Roberts (2001)</td>
<td>How explicit error feedback should be in order to help students to self-edit their texts.</td>
<td>72 university ESL students. Two semesters</td>
<td>Freshman composition level Students wrote an in-class, 50-min diagnostic essays. Three feedback treatments: 1. Errors marked with codes from five different error categories; 2. Errors in the same five categories underlined but not otherwise marked or labeled; 3. No feedback at all/ (noun ending, word choice categories, normalized error counts, and verb).</td>
<td>The study found substantial, highly significant differences in our subjects’ editing outcomes between the two feedback groups and the no-feedback group. (noun ending, word choice categories, normalized error counts, and verb). No significant differences in editing success ratios between the codes and no codes groups.</td>
</tr>
<tr>
<td>Chandler (2003)</td>
<td>Discovering students’ correction of grammatical and lexical error between assignments reduces</td>
<td>31 EFL students One-semester</td>
<td>Intermediate Students scored between 540 and 575 on Feedback treatments: 1. Direct correction; 2. Simple underlining of errors.</td>
<td>Direct written CF was superior in helping students locate errors and that ESL learners preferred the direct written CF as it is the fastest</td>
</tr>
</tbody>
</table>
such error in subsequent writing over one semester without reducing fluency or quality.

|                | Investigating whether the type of feedback given to adult migrant students on three types of error resulted in improved accuracy in new pieces of writing. | Feedback treatments:  
1. Direct;  
2. Explicit written feedback and student-research 5 minute individual conferences;  
3. Direct, explicit written feedback only;  
4. No corrective feedback. Error types:  
1. Prepositions;  
2. The past simple tense;  
3. The definite article. | Feedback treatments:  
1. Direct;  
2. Explicit written feedback and student-research 5 minute individual conferences;  
3. Direct, explicit written feedback only;  
4. No corrective feedback. Error types:  
1. Prepositions;  
2. The past simple tense;  
3. The definite article. |
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Bitchener, Young, and Cameron (2005)</td>
<td>52 adult migrant ESOL students 12 weeks</td>
<td>Post-intermediate</td>
<td>The study reported that students in the treatment groups showed significant improvements on accurate use of the past simple tense and the definite article in L2 writing.</td>
</tr>
<tr>
<td>Ferris (2006)</td>
<td>Exploring the effectiveness of coded written CF in improving ESL students’ immediate and long-term writing accuracy.</td>
<td>Intermediate</td>
<td>The study reported that over 81% of the errors marked by coded CF were successfully revised by students.</td>
</tr>
<tr>
<td>Foin &amp; Lange (2007)</td>
<td>Investigating how successfully advanced Generation 1.5 college writers can revise their grammar errors in out-of-class writing when a specific set of grading</td>
<td>Advanced</td>
<td>They reported that the rates of successful revision for the eight error types ranged from 71% to 89%. They suggested that coded written CF may assist students in correcting their errors.</td>
</tr>
</tbody>
</table>
|                | 58 ESL learners. One-semester | Correcting eight of their most frequent and problematic grammar errors.  
1. Multiple-draft writing assignments.  
2. Coded written CF which marked the eight categories of errors. | 52 adult migrant ESOL students 12 weeks |
## Table: Examples of治疗方法

