THE ACADEMIC WRITING OF CHINESE GRADUATE STUDENTS IN SCIENCES AND ENGINEERING: PROCESSES AND CHALLENGES

by

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ABSTRACT

This dissertation reports on a multi-case study of 15 Mainland Chinese graduate students in sciences and engineering at a major Canadian university as they wrote disciplinary course assignments and research proposals during their first two years at the university. Using data collected through multiple in-depth interviews with the individual students, supplemented by their writing samples and follow-up interviews with faculty, the study explores the writing processes and challenges of the students in completing their written assignments..

The study finds that the faculty differed considerably across and within disciplines in their expectations of the students' work. The Chinese students preferred to receive both positive and corrective feedback; however, *interactive feedback-based conferences* could be more effective. Imitating model journal articles was a common approach for the students to learn to write. One method for writing source-based assignments was modified copying as the students tried to learn to write professionally. While planning and writing the paper, the students varied along *a continuum from thinking entirely in Chinese to thinking entirely in English,* depending on their English proficiency and other factors. The students often found challenge in technical terms, varied vocabulary and sentence structures, appropriate style, thought transcription, and language flow. Even more challenging sometimes were managing information, organizing the paper, and writing the research rationale and discussion with original sentences and strong arguments. Since the students had more difficulty making sentences flow than determining the overall paper structure, I distinguish micro- and macro-level formal schemas. Further, I challenge the traditional notion of plagiarism, arguing that language reuse can be reconceptualized as a textual strategy in the development of ESL students learning and using disciplinary language and content.

Finally, I discuss the implications of my study for policy and practice in terms of institutional development, such as faculty development and curriculum development. In particular, I recommend that the university offer credit writing courses designed for graduate ESL students.

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CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 Research Problem

Despite the vital importance of disciplinary writing (i.e., writing for disciplinary courses) for academic success for university students, research on such writing by English-as-a-second-language (ESL) graduate students has been only a fairly recent phenomenon (Benesch, 1993; Cadman, 1997; Casanave, 1995; Connor & Kramer, 1995; Connor & Mayberry, 1996; Fox, 1994; Leki, 1995a; Prior, 1991, 1995; Riazi, 1995; Schneider & Fujishima, 1995; Silva, 1992; Silva et al., 1994; Swales, 1990). However, most of these studies have chosen to focus on ESL writing in humanities and social sciences (HSS), which is supposed to be highly complex and culturally challenging (Cadman, 1997; Casanave & Hubbard, 1992). Less research has studied how ESL graduate students in sciences and engineering undertake writing in their disciplines, which is theorized as having unique processes and challenges (Braine, 1989, 1995; Casanave & Hubbard, 1992). To contribute to this body of knowledge, I explore in this dissertation how some Mainland Chinese graduate students in sciences and engineering at the University of British Columbia (UBC)(a pseudonym) completed their discipline-specific writing assignments. In particular, I explore how these students approached their written course assignments and research proposals, how they composed the texts, and how they felt about the writing experience. To conduct the exploration, I use a qualitative multi-case study approach.

1.2 Rationale and Context of the Study

Large numbers of students from Mainland China are pursuing graduate studies in English-speaking countries. Many of these students study at the doctoral level. UBC, for instance, had

251 Mainland Chinese graduate students, the largest graduate ESL geographic group, representing 19.6% of the total international graduate enrolment which in turn represented 20% of the graduate population at the institution (UBC Faculty of Graduate Studies, January, 1997). Among the 251 students, the majority (54.6%) were pursuing studies at the doctoral level.

Academic writing in English at advanced levels is a challenge for most native English speakers. However, it becomes particularly difficult for ESL graduate students who come from non-Anglicized linguistic and cultural backgrounds, in particular, Chinese graduate students (Michailidis, 1996; Tu, 1994; Zhu, 1994; see below for one reason). Survey research shows that Asians in North American universities experience more difficulty in writing than other student groups (e.g., Europeans) (Casanave & Hubbard, 1992; Crowe & Peterson, 1995). In one survey, writing was perceived by almost all of the ESL graduate participants (mostly Asians) to be their greatest difficulty (Burke & Wyatt-Smith, 1996). One reason for such difficulty is the vast difference between their native languages and the target language, English (e.g., Cai, 1993; Crowe, 1992; Kaplan, 1966; Silva, 1992, 1993; Zhu, 1992), between the English they previously learned, emphasizing structural knowledge, and the English required for academic writing (Hu, 1993; White, 1998; Zhu, 1994), and between their native cultures and the target culture (e.g., Ballard & Clanchy, 1991; Bloch & Chi, 1995; Blunt & Li, 1998; Cadman, 1997; Cai, 1993; Crowe, 1992; Fox, 1994; Huxur et al., 1996; Nelson, 1993; Saville-Troike, 1989). Furthermore, while a university student is "inducted" into a particular discipline through lectures, discussions, readings, and laboratory work, it is through *written* assignments that the success of his/her academic performance is most commonly judged (Ballard, 1984; Leki & Carson, 1994; Norton & Starfield, 1997; see also Casanave, 1990). In fact, these academic and cultural challenges were so stressful that they contributed to the suicide of three Chinese graduate students in 1997, two at UBC and one at Harvard University. Not surprisingly, when I interviewed a science faculty member at UBC in 1998 (see 3.2.4), he commented, "I'm pleased to see you are doing this kind of study because I think this is one of the main issues that I see for Chinese students" (Irvin, Mar 9, 98).

Since January 1997, I have been inquiring about the programs and facilities at UBC that are likely to offer English writing support to ESL students. I searched the web sites of the Writing Centre and the English Language Institute, read their course descriptions, and communicated with the people in charge on the phone and e-mail about their courses and students. I contacted the International Student Services and the Alma Mater Society (the UBC student organization) about possible English support they offered. I also consulted the UBC Registration Guide for courses offered by the English Department. From October 1996 to March 1998 I worked as a tutor for 260 contact hours in the Spoken English Tutoring Program sponsored by the UBC Library and the Department of Language and Literacy Education, and met many ESL students - about sixty of whom were graduate students from Mainland China. My inquiry, tutoring experience, and personal observation informed me that academic writing by graduate ESL students had received virtually no support in terms of course or program offerings at the institutional level (see also 8.3.2).

That writing is important should not be taken to indicate that academic success entails merely a mastery of the English language, particularly for advanced second language (L2) writers (Benson & Heidish, 1995; Chen, 1992; Cumming, 1989; Hayward, 1994; Jacobs, 1982; Leki & Carson, 1994; Raimes, 1985; Zamel, 1982). What is also important is motivation, writing strategies, and competence in the target culture (or pragmatic knowledge of social and cultural behavioral patterns). Thus academic success at the graduate level also entails familiarity with the writing expectations of the university culture, disciplinary subcultures, course-specific subcultures, and especially instructor/supervisor-specific subcultures or idiosyncrasies (see Belcher, 1994; Frentz, 1991; Herrington, 1985; Leki, 1995b; Louis & Turner, 1991; Prior, 1991; Schneider & Fujishima, 1995). However, rather than simply adopting or internalizing the values, practices, and beliefs of the target academic community, ESL graduate writers, by force or choice, draw on personal resources, in particular their prior educational experience, and resources around themselves such as their peers. Meanwhile they struggle to resolve linguistic, academic, social, and cultural difficulties, differences, and conflicts - within and around themselves - as they attempt to meet writing requirements (see also Thesen, 1997).

There has been considerable research, since the early 1980's, on ESL composition processes by college ESL students (e.g., Arndt, 1987; Brooks, 1985; Hayward, 1994; Reid, 1984; Zamel, 1983, 1990, 1995), and discipline-specific writing processes by ESL undergraduate students (e.g., Adamson, 1993; Chin, 1991; Currie, 1993; Smoke, 1994; Spack, 1997). Only recently, as the number of international graduate students has risen rapidly and their academic problems have become more pronounced, have researchers noticed the need to study advanced levels of disciplinary literacy, particularly in graduate schools (e.g., Blunt & Li, 1998; Huxur et al., 1996; Prior, 1991; Swales, 1990). Limited research has started investigating the discipline-specific writing of ESL graduate students (Cadman, 1997; Casanave, 1995; Connor & Kramer, 1995; Connor & Mayberry, 1996; Leki, 1995a; Prior, 1991, 1995; Riazi, 1995; Schneider & Fujishima, 1995). But all of these studies, though some included Mainland Chinese participants, are situated in HSS courses, where writing is believed to be highly varied, complex, and challenging (Cadman, 1997; Casanave & Hubbard, 1992). Few in-depth studies have examined how Mainland Chinese graduate students try to complete discipline-specific writing tasks in science/engineering courses where writing is supposed to differ from that in HSS courses (Braine, 1989, 1995; Casanave & Hubbard, 1992; MacDonald, 1987). Though Swales (1990) has studied academic writing of graduate students in sciences and engineering, his research and that of his colleagues (e.g., Swales & Feak, 1994) tends to emphasize discourse analysis of the written product rather than analysis of the writing process. As Beaugrande (1982, 1984) advised us earlier, a text as the outcome of procedural operations cannot be adequately described or explained in isolation from the procedures which humans use to produce and receive it. Thus a study of the writing processes of ESL graduate students in sciences and engineering should enable us to learn more about the writers, how they proceed in writing, what challenges they encounter, how they overcome or fail to overcome the challenges, and so on. A better understanding of the students' writing processes in turn will enable disciplinary faculty to become better instructors and supervisors to these students, and enable ESL educators to improve not only their own teaching but also facilitation in disciplinary faculty development (see 8.3.1)

Worth special noting is Hamp-Lyons' (1991a) observation that native-English-speaking (NES) researchers have very little concrete knowledge about ESL writers. Yet, understanding the participants' language and culture is very important for the researcher who studies the participants (Crago, 1992). Unfortunately, almost all the investigators mentioned above are native English speakers. Few in-depth studies of discipline-specific writing of Chinese graduate students have been conducted by a researcher who shares the native language and culture of, and similar experience with, the student group in question (see also Flowerdew, 1999). Researcher qualifications such as these can be critical to eliciting more comprehensive revelation and accurate expression of the feelings, thinking processes, and behaviors of the participants, to comprehending the collected data, and to interpreting the data. My study was intended to explore this gap. In addition, my previous experience in China teaching English reading and writing to science and engineering graduate students for two years stimulated in me a deep interest in and curiosity about how Chinese graduate students in sciences and engineering attempt to write English academic assignments in Canada.

1.3 Research Questions

The main purpose of the study was to explore the academic writing processes and challenges of Mainland Chinese graduate students in sciences and engineering at UBC, specifically: how do Chinese graduate students complete the written assignments required by their academic programs, in particular course assignments and research proposals? This question may break down as follows:[1]

a) What kind of written course assignments and research proposals must Chinese students complete? What are the faculty expectations and feedback?

b) How do Chinese students try to complete the written assignments? and

c) What challenges do Chinese students encounter?

In addition to the above questions, I also sought to explore how the findings from my study might inform theories on second language writing such as those about reading-writing relations, language reuse, and thinking media in writing and writing preparation. Finally, with increasing numbers of students from Mainland China entering Canadian and other universities in the English-speaking world, I wished to make suggestions as to how these universities could meet the needs of these students, particularly with regard to their writing.

In this study I chose to focus on the writing of course assignments and thesis/dissertation proposals, rather than thesis/dissertation writing itself, because it was my assumption that Chinese graduate students usually experience more academic difficulties and problems at the initial stages of their studies than at later stages. Another reason was that it was relatively easy for me to find such student participants (i.e., those at the initial stages) as I had been working in the Spoken

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[1] I started my study with a slightly different set of research questions that included an emphasis on the effects of the change of socio-cultural identities of the students. However, as I proceeded to collect and analyze data, the questions kept evolving (see section 3.3). The data I collected seemed more appropriate to answer questions directly relating to writing processes and difficulties. They did not yield as much information as I would need in order to fully address identity issues as I had earlier proposed.

English Tutoring Program (see section 1.2 above), which attracted large numbers of Chinese graduate students, especially those who had been in their programs for only a short time. Clearly, these students were most likely taking disciplinary courses and/or perhaps, writing research proposals. It would be interesting as well to study how Chinese graduate students write their theses or dissertations. But since I did not have convenient access to those students, I did not include thesis and dissertation writing in my research focus.

1.4 Definition of Terms

I use *academic writing* in this study to refer to the writing Chinese graduate students must perform to complete their written course assignments or research proposals in their disciplines; hence, I also call such writing *disciplinary writing*. However, both these terms may have a broader meaning when I refer to other studies or to the writing by non-Chinese graduate students. In this case, academic writing can mean any writing for academic purposes such as academic course requirements and academic publication. Disciplinary writing can be writing by anybody for a specific discipline such as wood science.

Chinese graduate students are those from Mainland China only. Similarly, *Chinese language* means only Mandarin that is used by Mainland Chinese and *Chinese culture* only the culture of Mainland China or commonly practiced by Mainland Chinese.

1.5 Limitations of the Dissertation

It is important to note that the writing methods and challenges described and discussed in this dissertation represent only those of the student participants in the particular disciplinary contexts. They may not represent all those methods or challenges, for example, of writing a thesis or dissertation. Certainly, the methods may not represent those of all ESL graduate students, nor may they necessarily represent the "best methods" that all other ESL graduate students should follow. It is very likely that ESL graduate students from other linguistic and cultural backgrounds may have different writing methods and challenges. The research on the writing processes of these Chinese students is to explore issues associated with Chinese students writing disciplinary course assignments and to gain insights into these issues so that further research may be developed and other studies undertaken.

I started the study with an attempt to tap the perceptions of both the students and some faculty members. However, as the study progressed, the data collected swelled enormously. In order to adequately present, analyze, and discuss my data collected from the students as well as to make the dissertation manageable, I have to limit my primary focus in the dissertation to the students' experiences and perceptions. I use the data from the faculty only when they are appropriate to support those from the students or to strengthen my arguments.

1.6 Outline of the Dissertation

Above I have stated the research problem, provided justifications for the study, laid out the specific questions to pursue, defined key terms, and clarified some limits of my dissertation. In Chapter 2, I first review research on L2 composition as I believe the findings of this line of research should have implications for my study of Chinese graduate students who compose in English as their second language. Then I look more closely at research on L2 academic writing. In both cases, I consider how those studies might inform and inspire my study and how my research can inform the theory. While analyzing what these studies have achieved, I notice especially what they have failed to achieve, thus carving out a space for my research. Since plagiarism has been a constant and yet, highly controversial issue with ESL writers, including Chinese ESL students, I examine the research on this issue in some detail.

In Chapter 3, I argue why I employ the approach of a qualitative multi-case study to explore the academic writing experiences of Chinese graduate students. Then I describe the process in which the study developed, including the selection of the research location, study participants, and methods for data collection. I then discuss the procedures for data analysis. Finally, I offer an indication of my identity and role as the researcher because I believe such information will clarify for the reader the stance and background I come from, which are critical for determining what data I collect and how I analyze the data (see Norton Peirce, 1993, 1995b).

In Chapter 4, I present the profiles of each of the 15 Chinese student participants in the study. These profiles include brief biographical information, TOEFL (Test of English as a Foreign Language) and GRE (Graduate Record Examination) scores, educational and professional backgrounds, and academic programs of the students. I also indicate what the students felt to be their linguistic and socio-cultural challenges while studying at UBC. These stories are used to help interpret the other findings in the rest of the study.

In Chapter 5, I analyze some of the major academic assignments the students must write and describe the faculty expectations and feedback regarding the students' work, and the students' reaction to the feedback. Then I explore in great detail the methods the students used to prepare for and complete the written work on the basis of three writing stages: pre-writing, initial-writing, and post-writing, and in the course of the analysis, discuss the issues involved in the writing process.

In Chapter 6, I present the challenges the Chinese students encountered while completing their written course assignments and thesis proposals. To facilitate presentation and discussion, I divide these challenges into four categories: 1) vocabulary and grammar, 2) stylistic concerns, 3) thought transcription, and 4) information management and organization. Then, I provide explanations for the challenges from cross-linguistic and cross-cultural perspectives.

In Chapter 7, I present a theoretical analysis of some significant findings of my study, as described in Chapters 4-6, by relating them to theories and proposals in L2 writing research. I focus on three major issues. First, since the students were writing source-based assignments, I would like to see how the students perceived reading-writing relationships. Second, as the students inevitably had to reuse others' words and ideas when writing disciplinary texts in ESL, I challenge the traditional notion of plagiarism by examining the nature of writing scientific texts in an L2 and then reconceptualize language reuse by developing ESL writers. Finally, I reconsider theories and propositions on the media of thinking in L2 writing and propose my own theory on thinking media by ESL writers.

In Chapter 8, I summarize the major findings and theoretical implications of my study, and then discuss implications of my study for policy and practice in institutional development, especially faculty development, curriculum development, and ESL graduate student development. I end the dissertation by suggesting questions and issues requiring further research.

CHAPTER 2: REVIEW OF THE RESEARCH LITERATURE

In this chapter I review the literature which has a significant bearing upon my study of Chinese graduate students in academic writing. Specifically, I review research in second language (L2) composition, L2 academic writing, and the issue of plagiarism in relation to writing in English for academic purposes. Following Leki and Carson (1997), I interpret L2 composition as including two types of writing: (1) writing without a source text, in which case the writer relies on general world knowledge or personal experience, and (2) writing without responsibility for the content of a source text, in which case the writer does not have to demonstrate knowledge of the content of the provided source text but merely reacts in order to agree or disagree or to recount related personal experiences. These two types of writing are typical of current ESL writing and composition classes (Leki & Carson, 1997). Academic writing, on the other hand, is characterized in this dissertation as text-responsible, whereby the writer must display knowledge of the content, and possibly limitations, of the source text(s) and/or some other external reality (e.g., experiments, field work). In practice, it corresponds to writing in academic courses such as those in wood science or electrical engineering. Academic writing is also known as disciplinary writing (Leki, 1995a; Leki & Carson, 1997; Shih, 1986), discipline-specific writing (Casanave & Hubbard, 1992), and discipline-specific academic writing (Connor & Mayberry, 1996). In this dissertation, I use these terms interchangeably. In the last section of the chapter, I review recent research on the controversial issue of plagiarism as relates to Chinese and other students writing in English in academic situations.

2.1 Research in L2 Composition

Though as outlined above, L2 composition is different in various ways from L2 academic writing, these two types of writing do share some common issues related to writing such as: (1) the composition of sentences in an L2, (2) logical development of the text, (3) coherence and connection among sentences, and (4) organization of sentences and paragraphs. Therefore, it is important to look at what L2 composition research has to offer regarding L2 writing in general and L2 academic writing in particular.

Research in L2 composition, especially in its early stage in the 1980's, was strongly influenced by first language (L1) writing process research (e.g., Emig, 1971) and mostly oriented toward the composing process (e.g., Arndt, 1987; Brooks, 1985; Friedlander, 1990; Gaskill, 1986; Hildenbrand, 1985; Lay, 1982; Raimes, 1985; Zamel, 1983). Convinced that by studying and understanding the process of composing they could gain insight into how to teach it, researchers were eager to explore the writing behaviors of ESL students - how they generate ideas, transcribe them, and refine them in order to form a text. As a whole, earlier research in L2 composition suggested: (a) composing in L2 is like composing in L1 employing a recursive process and involving planning, writing, and revising (but see differences between L1 and L2 composition below); (b) writing is a thinking process whereby writers discover, explore, and restructure ideas; and (c) a lack of competence in writing in English results more from the lack of composing competence than from the lack of linguistic competence among advanced ESL writers (Cumming, 1989; Hayward, 1994; Jacobs, 1982; Raimes, 1985; Zamel, 1982, 1983). One explanation for (c) is that L2 proficiency such as that measured by TOEFL does not necessarily enhance the quality of thinking that occurs (Cumming, 1989). However, some aspects of L1 writing expertise transfer to, or are reflected in, ESL writing (Krapels, 1990) such as rhetorical styles, discourse structures, and attitudes to knowledge (see Ballard & Clanchy, 1991), a finding consistent with Cummins' (1981; Cummins & Swain, 1986) interdependency principle. Based on his study of bilingual education, Cummins proposes that the development of literacy-related skills in L2 is partly a function of prior development of literacy-related skills in L1. This principle implies that L1 and L2 academic skills are manifestations of a common underlying proficiency.

The influence of native language and culture on L2 writing is also captured by the construct of contrastive rhetoric (e.g., Connor, 1996; Grabe & Kaplan, 1989; Kaplan, 1966).

> [Contrastive rhetoric research studies] L1 rhetorical influences on the organization of text in an L2, on audience considerations, on goal definition...; [it] seeks to define L1 influences on text coherence, on perceived audience awareness, and on rhetorical context features (i.e., topic constraints, amount of subject matter knowledge needed to accomplish a given task, assignment constraints, writer maturity, educational demands, time available for composing, time available for feedback and revision, formal conventions of the writing task, etc.). (Grabe & Kaplan, 1989, p. 266)

This type of influence particularly concerns adult L2 writers such as ESL graduate students; any researcher who studies such writers therefore cannot afford to neglect it. Undoubtedly, exploring this influence requires that a researcher understand and be sensitive to the native linguistic and cultural characteristics of the L2 writer (Crago, 1992). For this reason, most L2 composition researchers who are native English speakers have chosen to shy away from examining such influences.

Despite the movement of composition process research, no coherent comprehensive theory has been formulated for L2 writing (Silva, 1993), nor has a consensus in research been reached when more recent studies (e.g., Atkinson & Ramanathan, 1995; Hamp-Lyons, 1991b; Johns, 1993; Leki & Carson, 1997; Silva, 1992, 1993, 1997) are included. In fact, some recent research has started questioning the application of L1 composition theory to L2 writing research. An examination of 72 reports of empirical research comparing L1 and L2 writing processes (Silva, 1993) indicates salient and important differences between L1 and L2 with regard to both composing processes, including subprocesses (planning, transcribing, and reviewing), and composing product, including features of texts such as fluency, accuracy, quality, and structure (discoursal, morphosyntactic, and lexicosemantic). For example, L2 writers spent more time assessing and analyzing the topic, did less goal setting, and generated less useful material with more difficulty than L1 writers. Producing written text in the L2 was more laborious, less fluent, and less productive. Writing was reportedly reviewed less often, and reviewed less by "revising by ear." The produced texts were shorter but contained more errors, especially with verbs, prepositions, articles, and nouns. The writing was less complex, less mature and stylistically appropriate, and less consistent and academic regarding language, style, and tone. The texts exhibited less lexical variety and sophistication and fewer synonyms and collocations. Thus L2 writing is strategically, rhetorically, and linguistically different from L1 writing (Silva, 1993). More recent research on the cultures of an ESL writing program and English L1 composition program supports this indication (Atkinson & Ramanathan, 1995; see also Johns, 1993). Thus, the prevalent assumption that L1 and L2 writing are, for all intents and purposes, the same appears untenable, despite their similarity in broad outlines. L2 writing specialists need to "look beyond L1 writing theories, to better describe the unique nature of L2 writing, to look into the potential sources (e.g., cognitive, developmental, social, cultural, educational, linguistic) of this uniqueness, to develop theories that adequately explain the phenomenon of L2 writing" (Silva, 1993, p. 669). My study of a small number of Mainland Chinese graduate students is, in part, a response to Silva's call to examine the L2 writing processes from cognitive, educational, linguistic, historical, and socio-cultural perspectives.

As the process-oriented L2 composition research discussed above is mainly concerned with psycholinguistic, cognitive, and affective variables (Horowitz, 1986) with an emphasis on the personal opinions and experiences of the L2 writers, it has neglected the context, the reader, and many other outside forces which define, shape, and ultimately judge a piece of writing (Horowitz, 1986; Pennycook, 1995). More recent research even questions the legitimacy of ESL writing with a focus on personal opinions and experiences for academic purposes (Gore, 1993; Leki & Carson, 1997; Stotsky, 1995; Pennycook, 1996a) because such writing functions to "infantilize our students, denying them a stance of engagement with serious and compelling subject matter" (Leki & Carson, 1997, p. 63) and access to "powerful genres" (Kress, 1987, cited in Stotsky, 1995). Furthermore, the processes of L2 composition are very different from those of L2 academic writing in prewriting, initial drafts, and later drafts (Parkhurst, 1990). While the emphasis of L2 composition is on linguistics and structural concerns, academic writing places content before everything else, creating a "completely different" world (Leki & Carson, 1997; see also Leki, 1995b; Leki & Carson, 1994). Awareness of the importance of the context (e.g., Zamel, 1990) and the difference in writing processes (e.g., Parkhurst, 1990) has given rise to the more recent research in ESL writing in academic disciplines, as I discuss in the next section.

In sum, while L1 and L2 writing share some similarities, the two writing processes seem to be different on many fronts. But how are they different with regard to a particular group of ESL writers such as Chinese graduate students in sciences and engineering at UBC, and how could those differences, if any, be accounted for from personal, cognitive, educational, linguistic, and socio-cultural perspectives? And how are L2 composition processes different from L2 disciplinary writing processes? Once the causes for the differences are understood, proper measures, policies, and curriculum could be designed to deal with the differences, or sometimes to tolerate them. These concerns comprise some of the issues that motivated my study.

2.2 Research in L2 Academic Writing

In contrast to L2 composition research, academic writing research takes a social view of writing by examining the context, the academic task, reader-writer relations, and interactions of the writer with the society (Casanave, 1995; Prior, 1991, 1995, 1998). However, two distinct approaches stand out in the literature (see Bizzell, 1992). One regards L2 academic writing by university students as a practice typical of novices or apprentices (e.g., Swales, 1990) whereas the other views L2 academic writing as a process that is highly complex, interactive, and historically and locally situated (see below). In the first approach, only by learning the discourse conventions of a community can students participate as members of the community (e.g., Doheny-Farina, 1989; Slevin, 1988; Swales, 1990; see also Bizzell, 1982a, 1982b, 1986). One effective way teachers can help students to successfully learn discourse conventions is to make explicit the contextual, formal, and structural features of "effective" text ("effective" in the view of the "experts") (Berry, 1989; Gosden, 1995). Hence, much of the research focuses on professors' perceptions of the writing tasks (e.g., Braine, 1989, 1995; Horowitz, 1986, 1989; Jenkins et al., 1993), professors' perceptions of academic writing by ESL students (e.g., Gosden, 1992; Pharis, 1987; Santos, 1988), and the formal or rhetorical features of academic texts of particular discourse communities, especially in the field of English for Specific Purposes (ESP) (Bazerman, 1988; Berkenkotter & Huckin, 1995; Brett, 1994; Dudley-Evans, 1985, 1994; Hopkins & Dudley-Evans, 1988; Love, 1991; Marshall, 1991; Swales, 1990; Swales & Feak, 1994; Swales & Najjar, 1987; Weissberg & Buker, 1990). Most of the studies are instruction-motivated, teacher-oriented, and text/product-based.

In general, this approach has emphasized community members' shared knowledge, values, goals, and writing conventions and described what L2 students "should" do in order to achieve academic success. However, this pragmatist approach, which tries to prepare students to meet "experts'" expectations, plays no more than a "service role" (Benesch, 1993; Severino, 1993; Zamel, 1993) that endorses traditional academic practices and current power relations in academia and society (Benesch, 1993) rather than encouraging students to question the status quo (Norton Peirce, 1995b). This approach has paid little attention to the conflicts, tension, and differences either between the L2 writer and the context (Atkinson, 1997; Cadman, 1997; Fox, 1994; Myers, 1998; Pennycook, 1996a, 1996b; Silva, 1992) or within the writer him/herself on ideological, cultural, and linguistic grounds (Cadman, 1997; Canagarajah, 1993; Leggo, 1997; Shen, 1988; Thesen, 1997). It has rarely examined how academic writing tasks are realized as concrete historical activities situated in institutional contexts and in the personal and social lives of the participants (Blanton, 1994; Casanave, 1995; Norton Peirce, 1995b; Prior, 1991). Nor has it questioned whether the apprentice-expert relationship assumed between students and teachers indeed exists, such as in the case of doctoral students, or to what extent the relationship is practiced, given the commonly large student-teacher ratio (Atkinson, 1998); or even whether the apprentices/students aspire towards integration in the mainstream culture (Thesen, 1997). According to Casanave (1995) and Cooper and Holzman (1989), the "discourse community" metaphor hides complexity. Thus Ramanathan and Atkinson (1999) conclude in their review of L2 writing research that "a notion of culture as monolithic and homogeneous does not take into account the great variety of interests, positions, and experience that exist within and between cultures" (p. 64).

The second approach, based chiefly on the works of Cadman (1997), Casanave (1990, 1992, 1995), and Prior (1991, 1992, 1995, 1998), views L2 academic writing and socialization as highly complex, interactive, and historically and locally situated, charged with tension, and therefore not fully predictable (Casanave, 1995). Hence, to understand how texts are produced and read, we need to explore the personal, social, and historical contexts of human discourse and the interactions involved in natural settings (Cadman, 1997; Prior, 1991; see also Bazerman, 1994). As these works have an immediate bearing upon my study, I will review a few key studies in some detail.

Casanave (1995) studies a culturally diverse group of first-year doctoral students learning to write and think like sociologists as they tried to complete demanding writing assignments for a core sociology course. Most of her participants were ESL students. Based on her data, she questions the one-way model of "enculturation" and the "discourse community" metaphor which implies that all members of a community share the same values, beliefs, and knowledge of issues. She found the process of course-specific writing highly complex. Much of the complexity involves the many local factors at work, such as the assignment requirements and the instructor's personality, academic interests, and preferred research methods. Rather than learning the values, practices, and language conventions as "novices" only from the professor, the students found discussions with peers and other professionals, as well as self-dialogues, important. She argues that a more meaningful approach to understanding the constructed nature of writing contexts is one that considers the immediate, local, and interactive factors that impinge upon individual students as they write in these settings, much as verbal communication is to be understood or explained in relation to its concrete situation (Todorov, 1984; see also Creswell, 1998, p. 19, for an explanation of knowledge as inextricably tied to the context). It is the local aspect of the context that helps explain why students do not seem to be socialized in uniform and predictable ways. Her findings are corroborated by other studies showing processes and expectations different from discipline to discipline (Becher, 1989; Frentz, 1991; Louis & Turner, 1991; Steinke, 1991), from one class to another within the same discipline (Herrington, 1985; Johns, 1990), and with a single professor from one student to another and from one task to another (Prior, 1991) (see also Herrington, 1988; Leki, 1995b; Zamel, 1985 for a discussion of teacher variability in writing expectations). In contrast to discourse community, Casanave (1995) suggests that the term "intellectual village" (Geertz, 1983) aptly captures the relations among the "villagers" as not merely intellectual but political, moral, and broadly personal as well.

Prior (1995) reports some of the case studies he conducted in four doctoral seminars from four humanities and social sciences (HSS) disciplines. Drawing on Bakhtin's (1986) theory of utterance genres as patterns of situated activity, he examines how academic writing tasks were cued and produced by particular students and evaluated by particular professors in particular settings over time. His findings reveal that the tasks are complexly shaped by the multiple histories, activities, and goals that the participants bring to and create within the seminars. Writing tasks are not static but constantly negotiated between the professors and students explicitly and implicitly. Students' reactions to the professors' comments on their drafts depend on what they know of the professors and how much investment they need to make in order to get a certain grade. The results of his ethnographic studies (1991, 1992, 1995) led Prior to conclude that a triangulated, ethnographic examination in sociohistoric perspectives provides a very different perspective on writing tasks and needs analysis than that inferred from texts and perceptions alone.

Cadman (1997) explores a different but challenging key issue in ESL academic writing, that of identity struggle faced by international postgraduate students writing argument texts in English at an Australian university (cf. Fox, 1994). ESL research has brought up at least two dimensions of identity. One is cultural, referring to "the relationships between individuals and members of a group who share a common history, a common language, or similar ways of understanding the world" (Norton, 1997, p. 420). It includes ideological identity based on value systems and logical identity based on thought patterns and expressions (Shen, 1989). The other dimension is social, mediated through social institutions such as schools (Norton, 1997) and referencing the subject position(s) one assumes in a society such as student, immigrant, and researcher (Norton Peirce,1995a).

By examining the students' written texts and perceptions about their writing experiences, Cadman (1997) delineates the cultural and linguistic conflicts that Asian students had to undergo as they tried to create and develop a new (cultural) identity in order to write in the required "English way." For example, Chinese students had to change their mindset from collectivism to individualism, from materialism to idealism, and slip from a modest skin into a more aggressive skin. In other words, their cultural identity underwent transformation from the "brought along" to the "brought about" (Thesen, 1997). Such a development means not only a painful loss of their native cultural identity but also the clash between the native and the new. Coupled with the loss of cultural identity is that of social identity (Norton Peirce, 1993; Norton, 2000), which Cadman only faintly alludes to, when professors, directors, researchers, or otherwise highly successful social and academic achievers in their native country are suddenly reduced to learners, "apprentices," or "novices" treated as *knowledge-deficient* and *problem-infested*. Such losses are devastating in many cases and fatal in others (see section 1.2 and Appendix F for discussions of Chinese students' suicides and cultural adaptation). Not surprisingly, some of Cadman's participants expressed the cultural clash negatively. Likewise, many ESL graduate students resisted academic writing in English, as Fox (1994) extensively documents (for more reports, see Fu, 1995; Lu, 1987; Shen, 1989). In addition, Cadman's data suggest that a significant cause of difficulty for international postgraduates in HSS programs writing English theses may lie in the different epistemologies in which these students have been trained and in which their identities as learners are rooted (see also Ballard and Clanchy, 1991). She finds that a reflexive, personal composing process in teaching contexts can help international postgraduates to build a bridge between the internal dialogue of self-review and the external challenges presented by the new academic environment.

A few other empirical case studies with participants drawn from HSS programs have also contributed to exploring the disciplinary writing processes of ESL graduate students (Connor & Kramer, 1995; Connor & Mayberry, 1996; Leki, 1995a; Riazi, 1995; Schneider & Fujishima, 1995). Unlike research of the first approach in academic writing research, most of these studies are learning-motivated, student-oriented, and process-based. They are typically conducted in HSS contexts or with HSS individuals through multiple or singular case studies. Taken as a whole, the second approach places an emphasis on how students try to meet the local writing demands and requirements, including investment strategies (those for investing time and energy according to the importance of the assignments), peer interaction, and student-faculty interaction, and how students negotiate the conflicts, differences, and tensions with the particular academic contexts and within themselves (including socio-cultural identities). It shows an intense interest in the students' personal background and personal perceptions.

Because each writing process is locally situated and unique in itself, generalizability for pedagogical practice may be limited though not impossible. In other words, it is contentious whether the findings from one study may be readily applied to other contexts - a concern of special importance to funding agencies and decision-makers. This could explain, in part, why process-oriented studies in L2 academic writing have been far fewer than their product- and text-oriented counterparts until recently. On the other hand, it is equally arguable that the insights and theories generated may be applied to other contexts and individuals, especially when the contexts and individuals have similar characteristics.

Nonetheless, in order for us to understand the nature of L2 writing, the complexity of producing L2 academic texts, and the strenuous process of disciplinary learning in general by adult ESL students, particularly graduate students, studying the disciplinary writing process is of absolute importance and urgency. In this sense, the second approach, which I take as emerging, calls for further studies with a diversity of ESL participants in various disciplines at graduate and undergraduate levels and in continuing education programs. However, a study of the second approach would be more fruitful if complemented by the first approach which may provide the written products as evidence in explaining the writing process, demystify the academic contexts and assignments through faculty perceptions, or offer a faculty perspective to triangulate students' reports (cf. Connor & Mayberry, 1996; Paltridge, 1997; Raimes, 1991, 1993).

2.3 Research in the Issue of Plagiarism

As I argued in section 1.2, academic English writing at advanced levels is a great challenge for ESL graduate students from non-Anglicized linguistic and cultural backgrounds. In a survey at one American institution with a large international population, 70% of the ESL student respondents, mostly in graduate programs, reported keeping up with writing assignments as a significant or great academic concern (Marino, 1997). The causes for such a challenge are the vast difference between their L1 and English, between the English they learned, emphasizing structural knowledge, and the English required for academic writing, and between their native cultures and the target culture. In order to deal with these challenges, or sometimes simply to complete the academic assignments, some ESL students have resorted to copying (Campbell, 1990; Currie, 1998; Pennycook, 1996b), which is condemned by the Western world under the name of plagiarism. However, some researchers have recently started to re-examine the issue of plagiarism from Chinese cultural perspectives (Myers, 1998; Pennycook, 1996b; Scollon, 1995) and/or by considering the particular context of Chinese and other students having to write in a second/foreign language (Currie, 1998; Pennycook, 1996b). Plagiarism was the theme of at least two presentations at TESOL (Teachers of English to Speakers of Other Languages) 98 which reported the results of interviews with faculty and international students on plagiarism in Britain and Denmark (Dudley-Evans, 1998; Shaw & Crocker, 1998). In the following I present some of the major findings and conclusions of this new direction of research.

2.3.1 Definitions of Plagiarism

Plagiarism is a fuzzy category (Shaw & Crocker, 1998). It seems to have various definitions and interpretations. In fact, the very same meaning of plagiarism may have to be expressed in one's own words in order for the writer not to be accused of plagiarism (except perhaps with explicit reference). (See Pennycook, 1996b, for a case in which one American university accused another of "plagiarizing" its definition of plagiarism in a university calendar.) Among the various definitions of plagiarism, the most widespread is probably one provided in the National Academy of Sciences (NAS) et al. (1995): "using the ideas or words of another person without giving appropriate credit." While this definition encompasses both "plagiarizing ideas" and "plagiarizing language" (Pennycook, 1996b, p. 223), the NAS et al. distinguish "honest errors and errors caused through negligence" from errors of "deception" (Myers, 1998, p. 3). The definition provided by Shaw and Crocker (1998) is more specific: "Prototype plagiarism is the deliberate seeking of advantage by deceptively making use of others' ideas and formulations [language] without acknowledgement" (p. 1). Both of these definitions seem to emphasize the notion of deliberateness and intention, but this notion is highly subjective and difficult to ascertain. Probably for this reason, Shaw and Crocker (1998) refer to some other ways of using others' ideas and formulations as non-prototypical plagiarism.

2.3.2 Western Views of Plagiarism

Myers (1998) believes that plagiarism, along with copyright, emerges out of Western cultural values about intellectual property. Legal enforcement of copyright laws and institutional enforcement of plagiarism rules are to ensure that individuals are rewarded for their work. The writing conventions on referencing and citation are to protect the integrity necessary for the production of knowledge. But the whole business of plagiarism is culturally determined (Pennycook, 1996b; Shaw & Crocker, 1998). It fails to acknowledge alternative practices in other cultures and different views of text, ownership, and learning (Currie, 1998; Pennycook, 1996b). Among the Western countries, "the US educational culture is extreme in its intolerance of copying" (Shaw & Crocker, 1998, p. 6). It sometimes happens that when teachers assess academic writing by non-native English-speaking (NNES) students, they look for language "that is 'too good' in order to incriminate the student," or "evidence of errors in order to exonerate the student" (Pennycook, 1996b, p. 203). So, the whole normal criteria as applied to native English-speaking (NES) students seem reversed.

2.3.3 Chinese Views on Copying

Unlike the West, traditional Chinese culture sees copying, if not "plagiarism," as a valuable and effective way of learning (Pennycook, 1996b). Copying, an unaltered representation of either source texts or source ideas, shows the learner's respect for knowledge and authority. Word-for-word copying is the most reliable means to reproduce source knowledge accurately. In order to find out how well students have learned the knowledge taught, most university courses in China, undergraduate or graduate, require students to write tests and examinations with "closed books," and thus copying from memory, or memorization, becomes a key strategy to test success (Pennycook, 1996b). In fact, the closer one remains to the original text, the more *accurate* answer one produces. While some short-term memorization is used to deal with tests and examinations (including parts of the American-based TOEFL and GRE), "memorization through repetition can be used to deepen and develop understanding" (Pennycook, 1996b, p. 222). As the Chinese saying goes, if one can learn 300 poems of the Tang Dynasty by heart, one can compose poems. I can also attest to Pennycook's observation, given my own experience in memorizing all the reading texts in the Intensive English textbook as an undergraduate English major 15 years ago. Through memorization I was able to learn more English words, expressions, and structures (grammatical and rhetorical), and could hope to speak and write English more fluently in an environment with very few native English speakers.

2.3.4 Copying as a Learning or Survival Strategy for L2 Students

NNES students who have not mastered English well enough to express themselves freely are often caught in a "Catch-22" situation. They are constantly told to write English in "their own words" (see Currie, 1998), which means either their L1, then translated to English, or their developing and far from perfect English. In either case, they are normally perceived negatively because of poor English. On the other hand, if they use words and sentences from a reliable source, such as a book, they might also be negatively perceived because of supposed plagiarism.

The source of their distress is the failure of us academics, specifically the extreme opponents of any plagiarism, to fully understand second/foreign language learning contexts or students who have to write in an L2. They may be baffled by questions such as what follows. As second/foreign language learners/users, how can they learn the content in an L2 (except perhaps through translation to the L1) without copying the words? How can they write to express the learned concept if not by copying, physically (from text to text) or through memory, to a certain extent (except perhaps through translation from the L1)? Can they invent English words and expressions as often as they might wish? Even though Chinese-speaking students can translate from their L1 when writing in English, they run the risk of being accused of using "Chinese English" or "Chinglish" (i.e., literal translation from Chinese not conforming to English usage) and being penalized. As L2 educators, we know all too well that imitation is one of the basic methods to learn an L2. Imitation and copying are not only essential learning strategies but can be the only choices for L2 students, and even L1 students, who otherwise may have no way to learn a language. Thus, Pennycook (1996b) asserts, "all language learning is, to some extent, a practice of memorization of the words of others" (p. 202), especially for adults, and "a process of borrowing others' words" (p. 227). He further suggests that "many of the ways we approach supposed plagiarism are pedagogically unsound and intellectually arrogant" (Pennycook, 1996b,

p. 227).

Copying is not only a learning strategy but a strategy which many ESL students rely upon to survive their studies at English-speaking institutions. ESL students are often faced with discrepancies between their academic workloads and their still *developing* linguistic and cognitive resources (Currie, 1998). In order to be perceived as competent students, they may "fall back on what they consider to be a 'safe strategy' as they opt for a more correct, more appropriate, more academic discourse" (Currie, 1998, p. 2). In her case study of a Chinese undergraduate commerce student, Currie (1998) finds that "staying out of trouble" through copying is the overarching strategy for survival. Moreover, Campbell (1990) finds copying to be the major strategy for both L1 and L2 university students writing from sources. Thus, Pennycook (1996b) calls on us to "be flexible, not dogmatic, about where we draw boundaries between acceptable or unacceptable textual borrowing" (p. 227). Elimination of copying, if at all necessary, is a developmental process (Britton et al., 1975; Campbell, 1990). In fact, some university instructors are already showing flexibility in both attitude toward plagiarism and practice in treating plagiarism.