<table>
<thead>
<tr>
<th>Study</th>
<th>Description</th>
<th>Participants</th>
<th>Feedback treatments</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis, Sheen, Murakami, and Takashima (2008)</td>
<td>Providing evidence that CF is effective in an EFL context.</td>
<td>49 EFL students.</td>
<td>Feedback treatments: 1. The focused group received correction of just article errors on three written narratives. 2. The unfocused group received correction of article errors alongside corrections of other errors. 3. No correction. Error types: English articles</td>
<td>The study found that treatment groups outperformed the control group which received no written CF both on an error correction test and on a new narrative writing test.</td>
</tr>
<tr>
<td>Sheen (2010)</td>
<td>Investigating the different effects of oral and written CF on students’ accuracy in using English articles.</td>
<td>177 ESL students. One semester</td>
<td>Feedback treatments: 1. Oral recasts; 2. Oral metalinguistic; 3. Written direct correction; 4. Written direct metalinguistic; 5. Control. Error types: English articles</td>
<td>The result reported that all CF groups, except for oral recasts, significantly outperformed the control group in the immediate and delayed posttests. These findings show that, whereas implicit oral recasts that involve article errors were not facilitative to learning, the other CF types were effective in helping learners improve the grammatical accuracy of English articles irrespective of language analytic ability.</td>
</tr>
<tr>
<td>Chen (2012)</td>
<td>Discussing the 38 learners of Intermediate Qualitative research design</td>
<td></td>
<td>Students expressed a</td>
<td></td>
</tr>
<tr>
<td>Ferris, Liu, Shiha, and Senna (2013)</td>
<td>How do L2 student writers receiving focused, indirect, explicit WCF describe their strategies for applying feedback to existing texts and self-monitoring their writing on subsequent texts?</td>
<td>10 “Generation 1.5”</td>
<td>Feedback treatments: 1. Coded indirect feedback; 2. Direct feedback</td>
<td>Students found the techniques used in the study (focused WCF, revision, and one-to-one discussion about errors) useful, but formal knowledge of language rules played a limited and sometimes even counterproductive role in their self-editing and composing.</td>
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</tr>
<tr>
<td>Ferris, Liu, Shiha, and Senna (2013)</td>
<td>How do L2 student writers receiving focused, indirect, explicit WCF describe their strategies for applying feedback to existing texts and self-monitoring their writing on subsequent texts?</td>
<td>1st year university students enrolled in a course called Basic Writing for Multilingual Students.</td>
<td>Feedback treatments: 1. Focused WCF; 2. Revision; 3. One-to-one discussion about errors’; 4. Formal knowledge of language rules;</td>
<td>Students found the techniques used in the study (focused WCF, revision, and one-to-one discussion about errors) useful, but formal knowledge of language rules played a limited and sometimes even counterproductive role in their self-editing and composing.</td>
</tr>
<tr>
<td>Jin &amp; Zhang (2014)</td>
<td>Analyzing CF in terms of error types and compared CF effects in TCFL.</td>
<td>784 essays written by L2 Chinese learners</td>
<td>Five main categories of errors. 1. Using codes to identify the errors. 2. Analyzing revised essays.</td>
<td>The revised writing showed that 59 out of 71 CF units were successfully revised, meaning the successful output modification was 83%, partial output modification was 3%, and failed output modification was 14%. The study expressed that students’ output modification provided evidence that coded written CF positively effects TCFL writing.</td>
</tr>
</tbody>
</table>
## Appendix 3: Summary of Technology and L2 writing