2.3.5 Attitudes and Reaction to Plagiarism in Practice

Shaw and Crocker (1998), in their survey of both university faculty and L2 students in Britain and Denmark, reveal that while some disciplines show more tolerance than others toward copying, faculty in most disciplines were fairly tolerant of non-prototypical plagiarism/copying. They further note that copying is likely to be more frequent wherever people are writing in a foreign language, regardless of national educational culture. In Currie's (1998) study at a Canadian university, copying was not only tolerated but rewarded for supplying the terminology and discourse style desired by the instructor. Perhaps for this reason Currie calls the copying of her study participant "apparent plagiarism" (p. 1). As I shall discuss in more detail in Chapters 5 and 7, many science and engineering professors focus so much attention on the content when reading students' papers that they hardly care about the language as long as it makes sense. So, despite what faculty know of plagiarism, a variety of attitudes and reactions seem to be operating in practice.

In summary, copying seems to be a fairly commonplace practice for L2 students in academic writings. In order to address the issues of plagiarism more appropriately, we need to look into the causes from cultural, contextual, psycholinguistic, and pedagogical perspectives. Thus we may hope to be in a better position to exercise our flexibility in treating copying and plagiarism and to gradually have plagiarism eliminated. As the issue has been related to Chinese students (Currie, 1998; Myers, 1998; Pennycook, 1996b; Scollon, 1995), I wish to see how a group of Mainland Chinese graduate students in sciences and engineering at UBC write their academic papers in English, under what circumstances and to what extent they resort to copying, if at all, and how both the students and faculty perceive the phenomenon.

2.4 Summary

In this chapter I have reviewed literature showing that writing in an L2 is different from writing in an L1 in both process and product. Therefore, it might be misleading to apply L1 writing theories blindly to L2 situations. Further, L2 composition, that is, writing without responsibility for knowledge of source texts, is different from L2 academic writing which must display disciplinary knowledge of source texts and/or certain external realities. In reviewing the research in L2 academic writing, I have presented two approaches. One perceives students as "novices/apprentices" and emphasizes what the "expert" expects of the novice vis-a-vis the imperfections of novices' written products. This approach, however, has failed to acknowledge the strenuous processes of producing academic texts by L2 students, especially adults such as graduate students. In order to understand the complexity of L2 academic writing and the tensions involved in the writing process, it is necessary to examine academic writing tasks as concrete historical activities situated in local contexts, which I called the second approach. Finally, I have reviewed recent research re-examining plagiarism, and how copying is viewed as a learning strategy in the Chinese culture, widely practised in learning an L2, and often resorted to in order to survive L2 written assignments. Indeed, copying seems to be widely exercised by both L2 and L1 students and tolerated to varying degrees by Western university professors in practice. The major issues reviewed in this chapter will be further examined in Chapters 4-8 with respect to the Chinese graduate students in my study. The next chapter describes the research methodology and procedures of my study.

CHAPTER 3: RESEARCH METHODOLOGY AND PROCEDURES

In this chapter I first provide a rationale for employing a qualitative multi-case study to explore the academic writing experiences and perceptions of Chinese graduate students in sciences and engineering (S&E) at UBC. Then I explicate the process in which the study developed. Rather than presenting the research location, study participants, and methods for data collection in isolation, I **embed** them in my description of the development of the study. I then discuss the procedures for data analysis, and present my identity and role as the researcher in order to give some indication of the background I come from that may underlie my interpretation of the data.

3.1 Qualitative Multi-Case Study

This study takes a qualitative approach to research, aiming to uncover an emic (i.e., research participants') perspective and interpretation of the participants' experiences in natural settings. When addressing narrative inquiry, Larson (1997) observes that "narrative researchers assume that people who live these lives can help us to understand these growing concerns [problems in schools]. When we understand circumstances, events, or conflicts from other people's perspectives, we can identify and implement better strategies for addressing these problems" (p. 455). This observation can also apply to other qualitative research such as my study. Further, Flowerdew (1999) asserts that "qualitative research methodology is particularly suited to studying culture-specific phenomena, which, of course, are best investigated by people from the cultures being studied" (p. 260). Based on Bogdan and Biklen (1992), Creswell (1998), Denzin and Lincoln (1994), Eisner (1991), Geertz, 1976; Flowerdew (1999), Larson (1997), Merriam (1988), and Norton Peirce (1995b), I summarize the characteristics of qualitative research as follows: (1) an interpretive, naturalistic approach to the subject matter; (2) a primary concern with process; (3) an interest in exploring participants' meaning and understanding of their own experiences and structures of the world; (4) the researcher as the primary instrument for data collection and analysis; (5) an involvement in fieldwork by the researcher actively visiting participants and the situation to observe/record behavior in its natural setting; (6) studied use and collection of a variety of empirical materials; (7) a description of the process, meaning, and understanding in a narrative, expressive, and persuasive style; and (8) an inductive approach to build abstractions, hypotheses, or theories. These characteristics directed my study and reveal themselves in the rest of my dissertation.

In conjunction with a qualitative approach, the study adopts a multiple case study design. Johnson (1992) notes that the questions that motivate case studies often arise out of knowledge gaps or discontent with currently accepted explanations for phenomena. In my study, the motivation stemmed from a combination of these two factors. The knowledge gap, as described in Chapter 2, is the shortage of research on the academic writing experiences of Chinese graduate students in sciences and engineering by researchers who share the native language and cultural backgrounds of these students. Also, I am not content with the view of socialization embodied in the "novice-expert" and "discourse community" metaphors (see Chapter 2), since my observations and readings (e.g., Atkinson, 1998; Casanave, 1995; Ramanathan & Atkinson, 1999; Thesen, 1997) suggest that the view does not conform with reality. Further, Merriam (1988) states that a qualitative case study can provide investigators with an in-depth understanding of a problematic situation and its meaning for those involved. The problematic situation in my study is the juxtaposition of Chinese graduate students experiencing great challenges in academic writing and the lack or inadequacy of language support on the part of both faculty and the institution as a whole. Merriam (1988) asserts that the case study approach is often the best methodology for addressing problems in which understanding is expected to lead to improved practice. Yin (1994), on the other hand, states that case studies are the preferred strategy when the investigator has little control over events and when the focus is on a contemporary phenomenon whose variables are impossible to separate from their context. As I aim to explore issues involved in the academic writing processes of individual Chinese graduate students in natural settings with the ultimate goal to improve the education of Chinese graduate students in academic writing, a qualitative case study is an appropriate design. In fact, Zamel (1983) claims in her classic study of advanced ESL students that case study is "the most effective way to examine the writing process" (p. 169).

Further, Stake (1994) distinguishes between an intrinsic case study, performed because of intrinsic interest in the case, and an instrumental case study, in which a case is examined to provide insight into an issue or refine a theory, while the case itself is of secondary interest. As an extension of the latter, researchers may conduct a *collective case study* by examining a number of cases jointly in order to inquire into the phenomenon or population. Yin (1994) calls this a *multiple case study* (see also Creswell, 1998). Multiple cases are believed to lead to better understanding, perhaps better theorizing, about a still larger collection of cases (Stake, 1994). My study seeks insights into the academic writing processes of Chinese graduate students in sciences and engineering. As each case may be different, examining multiple cases is expected to generate richer insights into and better understanding of the issues involved in the writing processes without losing the necessary depth.

3.2 The Development of the Study

Data collection for the study started in January 1997 when I began inquiring into ESL support facilities at UBC, and ended, for the most part, with the last interview on April 8, 1998. The initial stage (01/1997-06/1997) aimed at an understanding of the larger social context and locating a specific academic unit at UBC as the potential research site. The main stage had two sections. The first section (08/1997-09/1997) focused on two Chinese doctoral students in Wood Science at UBC in order to pre-test and refine the research questions, methods, and interview guides. The second section (09/1997-04/1998) was devoted to collecting data from 13 other Chinese graduate student participants. A follow-up of the study (02/1998-03/1998) was meant to obtain another perspective on Chinese graduate students' academic writing from seven faculty and staff members by means of interviews. Though the study and its follow-up were completed for the most part in a limited time, the study did not cease as I wrote up the dissertation. I continued to observe the ESL support facilities at UBC, check with participants regarding my questions and interpretations, and refine my coding for analysis (Glesne & Peshkin, 1992). In fact, the completion of my dissertation will not mean the end of my research (see section 8.4). As Wolcott (1994) observes, "perhaps qualitative studies do not have endings, only questions" (cited in Creswell, 1998, p. 20). Indeed, Leggo (1997) best exemplifies this observation when he invited us to think about curriculum as narrative with 114 questions.

3.2.1 Initial Stage: Identifying the Context of the Study (01/97-06/97)

The study started with informal ongoing inquiries into the ESL support facilities at UBC, as described in section 1.2. In addition, in January 1997, I conducted a small-scale survey of ESL writing support in North American universities and colleges on WAC-L (Writing across the Curriculum List) to learn about the status quo at other post-secondary institutions. Twelve netters who were ESL teachers and/or administrators responded, representing 12 institutions, among them seven universities and five colleges, ten in the USA and two in Canada. The general conclusion I reached in the survey and posted on the discussion list was that writing support is generally well-received by ESL students. However, most respondents felt that the support was inadequate to meet the needs of the students.

In addition, I have been closely watching an e-mail list, zhong_hua@cs.ubc.ca, the community lifeline for over 500 Chinese students and scholars, the largest ESL geographic group at UBC. Messages of all varieties are posted on the list daily, ranging from looking for friends to extended debates on cultural adaptation. For example, one debate started in early May 1997 in reaction to two Chinese graduate student suicides in March 1997 at UBC allegedly due to "excessive financial and mental pressure" and "loss of belonging" (see excerpts in Appendix F). The debate centred around difficulties in cultural adaptation and strategies for coping. These messages also provided me with a sense of the level of the students' writing, albeit a different genre from academic writing.

Initially, I intended to collect data from six first-year doctoral students in one department, following work by Casanave (1995), Leki (1995), and Riazi (1995). I conducted an informal e-mail survey in March 1997 with the department graduate advisors and some students in the ten departments which, according to the directory at the Chinese Students and Scholars Association (CSSA) web site, appeared to have the largest numbers of Chinese graduate students. Then I applied the following criteria in selecting the department: (a) a large number of Mainland Chinese doctoral students; (b) requirements that students take courses involving considerable written assignments; and (c) expressed faculty/student concern over students' academic writing. As a result of that process, I decided to locate my study in the Department of Wood Science, which had 12 Chinese doctoral students at that time. However, as shown in 3.2.3 below, no Chinese students were enroled in Wood Science in September 1997, so I later had to reconsider the participant source and selection (see below). I regard these preparatory and supplementary activities as the initial stage of my study.

3.2.2 Main Stage I: Interviewing Two Chinese Doctoral Students (08/97-09/97)

I conducted the first section of the main stage (i.e., Main Stage I) of the study in late August and early September of 1997, when I interviewed two first-year doctoral students from Wood Science who had come from Mainland China, Ming and Ting (see Tables 3.1-3). I had known Ming personally before the interviews. When I invited him to participate in my study by showing and explaining to him the purpose of my study and data collection procedures (see Appendix A for a modified version), Ming readily accepted my invitation. Then he introduced me to the second student, Ting, who was both his classmate at UBC and his colleague in Beijing. The major techniques I adopted were semi-structured qualitative interviews where I was guided by, but not restricted to, a list of pre-designed questions (Marshall & Rossman, 1995; Patton, 1990) (see Appendices B and C for modified versions), and document analysis. With each participant I conducted three interviews lasting from one to one and a half hours in their offices. The first interview focused on a questionnaire on the participant's background. The second interview inquired in some detail about how the participants wrote their academic assignments and other issues related to their study in general and academic writing in particular. The third interview centred on a course paper each had written for a course and had presented to me as their writing sample. Also at this interview I solicited their comments on my study and suggestions for my further research (see 3.2.3). At the beginning of each subsequent interview I member-checked with them the information I had gathered at the previous interview/s. When offered an option to use either English or Mandarin or a combination of the two for the interviews, Ming chose Mandarin but occasionally used English. Ting used English for the most part but switched to Mandarin when he encountered difficulty in expressing himself. I simply followed them in my use of the languages for interview. All the interviews were audio-taped with permission from the participants, and afterwards, transcribed in English and analyzed. At this point I wrote up the first full-length draft of data analysis for Main Stage I and presented it to my supervisory committee on November 6, 1997.

Table 3.1: Student Participants

NAME	PROGRAM	MAJOR	ENTRY TIME	GEN-DER	YEAR OF BIRTH	TOEFL (TWE)	GRE
Ming	PhD	Wood Sci	05/96	M	1964	597 (4.0)	1910
Ting	PhD	Wood Sci	09/96	M	1966	583 (4.5)	NA
Ling	PhD	Wood Sci	09/96	F	1968	597 (4.0)	1970
Feng	PhD	Wood Sci	01/97	M	1965	603 (No)	No
Hang	MS	Forest Sci	01/96	M	1964	601 (3.5)	1680
Ning	PhD	Food Sci	09/96	M	1957	593 (3.5)	NA
Ding	PhD	Animal Sci	09/96	M	1971	603 (3.5)	No
Ping	MAS	EE	01/97	M	1969	653 (5.0)	2210
Qing	MAS	EE	09/96	F	1968	610 (4.5)	1910
Xing	PhD	EE	01/97	M	1964	627 (4.5)	2000
Wang	MAS	EE	09/96	M	1964	630 (5.0)	1800
Kang	MAS	EE	09/96	M	1970	620 (5.0)	2050
Bing	MS	Resource Eng	09/96	F	1965	593 (No)	No
Ying	MS	Audio-logy	09/96	F	1967	627 (NA)	No
Zong	PhD	Wood Sci	09/89	M	1963	580 (NA)	No

Table 3.2: Student Participants' Educational Backgrounds in China

NAME	DEGREE	MAJOR	TIME
Ming	BS MS PhD	Wood Sci Wood Sci Wood Sci	81-85 85-88 88-91
Ting	BS MS	Forestry Forestry Eng	84-88 88-91
Ling	BS MS	Wood Sci & Tech Wood Sci & Tech	86-90 90-93
Feng	BS MS	Biology Cell Biology	82-86 86-89
Hang	BS MAgronomy	Forestry Forest Genetics	81-85 85-88
Ning	BM MM PhD	Medicine Pharmacology Toxicology	77-82 84-87 90-93
Ding	BS MS	Public Health Animal Sci (UBC)	87-91 94-96
Ping	BE BE ME	Automatic Control Environmental Eng Automatic Control	87-92 87-92 92-94
Qing	BS MS	Automation EE	85-89 89-92
Xing	BS MS	Industrial Automation Control Theory & Applications	80-84 86-89
Wang	BE ME	Electronics Electronics	83-88 90-93
Kang	BE MS	Eng & Nuclear Physics Electronics	88-93 09/93-12/95
Bing	BS MS	Environmental Biology Environmental Biology	81-85 87-90
Ying	BA	English Literature	85-89
Zong	BS MS	Forestry Wood Manufacturing	79-83 83-86

Table 3.3: Student Participants' Prior Work Experience

NAME	POSITION	COUNTRY	TIME
Ming	Ass. Prof	China	91-96
Ting	Research Intern	China	91-94
	Ass. Prof	China	94-96
Ling	Lecturer	China	93-96
Feng	Ass. Researcher	China	89-92
	Visiting Scientist	France	93-95
Hang	Ass. Prof	China	88-95
Ning	Doctor	China	87-90
	Cook	Canada	93-96
Ding	Government Food Inspector	China	91-94
Ping	Ass. Prof	China	94-96
Qing	Electric Engineer	China	92-96
Xing	Ass. Engineer	China	84-86
	Engineer	China	89-96
Wang	Ass. Engineer	China	88-90
	Engineer	Singapore	93-96
Kang	Software Engineer	China	01/96-08/96
Bing	Research Assistant	China	85-87
	Research Associate	China	90-93
Ying	Tour Guide	China	89-93
	Import & Export Co-ordinator	Canada	93-96
Zong	Assistant Researcher	China	86-89

Table 3.4: Faculty and Staff Participants (Study Follow-Up)

NAME	DEPT	POSITION	CHINESE GRADS SUPERVISED THEN+BEFORE
Ellis	Wood Sci	Prof	3+3
Irvin	Wood Sci	Prof	3+12
Oates	Food Sci	Assoc. Prof	5+6
Ray	EE	Assoc. Prof	2+6
Smith	EE	Prof	3+11
Adams	EE	Prof	4+14
Vivian	EE	Secretary	NA

Though the first section of the main stage of data collection was completed in a limited period of time, I continued to interact with the participants on e-mail long afterwards, sometimes concerning my interpretations of the data. For example, in September 1998, Ming asked me to proofread his dissertation proposal which was based on the writing sample I had reviewed for him a year before.

3.2.3 Main Stage II: Interviewing 13 Chinese Graduate Students (09/97-04/98)

I started to recruit participants for the second section of the main stage of my study in September 1997. I had planned to recruit 6-10 new first-year doctoral students who would come directly from Mainland China. In order to maximize the possibility of recruiting such a number of students, I expanded the scope of my participant source to the whole Faculty of Forestry, which included Forestry Science and Forestry Management in addition to Wood Science. I decided to study doctoral students rather than Master's students because the great majority of Chinese students in the Faculty of Forestry were doctoral, providing me more chances to find the desired participants. Other selection criteria were that the students had not been abroad previously for more than three months, had come directly from Mainland China, and had decided to take courses requiring major writing assignments (such as an investigation report or a term paper) in forestry during their first term of program study. My plan was partially informed by studies such as Huxur et al. (1996) and Perrucci and Hu (1995) and my own observations, all of which indicated that international ESL students typically face more problems at the early stages of their study in a foreign country. During this period they experience environment shock, language shock, and culture shock most strongly, so they need understanding most and for that matter, offer the best opportunity for research (Stake, 1994). In addition, the participants also needed to be willing to participate throughout the longitudinal study, including data collection during their first term (09-

12/97) and follow-up interviews in January-February 1998.

However, the Faculty of Forestry did not enrol a single graduate student from Mainland China for Fall 1997. This was due partly to the increase of international graduate student tuition and partly to the lack of spaces for new international graduate students, according to the head of the Department of Wood Science. This was not at all what I had expected, given the Faculty's previous enrolment of Chinese students. Thus I had no choice but to approach other S&E departments to recruit new first-year doctoral students. Earlier, Ting, one of the participants in Phase II, had suggested that I recruit students from other departments, whom he had found to be different. Chinese Chemistry students, for instance, were more aggressive than he and his Chinese classmates in Forestry.

After contacting several new Chinese doctoral students who were introduced to me by the CSSA or who came to the Spoken English Tutorial Program for which I was a tutor, I found that most either had little required writing to do or were too busy to commit themselves. I ended up with only one doctoral student from Botany. However, some new Master's students whom I met at the Spoken English Tutorial expressed interest in being interviewed. As I already felt that new students would not have much academic writing experience to talk about, I decided to recruit six "old" students who (1) had come from Mainland China (directly or indirectly), (2) had been studying in either a PhD or Master's program at UBC for at least six months, and (3) had done or were doing considerable writing for their course work. By "considerable" I meant at least two term papers or one term paper plus some other minor assignments such as lab reports. As I had started interviewing the six new students, I did not give them up at that point. Like the new students, the old students came to attend the Spoken English Tutorial and agreed to participate in my study after I inquired about their academic writing experience at UBC and invited them to take part in my study (see Appendix A for Informed Consent Form). These participants were from several S&E departments such as Electrical Engineering, Botany, and Metals and Materials.

I included 12 of them, in the event that some might drop out of the study. But after the first round of interviews, I had to abandon the new students because unlike the participants in Casanave (1995) or Leki (1995), they typically had very little writing to do for the courses they were taking during their first term at UBC. One told me her advisor deliberately allowed her to postpone her written assignment for her Directed Study because she was having language difficulty. Since these new students had just started their studies in Canada, they had had very little writing experience to talk about. It was clear that they would not be able to supply me much of the information I needed for my study within the time I planned for my project. So in order to collect rich data needed for my study, while retaining the six old students: Ling, Feng, Ning, Ping, Qing, and Xing (see Tables 3.1-3), I recruited six more of the "old" category: Hang, Ding, Wang, Kang, Bing, and Ying (see Tables 3.1-3). I did so by revisiting the student record files for the Spoken English Tutorial Program from the previous year when I began as a tutor for the program. I e-mailed my invitation to 10 candidates (see Appendix A) and selected six who replied positively and who met the three criteria mentioned above. It is worth noting that S&E graduate students in general have far less written work to do for their courses than their humanities and social science counterparts. The two departments that furnished the largest numbers of the 12 participants were Wood Science and Electrical Engineering. The other departments were Forestry Science, Food Science, Animal Science, Audiology, and Bio-Resource Engineering.

Zong (see Tables 3.1-3) came to my study through special circumstances. Unlike any of the 14 student participants I had studied, Zong was highly recommended to me for his exceptional academic success by a faculty member in Wood Science whom I interviewed the study follow-up. The faculty member suggested that I interview Zong to find out what study strategies he used when he was a graduate student in his department. Zong was now a shining young scientist at a research institute on UBC campus. Deeply intrigued by his success in his graduate studies, I decided to include him in my study even though he was no longer a student. Thus my study evolved even further, unexpectedly but logically. While writing up my research, I felt obliged to include Zong, as Leggo (1997) reminded me, "we need to honour the multiplicity and meaning-making and mystery that are at the heart of the searching in our research" (p. 3).