<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Research Purpose(s)</th>
<th>Participants</th>
<th>Proficiency</th>
<th>Technology</th>
<th>Research Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrams, Zs.</td>
<td>Investigating the participant roles learners adopted in the two different writing environments: synchronous computer-mediated-communication and pencil-and-paper group journals.</td>
<td>46 students of German</td>
<td>Intermediate</td>
<td>Synchronous computer-mediated-communication (CMC)</td>
<td>Learners adopt a larger variety of participant roles during CMC than in group journals, these roles were also more interactively negotiated in the CMC environment.</td>
</tr>
<tr>
<td>Bowerman, C.</td>
<td>Examining an eclectic model of writing. Having highlighted the nature of the writing problem and exposed the problems inherent for CALL systems developers, the study presents a solution based on intelligent tutoring systems technology.</td>
<td>Students of German</td>
<td>Intermediate</td>
<td>LICE is an intelligent tutoring system to aid students writing in German.</td>
<td>The success of the LICE project and gauging the extent to which it has met objectives.</td>
</tr>
<tr>
<td>Chen, J.</td>
<td>This study examines a possible link between computer generated feedback and changes in Taiwan EFL business writing students’ writing strategies.</td>
<td>Test group: 42 Control: 38</td>
<td>Business students in senior year</td>
<td>Control group received a placebo computer feedback. Test group received real computer generated feedback on their errors.</td>
<td>The important impact computer generated feedback appears to have on students, including the encouragement of a more process oriented approach in their writing.</td>
</tr>
<tr>
<td>Liou, H.</td>
<td>The study aims to develop an automatic English grammar text-analysis for Chinese students to help writing revision processes.</td>
<td>135 writing samples</td>
<td>Intermediate</td>
<td>Automatic text-analysis project</td>
<td>The findings developed an electronic dictionary, and researched error analysis, linguistic analysis, and natural language processing in computational linguistics.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Authors</th>
<th>Study Description</th>
<th>Participants</th>
<th>Control Group</th>
<th>Treatment Group</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liou, H., Wang, S., &amp; Yuli, H. (1992)</td>
<td>The study addresses whether and in what way grammatical CALL can help English writing instruction in an EFL setting.</td>
<td>52 College freshman EFL major students.</td>
<td>Control group: paper-and-pen</td>
<td>Treatment group: CALL intervention</td>
<td>Results suggested that the combined effect of classroom instruction and grammatical CALL is helpful for writing instruction.</td>
</tr>
<tr>
<td>Meskill, C., &amp; Anthony, N. (2005)</td>
<td>The study examines the online teaching strategies employed by the teachers of first-year Russian class that integrated computer mediated communication (CMC) for extended language practice.</td>
<td>First-year Russian class</td>
<td>Computer Mediated Communication (CMC)</td>
<td>Ideal communicative classroom. Authentic, student-centered activities. CMC includes the opportunity for both teacher and students to stop the clock, examine the language being used in the online conversation, determine teachable and learnable moments, and respond accordingly.</td>
<td></td>
</tr>
<tr>
<td>Sauro, S. (2009)</td>
<td>The study investigated the impact of two types of computer-mediated corrective feedback on the development of adult learners’ L2 knowledge.</td>
<td>23 Intermediate-high and advanced learners of English</td>
<td>CF that reformulates the error in the form of recasts. CF that supplies the learners with metalinguistic information about the nature of the error.</td>
<td>Results showed no significant advantage for either feedback type on immediate or sustained gains in target from knowledge, although the metalinguistic group showed significant immediate gains relative to the control condition.</td>
<td></td>
</tr>
<tr>
<td>Warden, C. A. (2000)</td>
<td>The study aims to understand students’ reaction to feedback.</td>
<td>141 students TOFEL (400-520)</td>
<td>Computer-generated feedback</td>
<td>Computer-generated feedback helps students take advantage of proofreading and other</td>
<td></td>
</tr>
<tr>
<td>Rouhshad, A., Wigglesworth, G., and Storch, N. (2016)</td>
<td>The present study set out to compare the nature of negotiations between Face-to-Face (FTF) and Synchronous Computer-Mediated Communication (SCMC) modes in same-proficiency intermediate dyads.</td>
<td>24 adult English learners</td>
<td>Intermediate adult English language learners</td>
<td>Synchronous Computer-Mediated Communication (SCMC)</td>
<td>This study found significantly more negotiations for meaning in FTF than SCMC mode. Not only were negotiations fewer in SCMC mode, but they were also less likely to be followed by successful uptake and modified output. The quantity and quality of negotiations across the modes suggests that FTF is a better platform for enhancing opportunities for language learning through negotiations.</td>
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<tr>
<td>Kuteeva, M. (2011)</td>
<td>The study aims to describe how the course wiki was used to teach writing for academic and professional purposes, and to analyze what impact using the wiki had on the writer-reader relationship.</td>
<td>14 students</td>
<td>Intermediate</td>
<td>Wiki</td>
<td>The results indicate that using the wiki for writing activities made students pay close attention to grammatical correctness and structural coherence. Writing on the wiki can contribute to raising awareness of the audience and to increasing the use of interpersonal metadiscourse.</td>
</tr>
</tbody>
</table>
Appendix 4: Four Writing Assignments Prompts

Writing prompt 1: The first writing prompt required student participants to watch a 30-minute movie scene about the marriage traditions of young people in a village in China. The movie revealed how parents, social status, financial issues, and other factors influenced the relationships among young people. After student participants watched the movie scene, the student participants were required to briefly summarize the scene, put forward their points of view, discuss their opinions and ideas, and provide examples to support their opinions. The movie scene included 579 Chinese characters and 20 new vocabularies/phrases.

1) Students write an essay to talk about your opinions, ideas, experiences, and make sure to provide examples to support your opinions.
2) Students use complex and complete sentences.
3) At least 300 Chinese characters, hand-write, please complete the essay in 50 minutes.
4) Students follow the requirements of the rating criteria.
5) Students scan or take a picture of your handwriting assignment and submit it via the writing website.
6) Students make sure to submit your writing assignments before the deadline.

Writing prompt 2: The second writing prompt required student participants to read a story (Yugong Yishan) about an old man who moved a mountain in order to let his family to out of the village conveniently. Many people laughed at him because it was impossible to move a mountain, but the old man insisted on moving it. After student participants read the story, the students wrote an essay to briefly summarize the story, to discuss if the student participants supported or opposed the old man’s behavior, to point out their own opinions and ideas, and to provide examples to support their choices. Yugong Yishan included 633 Chinese characters and 25 new vocabularies/phrases.

1) Students write an essay to talk about your opinions, ideas, experiences, and make sure to
provide examples to support your opinions.