The methods I used for data collection in this section were largely the same as those adopted in the first section, but I had refined the interview guides (see Appendices B and C) and added another list of questions (Appendix D) in case I needed them for the final "free talk" I planned. I had learned from my instructional experience that due to their education in China, most Mainland Chinese students in sciences and engineering would not talk on occasions such as my interview unless they were asked questions. Even when questions were posed, they would usually stick to the questions and seldom go beyond to other topics. "Free talk" in the sense of "talking about anything you like" would not work with most of these students, so I always carefully prepared questions in advance of each interview.

From September 1997 to April 1998 I conducted five interviews with each of the five participants (Hang, Ning, Ping, Qing, and Bing): one based on Appendix B, two on Appendix C, one on Appendix D, and another on the participants' sample writings; four interviews with three participants (Feng, Xing, and Wang): one based on Appendix B, two on Appendix C, and one on Appendix D; three interviews with two participants (Ding and Ling): one based on Appendix B and two on Appendix C; three interviews with one participant (Kang): one based on Appendix B, one on part of Appendix C, and one on a combination of the remaining part of Appendix C and Appendix D; two interviews with one participant (Ying): respectively based on Appendices B and C, and one interview with one participant (Zong): based on a condensed combination of Appendices B-D. All the interviews were conducted in the seminar rooms in the Education Building at UBC except in the case of Feng, Ying, and Zong who preferred to meet me in their offices. Normally, the interviews each lasted one hour to one and a half hours. But the interview with Zong and the second interview with Ying each lasted two hours. Instead of an interview, Ying had time only to respond to Appendix D on e-mail. The great variety in the number of interviews and use of my interview guides was due to the time each participant had available for interviews and their varied degrees of interest and ability to talk. While they all showed interest in participating in my study, some were more active and enthusiastic than others. The case of Zong was special: I only intended one interview with him as he was very busy.

I audio-taped all the interviews with their permission, and then transcribed all of them - a total of 57 hours for this section. Though the participants were offered an option to speak Mandarin, all chose English to respond though all used isolated Mandarin phrases on occasion and some of them resorted to Mandarin for short segments of the interviews. I normally followed their choice and switched to accommodate them.

They all appreciated being interviewed and having the chance to practice their oral English. Zong even valued the interview as his first opportunity to discuss learning English which he regarded as his hobby and at which he excelled: "I don't know if I do it right. I never had such a chance to talk with other people about my learning language" (April 8, 98). When I asked whether speaking English affected their expression of ideas (see Appendix C), they all replied negatively because they felt relaxed and comfortable during the interviews, able to say what they wanted to in a variety of English that made sense to me. This is in congruence with Bourdieu's (1977) position that "when people speak, they want to be in a position to command the respectful attention of their listeners. In the absence of such attention, learners not only become anxious, but they begin to question their own self-worth" (Norton Peirce, 1993, p. 226). On occasions when they indeed had difficulty expressing some concepts in English, they resorted to Mandarin. Even the awareness of having Mandarin as a second choice and/or talking with a bilingual who was or had been their tutor raised their comfort level. The following interview segments illustrate my points:

> J: Why did you choose English to answer my questions?
> W: Because I think it's an opportunity for me to practice my English. As a matter of fact, if I make some mistakes or if I can't express myself, you can help me at once.
> (Interview with Wang, Dec. 4, 97)

> J: Why did you choose English to answer my questions?
> L: I want to take this advantage to practice my English because for us, you know, in UBC there are so many Chinese students here. If you don't practice English so much, you can speak Chinese every day.
> J: I see.
> L: You don't have any chance to speak English.
> J: Do you feel using English interfered with your expression of ideas so far?
> L: No.
> J: Why not? So whatever you want to say, you have said it?
> L: Because if I have some problem, I will use Chinese. So, If you are English student, maybe I will feel a little nervous, I will not speak so free to talk to you because I think, OK, maybe my English is not so good, making mistake, they will think about my language problem. But for you because you can speak Mandarin and English for me, I feel so free to talk with you in English. Even I cannot express myself, I think I can use Mandarin. In Chinese say, 'ni you yi tiao hou lu' [you have a way out in the back].
> J: You have something to fall back on. Right. We did in a few places, 98% we used English. That kind of feeling gave you confidence, I guess.
> L: Yeah.
> (Interview with Ling, Jan. 10, 98)

In addition to the interviews, I collected course outlines, writing samples of lab reports, term papers, project reports, and thesis/dissertation proposals from the participants. I made sure to get at least one writing sample from each participant except Zong. The samples from Ning, Ping, Qing, and Bing were to be submitted to the faculty while those from the others were past assignments. I offered to proofread or review their writing samples and discuss my comments and suggestions with them. They all accepted my offer except Ying and Kang, who seemed too busy to review their past assignments. They appreciated my comments from an experienced English teacher's point of view and liked the one-to-one tutorial-style interaction when I discussed my comments with them. In fact, partly due to my proofreading and suggestions for rehearsal, Ning was able to pass his extremely tough comprehensive exam (see section 4.6 for more details).

I had asked the participants to write e-mail journals, but none was able to do so. However, we often relied on e-mail to make interview appointments, ask each other questions, and perform other daily communication functions. Ning, in particular, asked me to correct the mistakes in his e-mail to me.

> N: Whenever I write e-mail to you please correct my mistakes.
> J: You don't mind being corrected?
> N: I prefer so.
> J: If you like it, I'll do it for you.
> N: Writing e-mail is a learning opportunity.
> (Interview with Ning, Dec. 5, 97)

Sometimes I used e-mail to ask for further information or member-check with the students to clarify my understanding of the interview data.

It was during Main Stage II that I started a research log to record my thoughts of the moment, striking interview quotes, useful references and quotes from literature readings, and ideas for organizing the dissertation. I found the research log to be of great value in helping me manage the important information needed for such an extensive research project.

3.2.4 Study Follow-Up: Interviewing Faculty Members (02/98-03/98)

In order to create a dialogue between the student participants and the related faculty as well as to obtain another perspective on Chinese graduate students' academic writing experiences, in February 1998 I invited via campus mail the participation of 17 faculty members who were (co)supervisors and/or course instructors of the student participants. Surprisingly, after a lapse of two weeks only two faculty members (Oates and Adams[2]; see Table 3.4) replied to my invitation. I re-sent the invitation by e-mail and gained five more positive replies (Ellis, Irvin, Ray, Smith, and another faculty member) and seven negative ones. The rest did not respond. I made an appointment with each of the seven faculty members and held an hour-long interview with each of them in their own offices except Ray. Ray offered to meet me in a seminar room. During the interviews, I was assisted by a guide which I brought along, but the interviews often explored far beyond the guide. All the interviews were audio-taped with permission from the faculty participants. Of the seven interviews, six turned out to be useful. Smith kindly introduced me to a graduate secretary Vivian and suggested that Vivian was a right person to talk to regarding the study difficulties of Chinese graduate students. So I briefly described my research, obtained a quick consent, and interviewed Vivian without the benefit of an interview guide for half an hour. This and the other six interviews were transcribed afterwards.

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[2] As with the students, pseudonyms are used for all the faculty and staff members who participated in the follow-up.

Apart from the interviews, I visited the home pages of all the related departments and faculty participants. These home pages provided me with an understanding of the program requirements and academic contexts for my student participants and points of reference for my interviews with the faculty.

3.3 Procedures of Data Analysis

In congruence with the tenets of qualitative research (e.g., Denzin & Lincoln, 1994; Lincoln & Guba, 1985; Merriam, 1988; Meloy, 1994; Norton Peirce, 1995b; Strauss & Corbin, 1990), I adopted an interpretive, inductive approach in my treatment of the data. That is, I read and reread the transcripts of the interviews and other collected documents to search for recurrent themes. Specifically, for Main Stage I, I coded the transcripts on paper, searched for interrelationships between codes, and then for the themes and subthemes. I then pooled the segments with the same codes together in my discussion of the themes and in an attempt to address the questions I asked at the outset of the project. The research questions I asked and the interview guides I employed greatly influenced my induction of the themes. I felt that I did not have total freedom to treat all the data equally but felt obliged to search for answers to the research questions. However, this does not mean that I found satisfactory answers to all the questions. For instance, based on my review of the literature (e.g., Leki, 1995a; Prior, 1991, 1995; Riazi, 1995) I had asked the following question, among others, in my research proposal and for Main Stage I: "How do the students react to faculty response?" I had assumed that the faculty in Wood Science would provide plenty of feedback on the students' written assignments as did the faculty studied by Leki (1995b), Prior (1991, 1995), and Riazi (1995), and the Faculty of Education at UBC. But as it turned out, the instructors offered very little feedback, and as I discovered in Main Stage II, that is rather common with science and engineering instructors. What is more problematic is that many of them simply did not return students' assignments (see Chapter 5 for more discussion). So, while still maintaining my interest in exploring students' response to faculty feedback, I removed the question as a major research question but instead went to the faculty with questions such as why some of them did not provide feedback (see section 1.3 and 3.2.4). Thus it is also true that while the research questions I had asked guided my data collection and analysis, the former did not control the latter. In "inquiry-guided" (Mishler, 1990) research, "research questions and answers evolve[d] in a mutually informative, dialectical manner" (Ramanathan & Atkinson, 1999, p. 53). Creswell (1998) also suggests that our questions are modified during the process of research to reflect our increased understanding of the problem.

The analysis of the data in the interview transcripts for Main Stage II was much more elaborate than that for Main Stage I. While reading and rereading the transcripts, I coded in pencil meaningful segments on paper and in the meantime, wrote the codes in pencil on a large spread sheet which allowed me to see all the codes on one surface like an unfolded map (see Appendix E for a final coding system). Having all the codes on one map enabled me to compare the codes and categorize them as I added more or moved them around as necessary. Often I had to rename or modify the codes to stay closer to the meaning conveyed, to merge themes, or avoid confusion with other codes. For example, I changed "suggestions for my study [SGS]" to "participant suggestions for my study [PS]." I dropped "language preparation in China [LPC]" and "teaching methods in China [TMC]" to merge them with "English education in China [EEC]." I had to change "[MI]" initially standing for "motivation/investment" to "[M]" to make room for [MI] which I thought would better stand for "methods for interview." Modification of the coding system continued throughout the process of analysis (see Glesne & Peshkin, 1992), whenever a new theme emerged or a new understanding of a theme necessitated recategorization. After I coded all the transcripts on paper, I coded them again in my computer file while continuing to refine the coding system. It is worth noting that each modification of the codes or the system signified a deeper understanding on my part of the data. Out of the individual files, I was able to build several larger files which allowed me to easily search for all the segments, or as many as necessary, under one code - without losing the context of the segments which I often had to refer to in order to help interpret the segments.

3.4 My Role as Researcher

One characteristic of qualitative research is that the researcher is an instrument for data collection and interpretation (Lancy, 1993). As such, the kind of data collected and the interpretations made of the data are dependent on the researcher's interest and understanding of the particular historical context (see also Norton Peirce, 1993, 1995b). While summarizing the tenets of critical research, Norton (2000) and Norton Peirce (1993, 1995b) points out that critical research, and I think all qualitative research, rejects the view that any research can claim to be "objective." In order for the audience to have an accurate understanding of what I collected and how I collected and interpreted the data and to judge the acceptability of my interpretations, I must explain who I am and what role I assumed in the research.

3.4.1 Who Am I?

I pursued a B.A. in English Language and Literature at a comprehensive university in East China from 1979 to 1983; my primary interests were grammar, rhetoric, and writing. Upon graduation, I was assigned to teach English as a foreign language (EFL) at a local key technology university. After one term of teaching undergraduate engineering students I was asked to teach EFL to graduate students in sciences and engineering. Though I taught all the language skills, my emphasis was on reading comprehension, grammar, and writing (composition). Two years later I returned to the same comprehensive university to complete a three-year Master's program in English Language Studies, and thereafter, resumed my teaching at the technology university. Like tens of thousands of other Chinese students and graduates, I took TOEFL in 1989, earning a score of 650 out of 677. Two years later I was able to enter the Master of Education program at The University of Eastern Canada (UEC; a pseudonym) with a graduate teaching assistantship.

In my first term at UEC, I was overwhelmed by the amount of literature I was supposed to read for the three courses I was taking and the number of written assignments I had to complete - one critical analysis every week and one major paper every other week on the average. In China I was accustomed to intensive studies of limited readings and non-source-based (i.e., without referring to sources) compositions. Despite my strong language foundation from China and the fact that I had written my first Master's thesis in English, I found it difficult to write the assignments at UEC with the required format and structure specifications. Fortunately, I had some Chinese friends who had taken similar courses before and who were willing to loan me their written work as models. Partly because of these models and the detailed instructions in the course outlines, I was able to earn 85-91% as marks for all the courses. Before I left UEC I had had two articles accepted by a journal and co-authored a book chapter.

I came to the PhD program in Curriculum and Instruction at UBC in 1993. However, while I was prepared for a culture shock at UEC, I was not expecting the academic culture at UBC to be different from that at UEC. Possibly due to its huge geographical, if not demographic, size, I found greater distance between people at UBC, both physically and socially. Nevertheless, UBC had much better computer and electronic mail facilities. These facilities enabled me to communicate freely and efficiently with individual members of the community on and off campus and to join several academic discussion lists such as qualrs-l@uga.cc.uga.edu and a large number of community lists such as zhong_hua@cs.ubc.ca. Thus I read scores of e-mail messages and write many on a daily basis.

My e-mail with two doctoral students is worth mentioning. After I met Helen, who came to my presentation at the TESOL conference in Seattle in March 1998, I started a series of e-mail discussions on the writing and cultural problems of Chinese students with her. Helen was researching for her dissertation the writing experiences of six Chinese graduate students in education at Harvard University. We were soon joined by a third doctoral student researcher, David, from The University of Illinois at Chicago. David had taught English in China and was working on his dissertation research in composition writing by Asian students. The discussions helped clarify some important issues related to my research such as student-conference, interaction, student-teacher relationships, and professionalism (see Appendix G for sample excerpts). The academic e-mail lists, on the other hand, provided me timely input on issues involved in qualitative research in addition to the books I had read. Some of the discussion and debate topics were "generalizability," "grounded theory," "triangulation," "coding," and "researcher as instrument." These discussions proved very helpful for my research.

E-mail, and to a lesser extent, world wide web more recently, are the primary channels through which I interact and keep myself connected with the outside world. If people at UBC are physically distant from one another, e-mail has undoubtedly made it appear less so. The more laudable value of e-mail, however, lies in the connections, communications, and integrations that I have benefited from not only with the on-campus community but the off-campus and international community - on academic, social, and even emotional grounds. As such, e-mail has been an essential and invaluable tool in my research process.

3.4.2 My Role as Researcher

As researcher, I was first and foremost an interviewer as interviewing was the primary method for the data collection. Being a graduate student from Mainland China with Mandarin as my L1, having experienced a culture very similar to that of the participants, and being in the same age group of 25-40, put me on a relatively equal footing with the student participants. That is one major reason why these participants felt comfortable throughout the interviews and could express themselves mostly in English, their L2. The following segment from an interview with Wang is one such illustration.

> J: Do you think speaking English, your second language, would affect your expression of feelings, ideas? Like during the conversation with me?
> W: No.
> J: Do you have any difficulty expressing what you want to say, your feelings, emotions, ideas?
> W: Sometimes I can't find proper words to express myself.
> J: Do you think that affected your talk with me?
> W: No.
> J: How come?
> W: I can say that when I talk to you I feel even more comfortable than talk to other native English speakers.
> J: How come?
> W: Maybe because we have the same background.
> J: A lot more understanding between us.
> (Interview with Wang, Dec. 4, 97)

When he indeed could not find proper words, he would use alternative, if less appropriate, expressions, or I would offer suggestions to help out (see below). The relatively equal footing and resulting comfort afforded me an advantage to develop the rapport and trust necessary for case study and process-oriented research (Stake, 1994). Further, I was a spoken English tutor for most of them; also, I assured them that the data collected from the one-on-one interviews would be kept strictly confidential. For all these reasons, the student participants were very open and frank with their experiences, difficulties, and perceptions, at least as it seemed to me. The tape-recorder did not seem to distract them at all. On the other hand, because I had taught English to other Chinese gradate students and had been in constant contact with the Chinese student community orally and electronically, I was often able to detect what the students were trying to express when they had difficulty doing so, as shown in these two illustrations.

> J: The academic culture, the way people talk, the way people write.
> P: I'm always trying to find out what's their -
> J: - their way of doing it? The general term is culture.
> (Interview with Ping, Nov. 29, 97)
>
> X: But maybe at the beginning of the term, the teacher didn't give all these things. Maybe the students are not fully -
> J: - aware?
> X: Aware of the burden, the load.
> (Interview with Xing, Nov. 18, 97)

As researcher, I was more than an interviewer. In my Informed Consent Form (see Appendix A), I promised the potential student participants that in return for their participation I would act as a resource person to help them with their cultural and academic adjustment difficulties. So, I carried over my capacity as spoken English tutor by offering advice to overcome their difficulties. For example, when Ning and Qing expressed their concerns over oral presentations, I advised them to rehearse, which they tried with very positive effects. Bing wanted an assignment back but the instructor never returned students' papers. I told her to go to the instructor's office and ask for it. This enabled her to retrieve her assignment. I also offered to proofread papers which they were writing or revising. Ning, Ping, Qing, Bing, Ding, and Xing each presented me with at least one such paper. Ming, Ting, Ling, Feng, Hang, and Wang produced past assignments. I read each paper carefully and made suggestions to correct grammatical, rhetorical, and editorial errors or to improve the structures and expressions. Then I would meet with each participant and explain how and why I made those suggestions. The participants were very appreciative of my feedback since they did not often receive much feedback from their faculty. (See Chapters 5 and 6 for more discussion of the students' writing difficulties and problems and student perceptions on faculty feedback.) For illustration at this point, I reproduce Ning's salient metaphor.

> Sometimes you need feedback. That's very important. Feedback not means you really point out that point. But feedback is in one sense to me encourage. It's source of energy. No matter whether this is something right or wrong, give me energy, OK?
> (Ning, Dec. 5, 97)

Thus as "academic consultant" and tutor, I directly participated in the construction of the student participants' academic experiences, albeit to a very limited extent. Furthermore, the interviews served as venues for exploring the participants' academic experiences in order to reach a better understanding for them and me. In the case of Ning, the interviews provided a foundation for knowledge construction, as illustrated in the following:

> N: No, when I talk to you, most like I talk too much. Sometime when I talk, it also organize my thought. Also clear my experience.
> J: Clarify your thoughts, reorganize your thoughts.
> N: Reorganize my thoughts, yes. Sometimes when something happened, I didn't pay attention to. When I talk to you, it's all things came together.
> J: You become more conscious as you reflect on them.
> N: Became conscious, became theory, become refined. Become refined experience or refined knowledge or something like that.
> (Interview with Ning, Jan. 2, 98)

Therefore, as researcher, I sometimes worked with the students as they sought to articulate their ideas.

3.5 Summary

In this chapter I have argued for the adoption of a qualitative multi-case study to explore the academic writing experiences and perceptions of some Mainland Chinese graduate students in sciences and engineering at UBC. Such a study affords both the depth and breadth necessary for my search for insights into the academic writing processes and issues. Then at great length I have explained the development of the study, especially the second section of the main stage. As typical of qualitative research, the development took an emergent course. In order to accommodate and make use of the unpredictable circumstances, I had to adjust and re-adjust my methods for data collection and analysis. In the explanation, I have chosen to embed the introduction of the research location, participants, and specific methods in the description of the development instead of following a traditional approach to display them discretely. Finally, I have presented an introduction of who I am and what roles I took in the study to aid readers in their interpretation of my study.

CHAPTER 4: PROFILES OF THE STUDENT PARTICIPANTS

In this chapter I present a profile of each of the 15 Mainland Chinese student participants (see 3.2.2 and 3.2.3). Although Zong, the last of the 15, was no longer a student when I interviewed him, I included him because our interview conversation was largely about his experience as a graduate student at UBC. Each of the profiles includes brief biographical information, TOEFL and GRE scores (where available), prior educational and work backgrounds, academic studies at UBC, especially language challenges, and other relevant non-academic experiences and thoughts in Canada. The information is drawn mostly from my first interviews with them but also other interviews. These stories are meant to help interpret the other findings in the rest of the study. I end the chapter with a summary of the profiles.

4.1 Ming

> I think it's [my research in China] all useless. It all belonged to history. No matter how good your academic background in China was, once you come here, you have a 'blank page.' (Ming, Aug. 25, 97)

One of the participants, Ming (see Tables 3.1-3), came from Beijing, where he worked at a research institute in 1991-96. Ming was in his early 30's and appeared quite fit. His highest position before leaving China was associate professor. Previously, Ming had completed his studies at a forestry university in East China where he obtained a B.S., an M.S., and a PhD degree, all in Wood Science. The language of instruction for all his undergraduate and graduate courses was usually Chinese. He seemed to be very strong in his academic preparation and research career. By the time of his departure for Canada, he had published about 20 articles in national journals and written 40 entries for a dictionary of materials. Four of these articles were co-authored with his doctoral supervisor and five had been out before the completion of his PhD in 1991. It was a requirement of the university that doctoral candidates publish at least three articles before graduation. As they were published in China, all the writings were in Chinese. When I praised him for his accomplishments, he appeared rather modest, explaining that it was normal for researchers at the institute to publish a large number of articles. Ming did not have any international publications. He had not been out of China except for a week-long visit to India prior to his departure for Canada.

Ming entered the PhD program in Wood Science at UBC in May 1996 with a TOEFL score of 597 (out of 677). Despite his academic and professional accomplishments in China, Ming did not appear proud. Instead, he assumed a very pragmatic attitude toward being in Canada. In order to be a student, and then a research assistant, of a supervisor who was working on a theory-oriented project, he had to forget about the research he had previously done on the applications of wood-bamboo composites. Hence, he made the comment at the outset of this section, "I think it's [my research in China] all useless...No matter how good your academic background in China was, once you come here, you have a 'blank page'" (Ming, Aug. 25, 97). The following quote from our interview further reflects Ming's frustration over the lack of proper recognition of his past academic achievements as well as his disappointment at and struggles with his English skills.

> Let's take it the opposite way. Say he is learning Chinese and is a graduate student in China and I am his professor. I'm sure his level of abilities are much lower than mine here. We often make the joke that if I have money, say $2 million, I ask you to be my graduate student and learn Chinese for five years. Then I will test you on Chinese EPT [a hypothetical Chinese test equivalent to English Proficiency Test used in China]. I make you write Chinese papers and then mark with crosses and circles. It's true that some 'lao wai' [foreigners] make such marks on some Chinese students' papers. If I had $10 million, I could have you be my student. Wouldn't you accept it if I gave you more funding, say $200,000 a month? The condition of being a student is that you learn Chinese and pass all kinds of exams. Sometimes we feel unhappy about it. The difference between us is that they have a better grasp of the language. Mainly language.
> J: In terms of scholarship, you are no less good than them.
> M: Very similar. They probably have a little better technologies and computer uses. Otherwise, we are similar.

> (Interview with Ming, Aug. 27, 97)

Ming thought that the level of his research and disciplinary knowledge could match that of his professors. What distinguished him and his professors was mainly the language of his discipline at UBC.

Ming had wanted to find a job in Canada. But since the chances in his area were very small, he had to keep on pursuing (his second) PhD research. Thus he could secure some financial support and earn his North American credentials while waiting for employment opportunities.

During the previous 15 months, Ming had taken five courses, four of which were in the Faculty of Forestry. For these courses, he wrote numerous reports and papers. The most representative, however, was a 36-page paper he wrote for a Directed Study. I made a copy for document analysis. Though he complained about his difficulty in expressing himself orally, he did not do so about his writing. But as suggested above, this does not mean that he was free of writing problems. I will discuss the writing problems of Ming and other participants in Chapter 7.

4.2 Ting

> When I took exams, I had correct ideas. But when I put them on paper, they meant different things. (Ting, Aug. 27, 97)

Another participant, Ting, worked at the same research institute in Beijing as Ming did during 1991-96 before coming to study in Canada (see Tables 3.1-3). Ting was in his early 30's. He obtained a B.S. in Forestry and an M.S. in Forestry Engineering at a university in Beijing. He received his pre-university education in Inner Mongolia, one of the most underdeveloped remote areas in China. The highest position he held in China was assistant professor. He co-authored two articles published in a national journal based on his Master's thesis research on non-wood-based particle blocks. Now he was expecting to have one or two papers published in an authoritative journal in Germany.

In his undergraduate studies, Ting received his education almost exclusively in Chinese. He had English as a foreign language (EFL) for two years, six hours a week. His English teachers were Chinese, some of whom had previously shifted from teaching Russian. The teaching methods were largely grammar-translation of "scientific English" (easy science readings). He learned very little practical English. While in the Master's program, he continued to have his specialization courses taught in and by Chinese. However, during this time he was fortunate to have American teachers for most of his English classes, including listening, speaking, and writing. These English classes met for a total of eight hours a week for one and a half years. It was in his graduate years that Ting really began to learn some English. Partly for this reason, he was able to perform well in his English tests later on.

Ting entered the PhD program in Wood Science at UBC in September 1996 with a TOEFL score of 583. He had also written the GRE and scored 560 (out of 800) on the verbal part, which is remarkably high. He lost next to nothing on vocabulary. However, since he memorized words mechanically right before the tests, he had a limited understanding of how to use them in other contexts. Before long, his memory of the words faded. That is why he still had difficulty with the everyday meanings of many words, though his grasp of such meanings as applied to his specialization was functional. He compared his level of listening comprehension to that of an elementary school student.

> When I was in class, I felt I understood. But after class I forgot everything. I don't have anything in my memory. This lack of memory suggests I was listening at the level of an elementary school student to the lectures of a professor. (Ting, Aug. 27, 97)

But how could Ting still survive the courses he had been taking? He owed his learning to cognitive thinking in Chinese. But in courses which required much English description, his cognitive thinking lost its advantage. So writing was still one of his big problems, as he admitted: "When I took exams, I had correct ideas. But when I put them on paper, they meant different things....And yet, you didn't realize that in your writing" (Aug. 27, 97).

Ting had taken five credit courses and audited another. Four of the credit courses were offered by the Faculty of Forestry. Among these four, two courses were especially relevant to my study. One course, a doctoral seminar, required writing and presenting a grant proposal, which would then be read and marked by three professors. Because it was the first time Ting wrote a formal paper at UBC, his proposal revealed a good number of problems such as grammar, spelling, punctuation, clarity, and format (see Chapter 6 for a discussion of the students' writing challenges). The paper he wrote for a Directed Study, he reiterated, was longer and better. But unfortunately, it was not available since he had loaned it to another student. I made a few more inquiries about the paper afterwards, but he never said the paper had been returned. Ting appeared very humble. Whenever something went wrong with his language in listening, speaking, or writing, he would take it to be his own fault. He seldom blamed his professors. Yet, in China it is not uncommon to hold the teacher responsible for the student's academic well-being (or the lack thereof). Teachers are often blamed for not being strict enough with students and for not driving students to work hard enough in and out of class.

Ting was very pessimistic about job prospects. In his words, finding a permanent job related to his area of study was "not hard in the usual sense but extremely hard, almost impossible" (Aug. 27, 97). This loss of hope doubtlessly had a negative impact on his studies, plunging him into a state of uncertainty concerning whether to continue his current program or to shift to a more practical area. The latter option would likely find him short of both academic preparation and institutional financial support, the means for his day-to-day living. To my knowledge, Ting was just one of many Mainland Chinese graduate students struggling with the dilemma over the conflict among academic interest, financial support, and job prospects, especially at the doctoral level.

4.3 Ling

> In China even if I got some general chemistry education, it's just Chinese, no English. I remember the first day when my supervisor talked to me, he talked about copper sulphate, 'liusuantong' [Chinese pronunciation], it's really a common chemical in China. Even you just have very simple chemistry education, you will know this. But for me I cannot understand. I don't know the language. My supervisor talked about copper sulphate. I don't know what he was talking about. But he write down on the blackboard, I know it's 'liusuantong.' So in chemistry there are many, many new words. Every chemical is a new word for me. (Ling, Nov. 8, 97)

Ling came to the PhD program in Wood Science in August 1996 (see Tables 3.1-3). In her late 20's, she had a B.S. and an M.S. degree in Wood Science and Technology from a university in central China. Her TOEFL score was 597 but she did not perform very well on the GRE due to her difficulty on the Verbal part. Ling had actually been lucky; she had two hours of English every day during her first year in the Chinese graduate program because "the university wanted us to concentrate on English training" (Ling, Nov. 8, 97). Her English courses included writing and reading taught by Chinese teachers and speaking taught by an American. But for writing practice, "I always first write down a Chinese paragraph, then translate into English" (Ling, Nov. 8, 97). Even though her spoken English teacher was an American, Ling had few chances to speak with him because he was also teaching young teachers. All of his students wanted to talk to him. Thus it is not surprising that she complained about her difficulty in English, especially in vocabulary. Even at the third interview on January 10, 1998, Ling still found herself baffled by her shortage of vocabulary.

> Sometimes I want to – I don't know how to express my ideas clearly. But I have some Chinese words in my mind, but I got to translate into English. But translate doesn't exactly express my idea. So I'm not happy when I translate English. But I can't find the words within my range of vocabulary. (Ling, Jan. 10, 98)

Ling's language difficulty was exacerbated by her choice to take up a somewhat different area of study, which she had to pursue in an entirely different educational system. Thus she found triple (or more) pressure arising from challenges in language, content, and culture.

> I feel the study pressure is too much, compared with the Chinese education system....Maybe also I find the language problem. For me, my research background is totally different from now I do wood preservation. Mostly it's pure chemistry actually. But for me I don't have so strong a chemistry background. So for me it's really difficult, very tough.
> (Ling, Nov. 8, 97)

Ling revealed a similar feeling two months later.

> The language problem, still a problem. So you have to use this second language to do all of your work. Also the education system is different here. So you have to adapt to the new system. I don't know. I feel pressure, I think every kinds of pressure here, especially for Chinese students. (Ling, Jan. 10, 98)

Ling seemed to have little choice but to face the pressures imposed on her, though she disliked the academic acculturation.

Before she left for Canada in 1996, Ling had been a lecturer at a university in South China for three years. During this time she had published one article in China, co-authored with her Master's thesis supervisor. At the time of the first interview on November 8, 1997, she was submitting a paper co-authored with her doctoral supervisor to a journal, having presented the paper herself at an international conference. Despite the triple pressures (from language, culture, and discipline), Ling seemed to be making great progress in her doctoral program. She had finished three courses and was taking a Directed Study and auditing a fifth. She was also working on her dissertation proposal and her comprehensive examination. The Directed Study prepared Ling for the literature review section of the proposal. By the second interview on November 23, 1997, Ling had come up with a second draft of the proposal, and she was going to submit a second proposal, co-authored with her supervisor, to an international conference to be held in Belgium the next year.

Ling indicated that she was able to make such progress because she received strong support and guidance from her supervisor.

> L: I have finished the paper [dissertation proposal]. My supervisor also helped me correct it. I have to work on the computer first to correct this part [marked by the supervisor].
> J: So your supervisor already gave you the feedback.
> L: Yeah, already. My supervisor is quite good, helped us to improve the writing. This is the second draft [showing the draft]. The first draft he corrected much more. He is quite strict. Here it should be capital [upper case]. You really have to be very careful. But it's helpful.
> L: My supervisor suggested for the Directed Study, he wanted me to put the literature review (for the comprehensive) together with the Directed Study paper because the Directed Study will be scored by another professor.
> (Interview with Ling, Nov. 8, 97)

Thus with her supervisor's support, Ling might well be able to complete her studies on time despite the challenges she faced initially. "Yeah, getting better," she sighed.

4.4 Feng

> They [two papers] published in *Plant Cell Reports*. This was done in China. We have four authors. And one author, he is my former classmate. He write the article and submit but returned back. The editing manager told us that the contents is very good but English...he tried to correct the English but found it is very difficult to correct. So he suggest us you can contact some scientist....So at that stage I was in France. So my friend sent that copy to me because he cannot find a scientist who speak English. So I go to another scientist, but he is a native speaker form England. He work in France but he's an English guy. So he corrected something for us. Then we submitted [and got the paper accepted]. (Feng, Nov. 5, 97)

Feng was 32 at the time of the first interview in 1997 (see Tables 3.1-3). He received a B.S. degree in Biology and an M.S. degree in Cell Biology, both from a university in Tianjin, China, and then worked at the Chinese Academy of Sciences as an assistant researcher for three years. Feng was considered lucky among his colleagues in that he had an opportunity to visit an institute in France during 1995-97. There he did research as a scientist on the interaction between rice and bacteria. Though most people at the institute spoke French, Feng could meet almost all his communication needs, oral and written, in English. This special experience distinguished Feng among all my student participants. Like Ming (see section 4.1), he had published 13 co-authored articles in China, about half of which were related to his Master's thesis; later he was able to publish seven co-authored articles in international journals, all in English. He wrote these articles while in France but some were based on his research in China. Since his research was group projects, his publications were always co-authored, but he was often the first author. Feng's case seemed to reveal that for scientists in China the major barrier to publishing in international journals was the English language, rather than the quality of research. Indeed, most researchers in China were incompetent English writers and help was hard to find. This should come as no surprise as science students seldom paid attention to writing English.

> F: I think in China you don't care about your academic writing because I think the mark depends on the midterm and final normally.
> J: What about your Master's program?
> F: Similar. You have a mid term and final.
> J: You did not write many papers?
> F: No. The homework did not count toward the mark. Right? So just midterm and final. So you don't care about that, but here you should care about this.
> J: As long as you perform well on exams, then you are a successful student.
> F: Yeah.
> J: But here you have to do well on assignments.
> F: Because they have some percentage.
> (Interview with Feng, Dec. 23, 97)

But when he was in France, Feng was able to get help from native-English speakers with his writing.

Feng joined the PhD program in Wood Science at UBC in January 1997 with a TOEFL score of 603. He was attracted to the biotechnology group at Wood Science for its practical research:

> ...because here we have a biotechnology group. They have that kind of group here. So I worked in biotech before. Even here is wood science, but our topic is plant and bacteria interaction, the same as I did in France before. So I came here. (Feng, Nov. 5, 97)

At the time of our first interview, Feng was taking two courses; earlier, he had finished one course offered by the Department of Plant Sciences. By the time of our fourth interview in February 1998, Feng had almost completed the first draft of his dissertation proposal. So he appeared to be making good progress with his studies.

Feng had some difficulty writing general English since he sometimes could not express his feelings accurately. But thanks to his practice writing research papers in France, he did not think he had serious problems writing technical English. Still, he found the discussion part of the research paper challenging, compared with "materials, methods, and results" since he had nothing to follow in discussions. He saw two reasons. First he was doing original research, which meant his data were new. Discussing new data and using them to support his arguments seemed to pose some difficulty to him. Second, Feng was very well aware of the consequences of following examples of published articles, for which he could risk being accused of plagiarism (see Chapters 2 and 5-7 for detailed discussions of plagiarism).

When I contacted him again in June 1998 for a writing sample in addition to the three-page report he had given me earlier, he sent me another article he had just published in a British journal. Feng was the first of four co-authors, which means he probably had assumed the most responsibility for the research and writing. Possibly because he had few writing requirements for his studies by the time of our fourth interview and he did not find much difficulty with technical writing, Feng did not think writing was very important for him to complete his studies. However, he thought writing was of great importance for his future career as communications skills, oral and written, were placed high in the list of job qualifications. Once he had completed his PhD studies, Feng intended to work in a pharmaceutical company where he could use his biotech expertise to produce drugs.

4.5 Hang

> If I want to improve my writing I generally select some papers again, one or two or three. Maybe sometime I translate into Chinese this paper. Then I put it aside for one month, then I translate Chinese [back] to English. (Hang, Nov. 25, 97)

Hang was 33 at the time of our first interview in 1997 (see Tables 3.2-4). He held a B.S. degree in Forestry and a Master of Agronomy degree in Forest Genetics from China. From 1988 to 1995 he worked as an assistant professor at a Chinese research institute of subtropical forestry. While in China, Hang had published eight articles in Chinese, all co-written with two to four authors as he had worked with a research group during his graduate studies. But Hang was the first author. These articles reported on efforts to improve the growth of trees genetically. While a graduate student, Hang and two peers had translated a book from English into Chinese. The book was published under the name of his supervisor, who merely made mention of the three students in the preface.

Hang entered the Master's program at the Department of Forest Sciences at UBC in January 1996. His TOEFL score was 601 with 3.5 (out of 6) on the Test of Written English (TWE) and his GRE score was 1680 (out of 2400). When I interviewed him in November 1997, Hang was considering transferring to the PhD program in his department. By the end of December 1997, he had completed a total of nine courses including one running for two terms. Several of these courses required language-based (i.e., language accounting for more than 50% of the work) term papers and lab reports, which proved a great challenge to him. When he was in China, Hang thought everything in Canada was beautiful and easy-going. But when he arrived, he found everything challenging, especially language. For example, on one course paper he commented:

> I spent too much time on this paper. Yeah, I started this paper from the beginning because at the beginning he told us we should write paper and this course's grade mainly based on this paper. The first time I submitted, he returned. He told me my language was...my written English...I submitted the second time, he told me write again because, I don't know why. Besides language, he told me I didn't grasp the main point of the seminar. Three drafts. (Hang, Nov. 14, 97)

In order to practice and improve his writing, Hang adopted a unique method. He would find an academic article or book in his field, translate it into Chinese, a few pages at a time, then translate the Chinese back to English and compare it with the original. He felt that through such repeated assiduous practice, he would eventually develop his proficiency in written English.

> J: Do you think it will take you a long time to translate?
> H: A long time, but I think it's very useful. Just to read is not very useful. Just reading, I cannot find some problems. But when I write it the problem came.
> J: So you would compare your translation with the original article?
> H: Yeah, sure. When I translate to Chinese I put it aside for a week or two, then I translate the Chinese back to English.
> J: Was your English very different from the original?
> H: Very different, but for academic article, if you do several times, you get used to the style.
> (Interview with Hang, Nov. 25, 97)

At the time of our second interview, Hang was planning such bilingual translation with a monograph of 500 pages. He believed that practice makes perfect and that after finishing that book, he would be able to write well in his area. His translation practice was actually a continuation of the way he learned and used English in China. Since he devoted so much time to improving his writing, Hang neglected the practice of speaking. Therefore, during my five interviews with him, he spoke English and Chinese alternately. Even though he had transferred to the PhD program by the time of our last interview in February 1998, he was trying to postpone his dissertation research proposal defence as he was afraid he might not be able to describe his intended research adequately. If he failed in the defence, he would have to graduate with a Master's degree.

Besides language, Hang found cultural integration intimidating. Several times he tried to socialize with his NNES peers but felt disappointed. In fact, the attempt at integration proved so frustrating that he wanted to give up. Hang also found the student-teacher relationships hard to accept. As a graduate student in China, he worked with a small research group headed by his supervisor. The relationships with his supervisor and other group members were very close. But in his department at UBC, that relationship was nowhere to be found.

> ...the relationship between supervisor and student is nothing like that in China, like father and son or like very close. The supervisor-student relationship here is very cold, just as teacher-student. (Hang, Dec. 15, 97)

Hang envied Chinese graduate students in other departments such as Wood Science, who seemed to receive much better care and faculty support. This seemed to be the case with Ling (see section 4.3). To Hang, the coldness from his professors and the rejections of his drafts and requests for rewrites were not just matters of strictness on the part of the faculty; to him they revealed racial discrimination in his department, which he thought was more real than apparent.

Like most Chinese students, Hang had landed in Canada as a permanent resident. He wanted to find a job doing research at an institute, government agency, or industrial company. If he was offered such a job, he would take it immediately even before he completed his PhD degree.

4.6 Ning

> For me learning is whole life process. Now what I do is just learning process, especially here I need more learning, but this learning is frustrated [frustrating]. I thought I have done this a lot. I thought I can do well. But I didn't do that well. I need to improve and I

want to improve. (Ning, Jan. 2, 98)

Ning was one of the two participants in my study who had already earned a PhD in China before coming to Canada. Born in 1957, Ning was also the oldest among my student participants. While in China, he also received a Bachelor of Medicine degree and a Master of Medicine in Pharmacology. In his doctoral research at a university in Beijing, he investigated toxicology, in particular, the effect of lead on the human eryphrocyte and how to prevent lead from damaging human blood cells. Through the study he made five discoveries about how lead can affect blood cells. However, Ning claimed it was during his Master's studies and three years as an assistant professor at the same academic institute immediately afterwards that he started to "get into science" and gain experience. Based on his doctoral research, he published three Chinese articles with English abstracts in Chinese journals. So it could be said that Ning was a leading scientist in his field in China and possibly internationally.

Ning came to Canada in 1993, and then worked for three years doing odd jobs, washing dishes, and cooking in restaurants to make a living. He was accepted to the PhD program in Food Science at UBC in September 1996 with a TOEFL score of 593. Since he had not been granted any financial assistance when I first contacted him in September 1997, he had to continue cooking for a restaurant on weekends. Many Chinese students studied in certain programs because they could get financial support there. But clearly this was not the case with Ning. His background was in medicine and pharmacology, but now he was in food science, a different, albeit related, field. In response to my curiosity about why he chose to undertake the PhD program, Ning replied:

> N: You have to get education in order to find a job. You don't have Canadian education. No one can recognize your experience in China.
> J: Why do you have to do a PhD? You can do a Master's to get experience.
> N: If a good graduate program, something very exciting, very challenging, I'd like to take Master's. For Food Science I don't think Master's program is suitable for me. I know PhD needs more time and more hard working. I don't like this, but I have to take this.
> J: You mean Master's wouldn't prepare you adequately for the market?