2) Students use complex and complete sentences.

3) At least 300 Chinese characters, hand-write, please complete the essay in 50 minutes.

4) Students follow the requirements of the rating criteria.

5) Students scan or take a picture of your handwriting assignment and submit it via the writing website.

6) Students make sure to submit your writing assignments before the deadline.

Writing prompt 3: The third writing assignment was related to a Chinese idiom story Da Yu Zhishui (The Great Flood of Da Yu). The student participants read a famous Chinese idiom story about a great flood that forced people to leave their homes to live on the high mounts. Da Yu led people to attempt to control the great flood. The student participants were required to write an essay to briefly introduce the story, illustrate their points of views toward the story, and provide examples to support their points of views. Da Yu Zhishui included 627 Chinese characters and 23 new vocabularies/phrases.

1) Students write an essay to talk about your opinions, ideas, experiences, and make sure to provide examples to support your opinions.

2) Students use complex and complete sentences.

3) At least 300 Chinese characters, hand-write, please complete the essay in 50 minutes.

4) Students follow the requirements of the rating criteria.

5) Students scan or take a picture of your handwriting assignment and submit it via the writing website.

6) Students make sure to submit your writing assignments before the deadline.

Writing prompt 4: The fourth writing prompt was also related to a famous Chinese idiom story Dao Ting Tu Shuo (Word on the Street). The student participants were required to read the story about Dao Ting Tu Shuo: a young man heard something on the street, and he
spread the rumor to others. When people doubted his words, he responded that he heard it through the grapevine. After reading the story, the student participants were required to write an essay to briefly introduce the story. Although the story happened in ancient China around 2000 years ago, people may meet similar stories in modern society: the student participants were also required to write their experiences and views related to the *Dao Ting Tu Shuo* and provide examples to support their opinions and ideas. *Dao Ting Tu Shuo* included 844 Chinese characters and 28 new vocabularies/phrases.

1) Students write an essay to talk about your opinions, ideas, experiences, and make sure to provide examples to support your opinions.

2) Students use complex and complete sentences.

3) At least 300 Chinese characters, hand-write, please complete the essay in 50 minutes.

4) Students follow the requirements of the rating criteria.

5) Students scan or take a picture of your handwriting assignment and submit it via the writing website.

6) Students make sure to submit your writing assignments before the deadline.
### Appendix 5: Student Interview Questions

1. How would you describe your writing proficiency levels in Chinese at the beginning of the semester?

2. Aside from using the online feedback system, what writing feedback did you usually receive in your Chinese classes before?

3. In your opinion, what kind of feedback was the most effective in helping you to improve your writing abilities before?

4. What aspects of your writing did your Chinese teachers mainly focus their feedback on before? How did you deal with teachers’ error feedback before?

5. What aspects of feedback do you think are the most effective to help you improve your Chinese writing?

6. How long does it usually take to correct the errors on your 1st-draft assignment?

7. Do you think the time you spend correcting writing errors is worthwhile?

8. In the first-draft feedback, what kinds of errors did your Chinese teachers mainly focus their feedback on?

9. What do you usually do when you receive your 1st-draft feedback?

10. Which kinds of errors are difficult to correct? Grammar, word choice, sentence structure, SVO, preposition, word order, and so forth? Why?

11. Are there any kinds of errors that you do not know how to correct? How do you deal with this situation?

12. After using the computer-mediated WCF, which kinds of error feedback do you think are the most helpful and effective? And why?

13. At this stage, besides written feedback, what other forms of feedback would you want
14. What challenges did you meet when using the online feedback system?

15. Compared to face-to-face feedback, what do you think are the advantages of the online feedback system?

16. What factors influence whether or not you use teacher feedback?
Appendix 6: Survey Questions

1. How easy is it to understand the error codes?
   a. Extremely easy
   b. Very easy
   c. Neutral
   d. Not so easy
   e. Hard

2. How easy is it to understand how to use the online multiple-writing feedback system?
   a. Extremely easy
   b. Very easy
   c. Neutral
   d. Not so easy
   e. Hard

3. Views on teachers’ feedback?
   a. Extremely important
   b. Very important
   c. Neutral
   d. Not so important
   e. Not important