> N: I think doing Master's degree wastes my time. For Master's degree you just do what you are told to do. You are machine, a technician. You don't have to have your own thought. I have my own thought, my own idea. Why do I have to follow others? It's a painful process. Better I choose this one.
> J: So you want to do something creative.
> N: I always do something creative. Same thing. Why I want to take the PhD program in China? Why? I want to be independent; otherwise you have to be...But I don't know. I don't know whether I can get good result after I finish the program. I don't know.
> (Interview with Ning, Jan. 2, 98)

Similar to Ming who also had an established history of research, Ning had to start all over again. By September 1997, he had completed seven courses in his department. Because he lacked a background in food science, five of them were at the undergraduate level. For these courses, he had written one lab report, two term papers (literature reviews), and one research proposal. He received 60 out of 100 on one term paper because of his language problems. When I met him for our second interview in November 1997 (see 3.2.3), he had just passed the comprehensive exam, which was a stay-or-quit exam and very tough for him. Based on a broad half-page question, the exam consisted of a written part, to be completed within one month, and an oral part, something like a dissertation defence. Ning recollected the tough experience:

> Actually, it's called defence. After you've done this, you are supposed to know everything about what you write. Even you haven't done anything; you are supposed to familiar with method, methods and also results, so everything they can ask you. What kind of instrument you are using. So last 3 and a half-hour. You stand there. Keep asking. They have 6 professor. OK. They have two rounds. One round everyone have 15 minutes. So whole session, 30 minutes to ask you questions. 6 members. So they have 3 hours to question. That's a lots of questions. They keep asking. Not stop. This finished. Another one next. (Ning, Nov. 13, 97)

Ning had to pass the comprehensive exam in order to start research and get hired as a graduate research assistant and paid. If he failed in the exam, he had to quit; therefore, he had to prove as early as possible that he was able to stay in the program. While in China he had enjoyed academic program security by being able to enter programs through competitive exams; at UBC Ning felt an absence of such security.

> N: ...Here different from China, here is: you die is you die.
> J: Sink or swim.
> N: Sink or swim. They don't care. If you can pass, you pass. If you fail, you go, quit. Kick you out of school.
> J: Very brutal.
> (Interview with Ning, Jan. 2, 98)

By the time of our second interview in November 1997, Ning had started to find a research topic for his dissertation proposal. His supervisor had also promised to hire and pay him soon.

Ning admitted having problems with various aspects of English including grammar, idiomatic expressions, style, sentence connections, and vocabulary. But he was willing to learn and often made deliberate efforts to learn. For example, he was the only student participant who asked me to correct mistakes in his regular e-mail.

> N: Whenever I write e-mail to you please correct my mistakes.
> J: You don't mind being corrected?
> N: I prefer so.
> J: If you like it, I'll do it for you.
> N: Writing e-mail is a learning opportunity.
> (Interview with Ning, Dec. 5, 97)

4.7 Ding

> Sometimes I just feel I cannot express it clearly. Sometimes don't know which is the most suitable for this meaning. How to express it? Especially during scientific writing sometimes it makes somebody confused. They don't know what you are talking about. (Ding, Nov. 17, 97)

Ding, aged 26 in 1997, was the youngest among my student participants (see Tables 3.1-3). He first came to the Master's program in Animal Science at UBC in January 1994. While in China, he received a B.S. degree, at the age of 20, in Public Health for the control of infectious diseases among animals and humans. Then, he worked for three years as a government officer at an inspection center for fish and meat. During the last year, he also managed a food-processing company in central China. However, he was misinformed about what it might mean to "study at a Canadian university."

> When I first came here, even now I feel it's very funny. When I came here I was just 22. I just think the impression of foreign countries because by that time I just watched *Pekingese in New York* [one of the first TV movies about contemporary Mainland Chinese abroad]. Even if I got the student authorization, I just think I came here to actually work here. So I even didn't bring any textbook. (Ding, Dec. 15, 97)

Though Ding scored 603 on the TOEFL, he complained about his bad pronunciation as his teachers never taught him how to speak English. To prepare for tests such as TOEFL, he simply bought a book and studied by himself. Naturally, he was to meet with language difficulties in his studies at UBC.

When I interviewed him, Ding had completed his Master's degree and was now registered in the PhD program in Animal Science. By that time he had taken a total of seven courses including two running for two terms, offered by his own department and the Faculty of Medicine. For these courses, Ding had written 16 lab reports and two term papers and given eight presentations. In addition, he had written a Master's thesis. The oral presentations in particular were hard for him in the beginning. "I remember clearly each day when I was waiting for bus, I had to try to remember what I'm going to say" (Ding, Nov. 17, 97). Fortunately, one graduate seminar came to his help. The course instructor videotaped the three presentations he gave and went over the recordings with him in detail offering constructive comments and suggestions. Thus Ding could perform with more ease in his later class presentations. Ding worked very hard. Besides his course work, he gave six conference presentations and was the first author of seven articles co-written with his supervisor and published in international journals of science. One of these presentations even won a second prize.

According to Ding, Chinese students are very strong in background knowledge. But they have difficulty expressing their ideas in English and therefore do not appear as strong in the English-medium classroom.

> The background, the knowledge...I believe Chinese students is stronger than foreign [non-Chinese] students, but just we cannot express it. But I think we are stronger than them. (Ding, Dec. 15, 97)

Therefore, whenever he wanted a discussion, he would seek out another Chinese student.

Ding had strong career ambitions. He knew exactly what he was doing, what he wanted to do after he finished his PhD, and what it would take him to reach his goal. For a start, he had studied for and received a trading certificate at a community college and set up his own company.

> Just biotech co.. Because I finished both experiments, so I can directly identify opoptosis, opopotic cells. This is actually a common mechanism for the cancer cells. So I also make some kits to sell to China. But I just started. I just got my second order from China. (Ding, Dec. 15, 97)

Ding was very pragmatic. He knew it might be difficult to find a job if he continued to pursue theoretical research, so he changed his dissertation topic and persuaded his supervisor to agree to replace two of his committee members. One of the new members was from the clinic. When I met him for our second interview he had just finished redrafting his proposal, of which I made a copy with his permission. But his initiative surfaced only after he grew more confident and fairly established in his research.

> Before, sometimes I know this thing my supervisor did wrong or something. I feel not comfortable to say it. But I don't dare to say this. But now I don't care this because I have to be realistic. After I graduate I can't find a job, I'll be in big trouble. So I have to think about myself, think about my future. (Ding, Dec. 15, 97)

Ding was very conscious of the non-academic requirements of being a graduate student at UBC. In China, university students, graduate or undergraduate, received living subsidies from the government and/or family members, and job assignments upon graduation. So they did not have much to worry about except their studies. But being a graduate student at UBC meant studying, working, and living independently, and taking control of one's future.

> Because student is not same as when you were student in China. Anyway, you have so many pressure here because you come to this land, you have to face basic living, survival, how to struggle for this. So you cannot be like other students - don't need to worry about many things. You need to worry about work, future, everything. You cannot totally concentrate on your study. But in China you don't need to worry about anything. (Ding, Dec. 29, 97)

Though native-English-speaking (NES) students at UBC, especially at the graduate level, also have to take care of themselves, Ding certainly seemed to be one of those Chinese students who had adapted to this aspect of Western student life.

4.8 Ping

> The problems is, the general impression you give is you are not a native speaker. I know it consist of many specific errors. But I'm not clear, myself is not clear about that. (Ping, Nov. 8, 97)

Ping, aged 28, enrolled in the Master of Applied Science program in Electrical Engineering at UBC in January 1997 (see Tables 3.1-3). His test scores were exceptionally outstanding. He received 653 on the TOEFL with perfect marks on Grammatical and Written Expressions and Reading Comprehension, and 5 on the TWE. His GRE score was 2210 with 640 on the Verbal part. While in China, he had received a Bachelor of Engineering (B.E.) degree in Automatic Control, a minor B.E. degree in Environmental Engineering, and a Master of Engineering (M.E.) degree in Automatic Control Theory and Application from one of the leading engineering universities in Beijing. He was the lead author on three articles published in Chinese journals, and co-translated two articles published in the U.S.. Ping also had given five conference presentations in China. Before he arrived at UBC, he was an assistant professor at the institution where he had been a student.

When I interviewed him in November 1997, Ping was taking three engineering courses, having completed another three during his first term at UBC. For his course work he had written two lab reports, one term paper, and one project report besides other assignments. Because Ping received very little feedback on his language, he was still using some of the conventions common in Chinese writings but not in English, as revealed in a course paper he showed me in late November 1997 for proofreading. Though he tried very hard to "live in Rome as Romans do" and imitate reliable published writing samples by native-English speakers, he still had various language and mechanical problems in his writing such as the use of articles, prepositions, idiomatic expressions, and punctuation. Sadly, he was not aware exactly what his problems were: "I know it consist of many specific errors. But I'm not clear" (Ping, Nov. 8, 97). And yet, he did not expect feedback from his instructors on the formal aspects of his writing:

> P: Also I don't think it's their responsibility.
> J: No?
> P: No.
> J: To give you feedback?
> P: I mean the feedback on my language. It's not their responsibility.
> J: Why?
> P: You see, for example, maybe not true for your department. I came to this department of Electrical Engineering. They should teach you as much as possible about electrical engineering, this field. But language, I'm not in English or education. I don't think it's their responsibility.
> J: Then whose responsibility is it to help you with academic writing?
> P: I think first, it's myself. Second, if possible, the university, if they can afford the finance, like -
> J: - the ESL classes.
> ...
> P: It's [offering ESL classes] important, and useful, but they are not obliged to do so.
> (Interview with Ping, Feb. 9, 98)

Ping thought the reason that instructors seldom offered him feedback was that they were so focused on the content that they did not care about the language or other formal aspects of the writing. Thus without feedback from instructors or others and without self-awareness, I believe Ping's formal problems would have continued, had I not explained what I found problematic during my proofreading. Still, Ping hoped that "if they have time, if they can, rewrite or point out my mistakes, my inappropriate usage and return my assignments, my paper, my thesis to me" (Feb. 9, 98). Ping was very appreciative of corrective feedback.

Ping used Chinese for daily communication about 80% of the time. At home he spoke Chinese all the time and at school, half of the time Chinese and half of the time English. Even though the larger environment for him was English, the immediate environment was still Chinese since he had Chinese classmates, friends, and roommates and they found it more convenient to talk in Chinese. When he spoke English, even though it might not be correct, his Chinese interlocutors could totally understand him. This environment with many other Chinese students had a negative effect on Ping's learning of English. The best way to learn English, he observed, was to totally avoid Chinese, if possible, in order to practice speaking English. Fortunately for him, at our last interview, Ping revealed that he would be getting some practical experience.

> You see, at last time I stayed there [Prince George] for one week, I didn't meet one single Chinese person. Of course I know there are several Chinese person. Actually I have made contact through e-mail [with some Chinese person]. But around me no Chinese. I think it's good. (Ping, Jan. 24, 98)

However, since his contact with native English speakers at UBC was rather limited and the feedback he received from his instructors was very minimal, Ping did not feel a tremendous culture shock, unlike some other student participants (such as Ling).

> J: Any cultural conflicts? Are they serious?
> P: Not very serious. You see, at university, very often we just talk about the academic problems. For the culture we only talk with each other, asking for curious. 'Oh, something different from ours.' We didn't discussing some deep things.
> J: Like values. I think a big difference lies in social values between Chinese culture and western culture.
> P: Yes. I think the reason there's no big conflict is that we didn't touch it.

(Interview with Ping, Jan. 24, 98)

As suggested by his exceptional test scores, Ping was an excellent student. He had received A's and A+'s for the six courses he had taken at UBC. He intended to finish his Master's degree program by October 1998, and then decide whether to find a job as electrical engineer or to continue his studies in a PhD program.

4.9 Qing

> Actually I have done a lot for the programming. Spent lot of time. But when I came to writing, I didn't want to write anything. Finally, I just got 20 pages, less than other students. For that course I didn't get a good mark just because of language problems. Actually I have done a lot. When I came to writing, I didn't know how to say it. When I write in Chinese I think it's OK. But I didn't know how to say it in English. It's very bad. (Qing, Nov. 1, 97)

Qing, aged 29 in 1997, enrolled in the Master of Applied Science program in Electrical Engineering at UBC in September 1996 (see Tables 3.1-3). She had the same co-supervisors as Ping. Before she arrived at UBC, Qing had earned a B.S. in Automation and an M.S. in Electrical Engineering in China. She passed College English Band Four as an undergraduate and Band Six as a graduate student; these are tests administered in Chinese universities as English proficiency tests for non-English majors. Qing seemed to have learned the English textbooks very well in high school but did not work very hard at English after entering university, as she explained,

> My grammar was very good in secondary schools. I scored almost 100% in the national entrance exams. But after I entered my university, which was not a good key one, my English failed to improve. According to my usual and entrance exam scores, I could have entered Tsinghua University or USTC [University of Sciences and Technology of China]. But I didn't put them as my first choice....But after I entered university I didn't study very hard. At that university, not many students went abroad. So I didn't pay much attention to English. I just tried to maintain the same (top) class standing, even in my graduate studies. After that I worked for some years. Only in 1995 did I realize I should study English and took the course *The New Orient* for one month before I took TOEFL. My grammar

> should be good. My vocabulary should be no big problem. But I didn't study a writing course. No systematic training. I don't know the theoretical part of writing. Also, I didn't writing a lot of things. Only in reading when I was a graduate student, my foreign teacher asked us to write a little bit description, exposition, etc.
> (Qing, Nov. 1, 97)

Like many university students in China, Qing learned English with an emphasis on grammar and reading. Not surprisingly, she scored 610 on the TOEFL and only 4.5 on the TWE. She even scored 1910 on the GRE with 500 on the Verbal part. But since she received almost no training in English writing and had almost no experience writing essays and the like, she found herself unable to express her ideas in a paper. So, she was dismayed at the course report she wrote during her first term at UBC, as she described in the first quote above.

While in China, Qing had published one co-authored article in a Chinese journal, based on her Bachelor's thesis. Between 1992 and 1996, she worked on commercial research projects as an electrical engineer at an institute of the Chinese Academy of Sciences in Beijing.

When I first interviewed Qing in November 1997, she had finished six courses and was taking another one and auditing an eighth. She had written four reports for courses, but still had difficulties presenting her ideas and research. One reason for her difficulties was that she normally coded her ideas in Chinese. When she wrote in English, she had to translate. Hence, she had to use many expressions from the literature to express herself in English. Despite her writing difficulty, Qing had generally received good grades on her papers. She appeared to work very hard on her experiments, computer simulations, and on constructing figures. Luckily for her, language was not a priority in her program.

> We pay attention to the result. We spent too much time on the figures. Finally we just compiled everything together and gave the report. So in this way if we can get the correct result and the result is good, it's [more] important than the writing. (Qing, Dec. 30, 97)

To devote as much time as possible to her research, Qing worked in her lab almost every day, including evenings, weekends, and holidays.

> Maybe the Chinese students are used to working every day. So now even today it's a holiday, I don't think I should stay at home. I just come here. I have a lot of things to do. (Qing, Dec. 30, 97)

It was primarily due to her hard work that Qing could do well in her program. She intended to finish her Master's program in 1998 and then, if possible, work as an electrical engineer. She would consider doctoral studies only if her job hunting attempts failed.

4.10 Wang

> Normally you have got the ideas. Normally it's a new idea, a new discovery from your experiment. There is no one. You cannot find them in any other papers. Then how to describe it properly. That's hard. (Wang, Dec. 4, 97)

Wang, 33 in 1997, entered UBC in September 1996 (see Tables 3.1-3). He was attracted by the comparatively low tuition UBC charged international students at that time. While in China, he attended a leading engineering university where he earned a Bachelor's degree and a Master's degree, both in Electronics. In 1988-90, between these two degree programs, he worked as an assistant engineer for a space science center. Between 1993 and 1996 he went to Singapore, where he designed computer hardware. Though the formal working language at that company was English, he spoke Mandarin with his workmates privately. So, unlike Feng's experience in France, Wang's three years in Singapore did not have much positive effect on his English or his technical knowledge. But he did gain some practical experience.

Wang's highest TOEFL score was 630 with 5 on the TWE. That was from the test he wrote in Beijing in 1991. When he wrote another in Singapore later, whose score was accepted by

UBC, it turned out to be lower.[3] He also took the GRE in 1991 but only received a total of 1800. Wang's program at UBC was the Master of Applied Science in Electrical Engineering. When I interviewed him in November 1997, he was taking one course, for which he was to write a technical report on his design of a computer chip and some simulation. Meanwhile, he had just started his Master's thesis research in wireless network communication sponsored by a local company and had to write a quarterly report on his thesis for the company. In addition, as his research formed part of a four-person project led by his supervisor, he was supposed to meet with the group once a week. Prior to September 1997, Wang had completed six courses, all in classes with 20 or more students, and had written five course papers.

Wang had several concerns about his English. Typically when he read an English article, he would have to process the information in Chinese; otherwise, he would feel unsure whether he indeed understood what he read. In order to comprehend and remember the information from his reading, Wang had to add the information to his Chinese framework of knowledge as if he would not trust his English. He described his use of Chinese for information processing this way:

> J: While you read, it's in English. After you read, you process it in Chinese.
> W: I think so.
> J: Because you want to relate to something you learned before.
> W: Most probably in Chinese.
> ...
> W: I think only when you say in your mind in Chinese, OK I understand, then you are really understand about this paragraph. And if in your mind, your Chinese is totally a mess, then you really don't get the point. You just use this kind of things to think. I think it's still in Chinese style.
> (Interview with Wang, Dec. 4, 97)

Wang was also concerned about the simple style of his writing. He felt that his simple vocabulary and sentence structure did not match the complex research he was trying to present.

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[3] As per the Educational Testing Services (ETS) policy, TOEFL scores are valid only for two years.

Moreover, he lacked confidence in expressing ideas for which he could not find expressions in the literature. Presenting original research was the most difficult:

> W: How to do the discussion, how to do the comparison between your result and those of others.
> J: So to discuss the work in the framework of the research.
> W: How to find the meaning of your work, summarize your work actually.
> J: Do you find it hard, the expression is hard or just to discuss it is hard?
> W: The expression is hard.
> J: Harder than ideas, the organization.
> W: Normally you have got the ideas. Normally it's a new idea, a new discovery from your experiment. There is no one. You cannot find them in any other papers. Then how to describe it properly. That's hard.
> (Interview with Wang, Dec. 4, 97)

By the time of our last interview in February 1998, Wang had not published anything. Perhaps because of his language difficulty, he did not plan to continue studies in a doctoral program. Instead, he intended to seek a job at a communications company.

4.11 Xing

> The major problem is you have a lot of thing to write but you should organize them properly. I think this is a problem. (Xing, Feb. 15, 98)

Xing came to UBC in January 1997 (see Tables 3.1-3), aged 33. He held a B.S. in Electrical Engineering and an M.S. in Control Theory and Applications, both from a university in central China. Before he left China, he had been an engineer at a university for seven years and an assistant engineer at a firm for two years. Xing had published four co-authored articles in Chinese journals. These articles reported his group projects that aimed to build up a supervisory control and data acquisition system to control the power systems of electrical rails. Xing had also given two conference presentations, on power control systems, at international academic conferences held in China.

Xing was enrolled in the PhD program in Electrical Engineering with a TOEFL score of 627 and 4.5 on the TWE. His GRE score was 2000 though his program at UBC did not require applicants to write the GRE (most Chinese students who wrote the GRE in China did so to satisfy the requirements of American universities). Ten U.S. universities had admitted him but offered no financial support since his GRE score, which was excellent, was still considered not competitive enough. So Xing accepted the offer from UBC. He was glad to be a student again with an opportunity to learn new knowledge that he had always desired. Further, he felt that at UBC he could learn actively with a purpose. His only regret was that he did not start studying in Canada at a younger age.

> I think it's quite good experience to be student again. What I feel is I wish I were still a young guy, just around 20 years old. Maybe as teenage I can study in undergraduate studies. In China we learn very passively, not actively. Here we still have some purpose and learn actively. This time I have a very clear idea, I should know what kind of stuff. But when I was a graduate and undergraduate in China, I don't know. I didn't know what I should learn, and at what I should spend more time and energy. But this time I know. (Xing, Dec. 20, 97)

When I first interviewed him in November 1997, Xing was taking one course in computer science for which he was to perform a computer simulation and then write a report on it. He was also working on his thesis proposal, also known as qualifying exam in his program. Earlier, he had completed three courses but had not had to write much for them. Partly for this reason, Xing found writing difficult. In particular, he had difficulty getting his thoughts organized and finding the appropriate words to express his thoughts. It seemed to him that in order to write well, he had to keep on writing. Once he discontinued his practice for some time, his writing skill would deteriorate.

> X: In my writing I think another problem is I just want to find a word to express my meaning more accurately. Sometimes it is difficult to find such a word just because I don't writing things frequently.
> J: I see. Do you use a thesaurus?

> X: Thesaurus? What's the meaning?
> J: A dictionary of similar words.
> X: Actually previously when I was an engineer at South China University [a pseudonym], I wrote a lot of things. I wrote documents for my institute, all in English. I also translated a lot of technical documents for other people and companies. So at that time I wrote quite a lot. But after that, I stopped writing for several years. So I find writing is not too easy.
> (Interview with Xing, Nov. 3, 97)

One problem that Xing had in his writing at UBC, at least initially, was that he tended to focus on the plots (simulation procedures) and pay less attention to comments. His few comments turned out to be too general to be meaningful. He also pursued "good results," at the expense of thinking carefully how he would achieve the result. Xing attributed these practices to the Chinese way of thinking:

> Here we must be very specific. In China we just did it very generally, and give some general comments. Here the comments must be related to some concrete examples. When I came here, the first assignment I did a terrible mistake. I plot a lot of plots in my simulation. The prof said 'I would like to see more comments than plots...' Another I think is different. In China, maybe for this way of Chinese thinking, they pay more attention to the result, not the method. If you can get a very good result, you can get a good score or mark in China. But here, the profs pay more attention to the method you use. Maybe you don't get a good result just because the time is short, or your method is not well done, but it's unique. So at that time, it's impossible for you to get a satisfying result in a short time. But the prof say 'Oh, this method is original.' Even though you don't get a good result, you can still get a good score.
> (Xing, Dec. 20, 97)

Obviously, Xing had received some feedback or advice from his instructors or supervisor. But like many other Chinese students, he expected more feedback, not only on the content of his writing but also on his language. He wanted to know where he was strong and where he was weak or wrong so that he could work hard to improve the negative areas.

> X: Oh, sure. I wish they look at it carefully and give me some correction on my English, some suggestions, comments about the method I use. I wish they can feedback this info to me.
> J: Exactly, I think many students would appreciate that kind of feedback because that's where you can know -
> X: - feedback a lot of info. This method, whether it is good or not. I write it. It's good just

> because it's my opinion. What's his opinion? If he can give me feedback, I can get more info.
> J: Right. and you can feel more confident. If it's not perfect, you can try to improve it.
> X: I can improve the way of my thinking.
> (Interview with Xing, Dec. 20, 97)

Xing wanted to be perfect. I presume this desire for perfection is a carry-over from what he (and most other Chinese university students) had developed in the extremely competitive Chinese context, where only those students who performed perfectly or nearly so on exams could enter the university. He wanted the feedback from the professor because, for him, the professor was someone who must be responsible and omniscient, and have the right answer to his questions.

4.12 Kang

> I just transferred to Master from PhD. I was accepted as a PhD candidate. But the job market these years is pretty good. So when I finish, if I go ahead for my PhD, when I finish, it will be 4 or 5 years in our department. So after that, how can I know if the job market is good any more? (Kang, Nov. 11, 97)

Kang was 27 in 1997 (see Tables 3.1-3). He had an English name but preferred to be called by his Chinese name. Kang held a Bachelor of Engineering degree in Engineering Physics and Nuclear Physics and an M.S. in Electronics from two of the best universities in China. Based on his Master's thesis research, he wrote one article and gave two conference presentations in China. The article was later published in a Chinese journal. Before he came to UBC in September 1996, Kang worked as a software engineer for seven months in China and among all my student participants, had the least working experience.

Kang indicated that he came to UBC by accident, implying that he had wished to study elsewhere. He had scored 620 on the TOEFL, 5 on the TWE, and 2050 on the GRE, all excellent scores. But his GRE score was below the average in Beijing, which he quoted as 2100 for the year he wrote the exam. When he first came to UBC, he enrolled in the PhD program in Electrical Engineering but later switched to the Master of Applied Sciences program in the same department to take advantage of the opportunities in the current job market. Pursuing the PhD degree would take four to five years - too long for him. Besides, he thought that in his field a Master's degree was more than enough to find a job. Kang was very job-conscious. When we met in November 1997, he had just "got landed." But he was ambivalent as to whether to stay in Canada as a permanent resident or move on to the U.S., where the job market was even better.

At the time of our first interview, Kang was taking one course, for which he was to write a full-length research report that included a proposal and later, a final report of 40-50 pages. Further, as stated in the course outline, "the more you exceed the page limit, the better it has to be." Earlier, Kang had completed six courses for which he had written four laboratory reports, one term paper, and two project reports (similar to term papers in structure and length). He had also submitted two proposals for conference presentations in the States.

Kang found it difficult sometimes to organize sentences because he believed that technical writing, unlike general writing, should have long formal sentences with complex structures. Though complex sentences could be confusing, they were considered signs of high quality in technical writing. If he wanted to write good English in his assignments, he should emulate those typical sentence structures.

> Sometimes it's difficult to organize sentence. You know, in technical writing the sentence is pretty long. Sometimes, you have to give many conditions. You have to describe many things, preconditions, and post conditions in whole sentences. Sometimes in one paragraph only one or two sentences. That's hard to organize that in formal English structure. Technical English is quite different from general English, from spoken English....Formal words, long sentence. In general English you don't use very long sentence. That means confusing and misleading. But in the technical writing people often use long sentences – just kind of trick. (Kang, Nov. 11, 97)

Moreover, he believed that to write good English, he had to think in English. "If you want to improve your English, improve your English writing, you have to force you to think in English and write in English. Sometimes I force me to do it" (Nov. 22, 97). While he might not have to always write long complex sentences, he was on the right path to writing English by trying to think in it.

Kang relished the academic freedom allowed at UBC. A student could choose virtually any topic for research, and could even change the program supervisor if necessary. In China a student could only dream of such freedom, for graduate students are selected and admitted by individual professors, rather than the department, and normally have to study under the supervision of the same professors throughout the program. Moreover, Kang was amazed at the information technology he had access to at UBC; he could retrieve huge amounts of information in minutes.

> Campus environment is quite different from there in China. You can propose to do anything you like in the academic. You can choose topic you like. If you don't like, you can change the supervisor if you like. No one can force you to do something you don't like it. But in China sometimes you have to do it (no choice). Yeah, there's the highly developed technology here. It's very benefit to students to do research or study in the...you can retrieve some paper very quickly. (Kang, Nov. 11, 97)

As an immediate beneficiary of information technology, Kang thought that the Internet really changed our lives, including how we communicate and conduct research. His amazement was one force that motivated him to choose electrical engineering as his future career.

4.13 Bing

> When I think, I have a lot ideas in my mind. When I try to put them to words, I just can't bring the ideas out, don't know how to express them. (Bing, Nov. 14, 97)

Bing, aged 32 in 1997, arrived in Canada in April 1995 with her husband, a research associate hired by UBC (see Tables 3.1-3). From September 1993 to April 1995, she lived in North Carolina with her husband, who was working there. During this time, Bing stayed at home taking care of her young daughter. But she managed to learn some conversational English from an ESL class at a church. Before she came to North America, Bing had received a B.S. and an M.S. in Environmental Biology from a university in northeast China. Upon graduating with her B.S., she worked for two years as a research assistant for a government environmental protection bureau and then, after earning her M.S., worked as a research associate for a hospital for three years. While she was completing her M.S. studies, Bing co-wrote one article with her graduate supervisor and published it in a Chinese journal.

Bing enrolled in the M.S. program in Bio-Resource Engineering at UBC in September 1996 with a TOEFL score of 593. Upon enrolment, she was hired as a research assistant by her supervisor, a Chinese Canadian who spoke Mandarin. Indeed, most of Bing's conversations with her supervisor were in Mandarin blended with some English. During my five interviews with her, Bing frequently switched to Mandarin, when she found it difficult to express herself in English.

During our first interview in November 1997, Bing was taking a flexible seminar course that would run for two terms and focus on her thesis. The assignments were two presentations, one on her thesis proposal and the other as a mock thesis defence. Before September 1997, Bing had taken six courses and audited another two. When I interviewed her in February 1998, she was taking one more course, offered by the Department of Pathology. For these courses (excluding the seminar course mentioned above), Bing had to write four term papers, three of which were literature reviews, and 11 lab reports. In addition, she had to give three class presentations.

Bing was used to thinking in Chinese. When Chinese ideas came to her mind first, she would take notes in Chinese. This meant that when she communicated in English, she often had to undergo a process of translation, which sometimes created problems.

> For me I want the paper write in real English not Chinese style English. That's really hard. Because the thinking, sometimes I use Chinese to think something. Then after that I translate to English. And also I find it difficult to use appropriate words. Also the sentence, and grammar. (Bing, Dec. 9, 97)

> B: Sometimes I don't [know] what should I say [at the presentation]. You have to organize the sentence for next speaking in your brain and sometimes you have to translate from Chinese to English.
> J: That's even worse. It takes time. People here are waiting for you. 'Come on, come on.' It's hard. The best way is to try to think in English. If you translate, it's like a double process. It takes much longer. I always do a rehearsal for a formal presentation because that way gives you an idea of what to say, what not to way, how much to say about which point....
> B: Yeah. Last year I gave 3 or 4 presentation. Every time I have to write down what I'm going to say. And then I remember [memorize] that thing. So I just remember in the brain, and when I give the paper...and I just read the transparency. The professor said 'you didn't have eye contact.'
> ...
> J: It looks like whenever you come to presentations, you feel...
> B: Feel nervous.
> J: Feel less confident.
> B: Yeah. Just like usually I'm speaking English, I always feel like I make a mistake.
> (Interview with Bing, Nov. 14, 97)

Another reason for Bing's poor delivery style at the presentations was her lack of experience, which was also true of most Mainland Chinese students. As indicated elsewhere in this dissertation, students in Chinese universities had little chance to speak in front of the class. Moreover, Bing was nervous whenever she spoke English, because she had had little practice doing so. Nor did she have to at home, on campus, or around town since she could survive very well just by speaking Chinese.

Furthermore, Bing deliberately spoke Chinese at home. She did not want her daughter, in grade one, to lose her Chinese language, and perhaps later on, to lose the ties with the parents and the Chinese identity. The following interview excerpt elaborates on this point.

> J: But you do speak Chinese at home?
> B: That's right. That's for the benefit of my daughter because we don't want her....We have to force my daughter to speak Chinese at home; otherwise once she was in school, she speaks English all the time from in the morning to 6 o'clock. That means most of the

> time she speaks English. Now she can't speak Chinese very well.
> J: How old is she?
> B: Six, grade one.
> J: She is forgetting her Chinese.
> B: Yeah, almost totally. Now she used like English sequence, *dao zhuang ju* [inverted order sentences].
> J: Really? She would speak Chinese in the English way?
> B: Yeah, like somebody keep *zou*-ing [going], and a little bit *gao*-er [higher].
> J: What a mixture.
> J: So you are worried that your daughter might lose her Chinese.
> B: Yeah, so I have to speak Chinese at home.
> J: If you work with her on story books....
> B: Yeah, we read story every day. Like one story, one Chinese, one English. They have Chinese translation. So she will know.
> J: Right. There are novels like Amy Chan's *Double Happiness*, the other one, *Joy Luck Club*.
> B: The other one, I read the book and see the movie, *Joy Luck Club*.
> J: You can see the difference between generations.
> (Interview with Bing, Dec. 9, 97)

It is worth noting that even after more than four years in English-speaking countries, including a year and a half in a graduate program, Bing had not developed the habit of speaking English, nor did she find it easy to communicate orally in English. I collected three of her written assignments and found that they contained some conventions typical of Chinese writing (e.g., colon after a subheading) as well as various citation and grammar errors. Apparently, she had not received enough feedback on her written work. As she admitted, many instructors in her faculty simply did not bother to return students' assignments. Upon my suggestion, she approached some professors and was able to retrieve a few of her papers.

4.14 Ying

> Style could be difficult. If you write in your native language, you know what language, what vocabulary, is appropriate, what kind of writing style to use, but I don't quite get the proper sense of how certain vocabulary is to be used, how the sentence should be organized. Not just grammar. (Ying, Nov. 24, 97)

Ying came to Canada in 1993 at the age of 26 (see Tables 3.1-3). She held a B.A. in English Literature from a teachers' university in China and had worked as a tour guide there for four years. She had no publications or presentations, but as an English major, wrote her B.A. thesis on teaching methodology in English. For the first two years in Canada, she worked as a coordinator for an import and export company in another province. Then she spent one year at a Canadian west coast university taking basic undergraduate courses in preparation for graduate studies at UBC.

Ying enrolled in the M.S. degree program in Audiology and Speech Pathology at UBC in September 1996 with a TOEFL score of 627, though she had hardly any background in audiology or speech pathology except for her one year undergraduate course preparation. When I asked why she chose to study in a totally different field, she replied,

> Well, it's a good profession. I like the work, and good employment prospect. I want to learn something useful. I don't want to just go there and a degree, do a PhD. You spent a lot of time, spent a lot of resource, but what do you do with the degree after you finish. (Ying, Nov. 10, 97)

Unlike Ting and many other Chinese students who studied in programs related to their education in China but offering few job opportunities (see section 4.2), Ying selected her program purely on the basis of job prospects. In this sense, she was very job-minded, similar to Ding and Kang. When I first met her in November 1997, she had finished one summer practicum and 12 required courses and was taking another five. Most of her courses involved a considerable amount of reading and writing. The written assignments included lab write-ups (up to four pages), short papers, term papers (up to 20 pages), and oral presentations. Despite the large number of courses she was taking in any given term and throughout the program, the scientific nature of the course work, and the tremendous reading and writing loads, Ying handled the courses quite well generally, thanks to her hard work and English language background. She performed poorly only on one small test and one lab report.

Unlike most of the other Chinese student participants in my study such as Hang and Bing, Ying would use English to think when she read English texts or planned and composed writing. She did not have a related framework of subject information from her Chinese education to refer to. Instead, she had studied English as her major for four years in her undergraduate program. Ying actually found it hard at times to translate English to Chinese when she had to explain her work to her Mandarin-speaking friends as she did not know many Chinese equivalent terms.

In her writing, Ying did not encounter many difficulties with grammar, nor did her writing samples show many problems on the sentence level. But she did have her own challenges, which are more typical of HSS students (see Connor & Kramer, 1995; Connor & Mayberry, 1996; Leki, 1995a; Riazi, 1995; Schneider & Fujishima, 1995). These included reading all the required references under time pressure, selecting salient information from the readings to write assignments, organizing her thoughts, and writing in an academic style using appropriate words and sentence structure. To help herself over the challenges, Ying would refer to at least one model when writing a term paper.

> J: You said the term paper is the hardest. Why?
> Y: First, a lot more info needs to be organized.
> J: OK. Maybe also you have to write many, many pages.
> Y: Yeah, just lots of references. Just organizing material, and organizing your thought. That's the major part of your work and get all the references, the selections, also the major part.
> J: And you have to read all the references.
> Y: Yeah. And also the language you want to write properly. That's also challenging as well.
> J: So from organization to writing per se, all of this is hard. Why do you think writing itself is hard? In other words, what aspect of the composing process is hard?
> Y: Style. The style of writing, the flow of thought.
> J: Does it have to do with diction, expressions?
> Y: Expressions, sure.
> ...
> Y: I don't know if it's conflict. You do have difficulties.
> J: Like what?
> Y: Writing style.

> J: The English writing style is more complicated. Do you mean that way?
> Y: Style could be difficult. If you write in your native language, you know what language, what vocabulary, is appropriate, what kind of writing style to use, but I don't quite get the proper sense of how certain vocabulary is to be used, how the sentence should be organized. Not just grammar.
> J: Rhetoric maybe.
> Y: Yeah.
> J: But you try to write in an academic style.
> Y: That's why you have to follow a writing model.
> (Interview with Ying, Nov. 24, 97)

Following models is a strategy that almost all Chinese and other ESL students practice in their initial writing stage (see more discussion on this in sections 5.2 and 7.1). In this respect, Ying was no exception.

Despite her English language competence, Ying felt socially disconnected because she was the only Mainland Chinese student in her department and it was difficult for her to participate in discussions with her NES peers. Her extremely heavy course load left her little time to reach out to students in other departments. But after one year and a half in the program, she was beginning to feel better.

> Socially disconnected. Not well connected. You have some cultural differences, so you don't have a shared cultural background with the people in class. So it's hard to join discussions, to express your views, and sometimes it's hard to know what other people are talking about. But it's getting better and better. (Ying, Nov. 10, 97)

Most Chinese graduate students shared this challenge soon after their arrival in Canada. The difference is that those like Ying and Zong (see section 4.15 below) would overcome the challenge after a few years, whereas others would face it for much longer, even their entire life.

4.15 Zong

> I think for any foreigner the biggest challenge is language. Depending on profession, I think in our area, I think this is probably THE most important area. If you can do well in

> mastering the language, I think you would have a much better chance of progress in your career than somebody who is excellent in research but very poor in communication. (Zong, April 8, 98)

Zong was no longer a graduate student when I interviewed him on April 8, 1998 upon recommendation from a professor in Wood Science. He was a scientist employed by a research institute located on the UBC campus. I decided to include him as an impromptu study participant because much of what he said during the interview was about his graduate student experiences at UBC. Further, his reflections on those experiences and the insights he gained out of the experiences and those afterwards about learning English were invaluable to my study.

Zong came to UBC in 1989 at the age of 26 (see Tables 3.1-3). In China, he had earned a B.S. in Forestry and an M.S. in Wood Manufacturing. Then, he had worked there for three years at a research institute on projects of engineering and machinery design. When he entered the PhD program in Wood Science at UBC in September 1989 with a TOEFL score of 580, he was put on probation, even though he held a fellowship. His department was not sure whether he was qualified to undertake doctoral or Master's studies. Indeed, the very beginning of his studies proved tough. Two months into the program he gave a presentation for a seminar attended by graduate students across his faculty; he had to memorize a good part of the talk and not surprisingly, received a poor mark. But he did not feel discouraged. Six months later, when he gave another presentation for the same course, he miraculously received the highest mark in the class. Reflecting on this experience, he commented:

> Z: It's a learning process...I mean you know that's coming. You know that's going to be the case. That's one thing I learned. I mean you never get discouraged because you are expected to go through the steps. So I guess you learn language in lots of ways. I guess the most important way of learning is talking with people who speak well and pay attention to what they say and don't be afraid to ask question.
> J: Are you referring to native English speakers?
> Z: We don't speak English with fellow Chinese speakers.
> ...
> Z: I think the best way of learning is interacting with native English speakers, and

> watching TV. But when you do this you have to have that purpose in mind. So every time when you go through a conversation, you pick up something.
> (Interview with Zong, April 8, 98)

Zong tried to make use of every chance to learn English. It became a hobby for him. He enjoyed asking friends language questions. For example, when he made a trip with a colleague to Alberta, he asked his companion at least ten language questions. There was no pressure for him, no pressure for his interlocutor. So he had great fun. Zong was also a hockey fan. He would read about hockey, listen to hockey game broadcast on the radio, and talk to friends about hockey. Gradually he was able to understand every word about hockey during the game. Through hockey games he also learned about the North American culture: how people react to victories and defeats

In time Zong felt quite comfortable dealing with everyday activities in English. These included his comprehensive exam presentation and his dissertation defence.

> ...I had a very easy time going through the comps, which is also a presentation type of exam. I also had a very easy time going through my [dissertation] defence. I did not feel any pressure at all. The comps, in fact I had fun to do that. I really don't have the pressure because once you got the basic language ability, I mean, you can express what you want to explain. (Zong, April 8, 98)

In the beginning writing was difficult for Zong, too, more difficult than speaking. Even when he wrote the first couple of journal articles, he still had to compose in Chinese first and then translate it into English. But Zong was a quick analytical learner. When he read published writings, he would pay close attention to how others wrote and try to emulate. He even stopped reading from time to time to admire what he considered good sentences with some connoisseurship.

> I guess one of the hardest things about writing is to make it flow, make it readable. You can mechanically put what you want to express on paper, but it doesn't flow well. That tells the difference I think...just flow.

> ...
> I think writing is one of the most difficult things to do. Speaking you can manage it, but you know you are not doing well.
> ...
> I remember the first time I did a term paper, I had a hell of time to put it together actually. When you read a paper, again, just to think about how I could write the sentence, why people write this way, you almost analyze and try to find what's the secret behind the way you would write and other people would write....I found...it's such a learning curve. You really can't pick one thing - that's the way I got to a different level. It's a process. So I think I pay a lot of attention to how other people write. Sometimes I even stop and think: hey, if I write this sentence it would be different. Why? I would admire people who write well. Gradually you learn the way the native people would express themselves.
> (Zong, April 8, 98)

Zong mastered English very well. Partly on this account, he was first hired by a Canadian university on the east coast before he defended his dissertation. Then he won an award in his field. The president of his current employer, who had not bothered to interview him earlier, talked to Zong's graduate supervisor and then spent an hour talking to Zong on the phone before making his final decision to transport Zong across the country. Zong was well treated at the institute; he was one of the young scientists who were paid the highest salary in his group.

4.16 Summary

In this chapter I have provided narrative snapshots of each of the 15 Mainland Chinese participants, emphasizing their academic language challenges. These snapshots provide backgrounds of the individual participants which are important for discussions in the rest of the dissertation. In this sense, they serve to complement the analysis and discussion in the chapters that follow. Clearly, each participant was unique in certain ways. But various issues and concerns cut across multiple cases, and my interest in seeking insights into the academic writing processes and challenges of Chinese graduate students calls for a "cross-case analysis" (Creswell, 1998, p. 188; see section 3.1). I take up this analysis and discussion thereof in the following three chapters.

CHAPTER 5: ANALYSIS: WRITTEN ASSIGNMENTS AND WRITING METHODS

In this chapter I characterize some of the major written academic assignments that the student participants had to complete as required by their study programs. In particular, I examine what the faculty expected of the students in terms of course assignments and proposals for theses and dissertations, what feedback the faculty provided them, and how the students reacted to it. Then I explore in some detail the methods the students used to prepare for and complete the written work. I do so by examining the three stages that writing academic assignments normally involves: pre-writing, initial-writing, and post-writing. I must point out, however, that actual writing is not a linear process but one where writers "constantly shift among pre-writing, writing, and revising tasks" (Grabe & Kaplan, 1996, p. 19). I choose to describe the methods on the basis of the three stages primarily for the sake of presenting the methods in a certain order. In the meantime, I consider the issues involved as the students applied the methods. Finally, I sum up the major issues addressed in this chapter, in particular, the findings significant to educational research and practice.