4. How do you feel about coded error corrections?
   a. Extremely helpful
   b. Very helpful
   c. Somewhat helpful
   d. Not so helpful
   e. Not at all helpful
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<tr>
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<th>How do you feel about computer-mediated coded WCF?</th>
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<td>a.</td>
<td>Extremely helpful</td>
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<td>b.</td>
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<td>c.</td>
<td>Somewhat helpful</td>
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<td>d.</td>
<td>Not so helpful</td>
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<td>e.</td>
<td>Not at all helpful</td>
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<th>How is the website interfaces?</th>
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<td>a.</td>
<td>Extremely easy.</td>
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<td>b.</td>
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<td>e.</td>
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<th>How is the CMS navigation?</th>
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<td>Extremely easy.</td>
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<td>e.</td>
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<th>How do you feel about the error’s statistical functions?</th>
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<tr>
<td>a.</td>
<td>Extremely helpful.</td>
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<td>Somewhat helpful.</td>
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<td>Not so helpful.</td>
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<td>Not at all helpful.</td>
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Appendix 7: Teacher Interview Questions

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<tr>
<td>1.</td>
<td>How long does it usually take to provide feedback on students’ writing assignments? What kinds of errors did students make?</td>
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<tr>
<td>2.</td>
<td>Which types of feedback do you think are the most helpful and effective to help learners to improve Chinese writing abilities?</td>
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<td>3.</td>
<td>Do you think students read and use your feedback to modify their assignments?</td>
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<td>4.</td>
<td>What types of errors do students select to ignore when they modify the coded errors feedback?</td>
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<td>5.</td>
<td>What factors lead to this avoidance?</td>
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<td>6.</td>
<td>What types of errors can the students correct successfully?</td>
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<td>7.</td>
<td>During the multiple-draft assignments, do students repeatedly make certain mistakes in their writing assignments during the whole semester?</td>
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<td>8.</td>
<td>Throughout the semester, did students ask you to provide other forms of feedback for their writing assignments? Such as instant online chat or face-to-face conversations?</td>
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<td>9.</td>
<td>What are the advantages of the online writing feedback system? And what are the disadvantages?</td>
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<td>10.</td>
<td>Do you think the time you spend providing feedback is worthwhile?</td>
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<td>11.</td>
<td>Besides written feedback, do you think other forms of feedback such as oral feedback or peer feedback could help learners improve their writing abilities?</td>
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<td>12.</td>
<td>What other suggestions do you have for improving the online feedback system to provide more effective feedback on students’ Chinese writing?</td>
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<td>13.</td>
<td>What are your perceptions of indirect, coded, computer-mediated feedback?</td>
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<td>14.</td>
<td>Have you tried to provide feedback on all errors? What factors do you consider if you provided feedback selectively?</td>
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Appendix 8: The Institutional Review Board (IRB) Approved Letter

December 6, 2016

Jinming Han
Teaching and Learning
Tampa, FL 33612

RE: Expedited Approval for Initial Review
IRB#: Pro00025773
Title: Teachers’ Views and Students’ Responses to Online Teachers’ Written Corrective Feedback: A Case of Chinese Writing.

Study Approval Period: 12/5/2016 to 12/5/2017

Dear Mr. Han:

On 12/5/2016, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents contained within, including those outlined below.

Approved Item(s):
Protocol Document(s):
Pro00025773-Protocol.docx

Consent/Assent Document(s)*:
Pro00025773_Informed Content_for_students.docx.pdf
Pro00025773_Informed Content_for_teachers.docx.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110. The research
proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, Ph.D., Chairperson
USF Institutional Review Board
Appendix 9: Informed Consent Form

Informed Consent to Participate in Research Involving Minimal Risk

Pro #  Pro00025773

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

We are asking you to take part in a research study called:
[Teachers’ Views and Students’ Responses to Online Teachers’ Corrective Written Feedback: A Case of Chinese Writing.]

The person who is in charge of this research study is [Jining Han]. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. He is being guided in this research by [Dr. Wei Zhu].

The research will be conducted at [CPR433, Department of World Languages, University of South Florida.].

Purpose of the study

The purpose of this study is to:

The study aims to explore teachers view and students respond to teacher’s online corrective written feedback in Chinese writing in order to investigate how to provide effective online written feedback. There is little-published research on how to provide effective online feedback in the context of Chinese writing development. The research aims to fill the research gap by exploring how teachers view and students respond to teacher’s online corrective written feedback in Chinese writing in order to investigate how to provide effective online written feedback.

Why are you being asked to take part?

We are asking you to take part in this research study because [We are asking you to take part in this study because you are enrolled in a 3rd-year Chinese course in the academic year of 2018.]

Study Procedures:

If you take part in this study, you will be asked to:

All the participants need to complete three essays. I will collect participants’ course work and teacher comments for the writings. You will be asked to spend about [90 minutes] in interviews.

1) All students will perform the writing but only those who participate in the study will do the survey and interview.
2) Participants will perform the writing assignments as required of all students and receive feedback. Additionally, participants will complete a survey and participate in interviews conducted at three different points.

3) The researcher will apply the multiple-draft method to help participants to improve writing abilities. I will add corrective error codes to Canvas. Students will be able to upload a writing essay to Canvas, save it, and submit it to teachers.

4) Teachers will be able to drag the codes to the students’ essays to provide code only (indirect) feedback. After reviewing the feedback, students will be able to modify the essay on Canvas and submit the edited version to the teacher.

5) All the participants need to complete three essays. I will collect participants’ course work and teacher comments for the writings. The writings will be stored in a password-protected website, only students and researchers are able to access the writings.

6) The participants will complete a survey after completing the writing assignment. The survey aims to discuss students’ perspectives on feedback and students’ reactions toward teachers’ online indirect feedback. The survey will solicit data on teaching methods, students’ identities and attitudes toward online corrective feedback, and effects of technology on their learning.

7) The participants will also need to complete three interviews at three different points. The interviews aim to explore students’ and teachers’ reflections on using the web-based writing feedback system. Based on the interview, we may find more detailed reactions to and individual reflections on using such a writing process.

8) Interviews will be conducted with the person in charge of the study. You will need to come for 3 interviews in all. Most interviews will take about 30 minutes.

[Time slots for the interviews can be negotiated and you want to keep it flexible for you and the participants.]

At each interview (total three interviews), you will be asked to: How long does it usually take to correct the errors on your 1st-draft assignment? Do you think the time you spend correcting writing errors is worthwhile? How easy is it to understand the error codes? (1----5) How easy is it to understand to use the online writing feedback system? (1----5) What kinds of errors do your Chinese teachers mainly focus their feedback on? How do you deal with teachers’ error feedback? Which kinds of errors are difficult to correct? Grammar, word choice, organization, ideas? Why? How do you deal with these errors? Which kinds of error feedback do you think are the most helpful and effective? And why? At this stage, besides written feedback, what other forms of feedback would you want to add to the online writing feedback system?]

• [All the interviews will be recorded and transcribed for analysis. Only the researcher will have access to these texts. The researchers will keep the data for five years after the study. The Chinese website is password protected and can only be accessed by the students with passwords and the course instructor in addition to the researcher. All data collected will be stored on a password-protected laptop. The data will be deleted from researcher’s laptop after the study. The information will not be identifiable.]

**Total Number of Participants**

I will conduct the study in a Chinese program at the University of South Florida. Research participants include students who will enroll in a 3rd-year Chinese course (CHI2220 and CHI2221) in the academic year of 2016/2017 and those who will enroll in a 3rd-year Chinese course (CHI3242) in the academic year of 2018. The study was originally approved to enroll 30 participants, but now seeks to add approximate 10 more student participants in the CHI3242
in the academic year of 2018.

Alternatives / Voluntary Participation / Withdrawal
You do not have to participate in this research study.

Benefits
The potential benefits of participating in this research study include:
[With the development of web-based technology for use in second language education, researchers have discovered that web-based technology can be used as a scaffolding in teaching Chinese as a second language. The study has implications for Chinese language teaching and that participants have an opportunity to reflect on the role of teacher feedback and on their revision strategies.]

Risks or Discomfort
This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.

Compensation
You will receive no payment or other compensation for taking part in this study.

Costs
It will not cost you anything to take part in the study.

Conflict of Interest Statement
[The University of South Florida and/or any of its senior officials have no potential conflict of interest related to this research (e.g. an ownership interest in an entity related to the research; a patent, trademark, copyright or licensing agreement in the test article or method being studied)]

Privacy and Confidentiality
We will keep your study records private and confidential. Certain people may need to see your study records. Anyone who looks at your records must keep them confidential. These individuals include:

- The research team, including the Principal Investigator, study coordinator, research nurses, and all other research staff.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

You can get the answers to your questions, concerns, or complaints
If you have any questions, concerns or complaints about this study, or experience an unanticipated problem, call [Jining Han] at [602-3495845].

If you have questions about your rights as a participant in this study, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent to Take Part in this Research Study
I freely give my consent to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a copy of this form to take with me.

Signature of Person Taking Part in Study

Date

Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent
I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

Signature of Person obtaining Informed Consent

Date

Printed Name of Person Obtaining Informed Consent