5.1 Written Academic Assignments

The assignments that these Chinese students had to write included those for courses in their own fields or disciplines, and research proposals for particular courses or their thesis or dissertation. I present the characteristics of some of the major assignments, and then explain what the course instructors and graduate supervisors would expect their students to write, how they would evaluate their assignments, whether they would provide feedback, and how the students reacted to the faculty feedback where available.

5.1.1 Course Assignments and Research Proposals

In all cases the Chinese student participants were required to write a number of assignments for the courses they took. Some were required to write proposals for their theses, dissertations, or special courses. Ying and Ding, in particular, seemed to have written more assignments than the others (see sections 4.14 and 4.7). They not only had taken many courses but had written abundantly. Clearly, some courses carried a heavier writing load than others. For example, one course Ding took, MEDG 521 (a pseudonym), required ten lab reports (6-7 pages each) while another course, ELEC 566, which Wang took, involved only exams. The participants felt that if the written assignment chiefly involved calculation rather than language description or argumentation (e.g., for FRST 555 and MECH 555), then they would not think the assignment involved much writing. Writing, to them, meant language-based writing.

Feng, on the other hand, did not think he had a great deal of writing to do, for he had only completed three courses. For these courses he had not written any language-based paper of over five pages. So, the amount of written work one had to accomplish depended primarily on the individual courses one took and on the proportion of courses requiring written assignments.

The written assignments were in various genres including weekly exercises, lab reports, project reports, literature reviews, and research proposals. Ping and Wang distinguished between weekly exercises called assignments and other course papers. Wang explained,

> Assignments may be once a week. There are some problems for you to solve, small projects, to write some source codes, to divide the code, like an exercise. For term paper, you have to read more. (Wang, Dec. 5, 97)

Weekly exercises seemed to be the simplest to accomplish, as they tended to be problem-specific, requiring solutions to be presented in simple forms such as calculation rather than much language description. It is worth noting, therefore, that to Ping and Wang "assignments" had a special meaning, different from what we as language educators normally understand as any academic work to be completed after class.

Lab reports had various meanings depending on the courses the participants took, as the report requirements varied considerably. For Ying, a lab report was like a weekly assignment mentioned above except that her reports involved much language presentation. But Ding understood a lab report to be quite complex. For example, for one course, he had to write 10 lab reports, 6-7 pages each. Each report had to follow the format of a research paper including abstract, introduction, methods and materials, results, and discussion.

Project reports were a type of research paper in that they usually included the three major components typical of a research paper: background, methodology (or experiment procedures), and discussion of results. They also included references if the sources for those references were indicated in the text. In some cases an abstract was added; in others one component such as background might be presented in multiple parts such as introduction and literature review. Qing and Ling explained what their project reports were like.

> Q: For the courses we don't just write a report. We should do some simulation, why do it, some background, how we do it, and some results. That's the line we follow.
> J: Rationale or background, methodology or design, result. Pretty straightforward.
> ...
> Q: Most of them have calculation, figures, graphs. (Showing one assignment for a course) actually this is for the report for one course last term. This is Part One [11 pages plus 8 pages for appendices]; Part Two [27 pages plus 10 pages for the appendix] (showing the papers). All these figures are results of the simulation.
> J: A lot of figures.
> Q: Yeah, a lot in the first part. But in the second part we have some description in each part, how everything is done, how it is derived.
> (Interview with Qing, Nov. 20, 97)

> Usually for our papers, usually include abstract, introduction, methodology, result and discussion, conclusion, and reference. Usually I do methodology first, then result and discussion, and then introduction; sometimes introduction first. (Ling, Nov. 23, 97)

Thus, project reports are the assignments closest in format to the scientific articles published in academic journals. The participants seemed to understand the format very well and normally followed it in writing their project reports.

Some participants were required to write research proposals as part of their course work. For example, all those in Wood Science and Forestry Science had to take a graduate communications seminar (for two terms), for which they each wrote and presented three reports. The third report, a grant proposal (see Zong's presentation of the proposal in section 4.15), accounted for 60% of the final grade. Another type of research proposal was required for their theses or dissertations. For some participants (e.g., those in Wood Science, Forestry Science, and Electrical Engineering), the dissertation proposal primarily or even wholly constituted the comprehensive exam, also known as the qualifying exam (by passing which the participants entered doctoral candidacy). But for Ning, the dissertation proposal was totally separate from the comprehensive or qualifying exam (see section 4.6). His qualifying exam was very broad and comprehensive, whereas his proposal was narrowly focused. These two kinds of proposals, (a) for certain courses and (b) for theses or dissertations, form part of the written assignments that are the central concern of my dissertation.

The written assignments were either relatively flexible or relatively restrictive, depending on the course and the instructor. Some student participants were to write on a topic of their own interest within the broad range of the course content, especially at the graduate level, or within the field of specialization in case of research proposals. Kang and Qing explained:

> K: The supervisor and lecture let you pick up a topic yourself. So you can pick up a topic depending on interest.
> J: Pretty flexible.
> K: So, in fact I could write according to my interest.
> (Interview with Kang, Nov. 22, 97)

> I remember for this course, and the instructor allow you to choose different topics. For this one the general topic is same. This is the topic the instructor was very familiar. But

> suppose you are not very interesting in this topic, you can choose another one concerned with your thesis. Maybe that way the topic is useful for you. And you can choose that one. But you cannot choose one has nothing with this course. (Qing, Nov. 20, 97)

However, some assignments were relatively restrictive; they required students to write on only the prescribed topic. Ning, for example, wrote his comprehensive exam on a topic set by his supervisory committee. In case of a course assignment, all the students taking the same course wrote the same assignment on the same topic, such as most of the course assignments Ying wrote.

> J: How flexible are the assignments? In other words, are they flexible enough so that you can write according to your interest?
> Y: Little choice mostly.
> (Interview with Ying, Nov. 2, 97)

Sometimes it was the instructor, rather than the course, that determined the degree of flexibility of the assignment. For instance, for Directed Independent Studies, normally the student was allowed to choose what s/he would study with further approval from the supervisor. In the case of Ting and Ming, their supervisors picked topics for them rather than let them pick what they liked. Because of this confusion in understanding, Ting had to write the assignment twice. He wrote his first draft according to his interest, comparing four models for moisture absorption. But his supervisor preferred that he characterize the absorption of five tree species in British Columbia, a personal interest of the supervisor. So Ting had to start all over. Ting reflected,

> Oh, I remember I wrote four drafts for the directed study. The first one was total garbage according to the prof. He said I did not understand him [his requirements]. It's like this. I'm not sure if I did not understand his question as a directed study has no writing prompt. You write on what you decide on. But after I decided my topic, he said what I wrote did not address my topic at all. I originally planned to compare four models for moisture absorption....I used four models to predict how much moisture they can absorb. I compared four models to see which one is more accurate, which one has more potential for use. I needed to find out if the amount of absorption is accurate for each of the models or how much the differences are. Another thing I wanted to find was how much moisture can be accumulated as a result of absorption. I tried to compare on these aspects. The prof

> said that it was my idea but nobody had ever done such comparisons. Not reliable. Then he wrote a topic for me to describe the characterization of absorption of five species [of trees] of BC. There's a big difference. I focused on four models; now he wanted me to focus on five species. But there's little difference among the five species. So my second, third and fourth drafts had to refocus on the differences of the five species. It is maybe my lack of understanding or maybe a mismatch between my interest and the prof's. (Ting, Aug. 29, 97)

Not surprisingly, Ting felt very unhappy about his supervisor's lack of respect for his interest. By the time of the interview he had not fully recovered. He was actually feeling rather pessimistic about his future in the field of his program. As is now evident, written assignments differed considerably depending on the particular course or project and the instructor(s) offering the course or supervising the project. I focus more on the second factor below.

5.1.2 Faculty Expectations and Feedback

5.1.2.1 Faculty Expectations

Examination of the data from the student participants revealed some variation in faculty expectations on the written assignments produced by the Chinese students. Many faculty members in the sciences seemed to place a higher demand on the linguistic aspect of the students' written assignments (than their engineering colleagues). As Hang quoted his professors, his papers must be publishable, which suggests high standards for all aspects of the paper, language and content included.

> H: All the instructors said that our papers must be publishable.
> J: Publishable.
> H: This guy asked me to do that even though the paper may not actually be published.
> (Interview with Hang, Dec. 15, 97)

This demand was evident when Ling's supervisor time and again tried to help her correct the language errors and improve the clarity in her paper for the Directed Study. Ning, on the other hand, received the lowest possible passing mark for a course because of his language, and was advised to take language lessons. The requirement of attending to language was further indicated in my interviews with the science faculty, who claimed to consider the formal aspects when evaluating graduate students' papers. To me as a graduate student in education, this demand does not sound surprising at all as my instructors constantly remind me to write publishable work.

However, the student participants in Electrical Engineering did not perceive a high demand in terms of language for the assignments (though the faculty did insist on correct language in the theses, which are documents accessible to the public). In terms of content, they were still required to produce graduate-level research, as discovered in my interview with Ping:

> P: It means because I'm not the first Chinese student the professor has. They know Chinese students or some other foreign students. So their expectation is not very, very high.
> J: You do not have much difficulty. Do you think they have different expectations for Chinese students than for Canadian students?
> P: Just with respect to the language itself. For example, they ask you to give a presentation. You speak slowly, not very fluently. They will not regard this as 'oh, you have not done the research work very well.'
> J: Your research is still good if it is good.
> P: Yeah.
> J: In terms of research, content, you are on equal basis.
> P: Yes.
> (Interview with Ping, Nov. 29, 97)

Xing agreed with Ping, explaining that the faculty focused primarily on the content of their writing - how the students conducted, or would conduct, the process of the project. Their writing style was less of a concern. The faculty would at best give suggestions on how to modify the writing if they were not satisfied with it. Based on their study of academic writing assessments at an Australian university, Ballard and Clanchy (1991), similarly, concluded that faculty in academic disciplines are more concerned with thinking skills, content explication, and culturally appropriate attitudes to knowledge as represented in the ESL students' writing than with language accuracy. As Wang and Ping in my study explained, the faculty assumed that as graduate students, the participants had mastered English prior to their enrolment and that how to write papers was the students' own business. This assumption was based on a prior requirement of satisfactory TOEFL scores of 600 or above for Electrical Engineering. But Ray, a professor in Electrical Engineering, doubted the reliability of TOEFL as indicating the students' language proficiency to meet academic demands.

Though many faculty members in the sciences placed high demands on the formal aspects of students' writing, others seemed to closely resemble the faculty Xing and Ping referred to. A good example was supplied by Feng (see Appendix H, with my markings). Even though the report contained various formal problems such as grammatical errors and non-parallel structures, the instructor gave it a 90%, commending the impressive research Feng reported having conducted. Clearly, the faculty differed tremendously in their expectations, even within the same department.

Another expectation of some faculty was for detailed information. Some of the students found this particularly hard to meet, as least initially. The faculty expected the participants to describe the background, methods, and so on in detail. But as Ning complained, at least one of his instructors, did not communicate this expectation to him. Naturally, he would not know. Nor did the faculty provide details of his evaluation criteria. So Ning had no idea what a good assignment should look like. This lack of clear expectations caused Ning much frustration:

> N: He said not enough. You have to write more. Before, I wrote two pages, I don't know. Finally I wrote 12, or 15 pages.
> J: Did he specify how many pages it should be?
> N: No. Later I know at least 15 pages.
> J: But in the beginning you didn't know?
> N: I think I had idea. My idea is new. But I didn't put my idea in details. They require everything in detail, e.g., the method, which method are you using? how you do this experiment? Like a proposal. Not just a idea. You have to write everything. So just find

> everything, very in detail.
> ...
> N: Not clear to students how to write a good paper. OK. It's clear in evaluation [marks], but not clear what kind of paper is good paper, something like that.
> J: I see, more descriptive terms about the evaluation criteria.
> (Interview with Ning, Dec. 5, 97)

Bing had a somewhat different perception on the requirement for detail. In China, if she was asked a question, she just needed to directly answer the question; she did not have to provide additional information, extra details, or supporting evidence, unless that was part of the question. Trying to offer too much unsolicited information could be boring or even insulting to the professor because of the underlying assumption that the professor was not knowledgeable enough to comprehend the students' answers (see also Edwards, 1998). To Bing, details that were not directly asked for would be irrelevant for the question:

> B: Here when I answer the question, usually my answer is too short, like several sentence. But some professors, they need more. They just thought you didn't grasp the points. So they thought we should answer more in detail. But for me I think that thing is just outside [irrelevant].
> J: I see. You think more details would be irrelevant.
> B: Yeah.
> J: What do you do then if the professor asks for more, more? Do you try to give more later?
> B: If I can't remember, how can I give more information about it?
> (Interview with Bing, Jan. 5, 98)

As she explained in an earlier interview, Bing paid close attention to the results of her experiments but made few efforts to record or remember the processes. To her, the results were the most important. Naturally, she found it difficult to provide all the details of the process afterwards.

5.1.2.2 Faculty Feedback

Normally if faculty were to provide feedback on students' written assignments, they would do so right on the assignments or assignment drafts, which they would then return to the students. However, while some students regularly had their assignments returned, others received their work far less often. The former group included those from Wood Science, Forestry Science, and Audiology and Speech Pathology (such as Ming, Ting, Ling, Hang, Feng, and Ying). The second group were all from the two engineering departments and Food Science (such as Ping, Kang, Bing, and Ning). One reason the faculty gave for not returning the students' work was that the marked paper would usually show the mark awarded to the paper. If the student was not happy with the mark, s/he might approach the instructor for an explanation - especially if the paper also contained some language feedback which the students found hard to understand. When I brought up this concern in my faculty interviews, Prof. Smith confirmed that this was his reason.

Varieties of feedback

When the students did get their written work back, the feedback they received varied tremendously. Ling and Bing received detailed feedback from their supervisors on the language, clarity, and content of their writings for the research proposals and courses they took with them. Their supervisors even corrected many errors and offered alternative expressions or rewrites (see samples in Appendices I and J). Ling's supervisor even provided feedback on her papers for courses taught by other instructors. After the written feedback, Ling would meet with her supervisor, who would then offer oral comments in the fashion of a conference. Ling commented,

> Also I discussed my work with my supervisor. He is very helpful. He is a good writer. Usually every time when we write something, we show him and he will do many corrections and then return to us and then correct again and then show to him. Repeat. It's quite helpful. (Ling, Nov. 23, 97)

The feedback Feng, Ping, Qing, and Kang received on their written work related to content only while Hang and Ying each got feedback on one course paper focusing on the language including grammar, spelling, and punctuation. Hang had another paper read by a professor who paid almost exclusive attention to matching references in the text with the bibliography. For one initial draft for a course Ning was asked to provide more details. In other cases, the feedback was either very brief (as on most of Ying's papers) or absent except for a grade or mark.

Those who received faculty feedback also said that their supervisors usually provided much more feedback and one-on-one conference to them than did other instructors. They gave two reasons. First, the supervisors felt more responsible for the supervisee's academic well-being; second, their supervisors were also their employers, so they inevitably had more opportunities to meet. In fact, Ling, Bing, and Feng saw their supervisors almost every day they were in school. The employer-assistant relationship naturally led to a third one in co-authorship: Ling, Feng, and Ding co-wrote academic publications and presentations with their supervisors. Such close collaborations were bound to yield not only feedback on the "co-writings" but by habit, on the students' course assignment writings as well. Not surprisingly, some of the assignments Ling and Ding wrote for their supervisors' courses turned out to be publications and presentations co-authored with their supervisors.

Effects of feedback

What effect did the feedback, or lack of it, have on the students' writing? In most cases when faculty feedback was provided, it made a difference in the students' subsequent writing. This happened at least to Ling, Hang, Bing, Ming, Ting, and Ning, because they paid attention to the comments and suggestions and tried hard to follow them.

On the other hand, when the assignments were returned with no comments or corrections, Wang cared only about his grades and Ping and Xing threw them out. The feedback had almost no effect on Ying because it was too brief and sometimes so late - as in the following term - that she had lost interest. When I asked her, she complained:

> J: Do you get your paper back from the professors?
> Y: They give you back but quite late. Simply when you want to find the answer, they wouldn't give you back on time. But when they give back, you don't care that much.
> J: So you care period is past.
> Y: Yeah.
> (Interview with Ying, Nov. 24, 97)

Some participants such as Ming, Ting, Feng, Ping, and Kang mentioned that their faculty never made high demands on the writing proficiency of ESL students but placed more emphasis on content and ideas. As a result, the students did not pay close attention to their written language, knowing they would not be penalized for language or other formal imperfections (see Appendix H for such a sample). Ironically, when the faculty marked Ming's and Ting's papers, they picked more grammatical and typographic errors than anything else. So, even though some of the faculty did not explicitly ask the students to improve their written language, they showed little tolerance for language errors when marking the papers. For that reason, Ming learned to have other Chinese students proofread his drafts before handing them in.

Ping held a different view on feedback on language. He thought that if professors picked out his language errors, that might affect his grade, which would be unfair because English was his second language. He should not be judged by the same linguistic standards as those applied to native English speakers. He reasoned in one interview:

> P: ...if he took language into consideration, then international students will get lower mark than Canadian students.
> J: I see. You think instructors should not comment on your language?
> P: As far as it is not too bad to make yourself misunderstood, I think. But for the thesis, it's totally different.

> J: Why?
> P: Because your thesis will be kept in the library, in different places. People later will read them. So it's a formal one. But for ordinary assignments or paper, to say something frankly, after some time they are thrown away.
> J: I see. So the instructors care whether the papers will be read by the public or will be read by himself and yourself.
> P: And if for a long time or the time being.
> J: I see. If he picks on your language, it's probably unfair for students for whom English is a second language.
> P: I think (so).
> (Interview with Ping, Nov. 29, 97)

However, if language errors are not tied to marks (except in the case of serious problems), such feedback should be welcome to all the student participants because they desired to improve their English, to improve their academic performance, and to be competitive as they had always been back in China. The conditions for education in China were such that only the most competitive were able to enter the university and the graduate school. Even Ping, ironically, implied a desire for negative feedback, as long as it was not tied to the grade.

> The problems is, the general impression you give is you are not a native speaker. I know it consist of many specific errors. But I'm not clear, myself is not clear about that.
> (Ping, Nov. 8, 97)

Thus, Ping felt students might not recognize their writing problems or weaknesses unless someone else, such as the supervisor, instructor, ESL teacher or tutor, were to point out and explain the problems and then preferably suggest alternative expressions.

The following interview excerpts display the students' desires for feedback and why it was important to them.

> N: Sometimes you need feedback. That's very important. Feedback not means you really point out that point. But feedback is in one sense to me encourage. It's source of energy. No matter whether this is something right or wrong, give me energy, OK? It kind of remind me a lot of thing. For example, I said someone told me to speak slowly. Everything, suddenly, light my brain.
> J: Enlightened.
> N: Enlightened.

> (Interview with Ning, Dec. 5, 97)
>
> I just expect them to give me feedback. OK. Let me know how I can improve my writing, which sentence, which paragraph, and where I need to improve. I need exactly information.
> J: Reasons and explanations why you should change.
> (Interview with Ning, Jan. 2, 98)
>
> Oh, if they have time, if they can, rewrite or point out my mistakes, my inappropriate usage and return my assignments, my paper, my thesis to me, I think definitely it's very helpful.
> (Ping, Interview, Feb. 9, 99)

For Xing's research on automatic control systems, faculty feedback was not only desirable but absolutely essential as his success in designing the system depended on feedback. He was still wishing for more feedback when I interviewed him:

> X: Sure. Actually you know, the field I'm learning is control. Automatic control system is a feedback system. Without feedback you can't implement automatic control system. This is very crucial I think for you to get information from others, correct your action.
> J: Feedback is essential for your studies. Maybe next time you should ask for feedback if the instructor doesn't give it to you. Ask for it. Maybe they will think about it if you ask.
> X: Yeah.
> (Interview with Xing, Dec. 20, 97)

As can be discerned, the participants not only preferred to receive corrective feedback indicating places to be corrected or revised, or even better, providing "correct" rewrites; they also longed for comments which would reassure them that they had done well in certain parts of the paper. To them, such positive feedback, which I might call *psychological nourishment*, meant encouragement from the professor, reinforced confidence, and motivated them to carry on their studies. But depending on the nature of the problem, feedback alone may not be sufficient. Student conference after written feedback, that is, *interactive feedback-based conference,* is much more effective than feedback alone, which is better than no feedback, which is in turn better than not returning students' assignments. But unfortunately, the latter two practices seemed most common among instructors in engineering programs.

At a conference, the instructor meets with the student on a one-on-one basis and talks over the written feedback, explaining what s/he wants the student to do and why, and answering (further) questions the student might have on the instructor's comments and intentions. The conference can build up a closer relationship, which Chinese students appreciate and which can translate into motivation. Ling and her supervisor, Prof. Ellis, seemed to enjoy a good student-supervisor relationship, which partly accounted for the vast progress Ling had made in her English and her interest in conference presentations.

At the request of the students, and partly in return for their participation in my study, I proofread some students' papers, wrote feedback on the papers and met the students to explain my feedback. The students appreciated the meetings because they were able to see their weaknesses, and understand my explanations and suggested changes. On the other hand, without conferencing, feedback may not be very helpful if students have difficulty understanding the feedback.

In addition to the insights I obtained through contacts with my participants, I learned more about the problems of feedback and the value of conference through e-mail discussions with Helen, a doctoral student at another institution who was also observing the academic writing of Chinese graduate students (see Chapter 3). On the problems of feedback she wrote:

> ...maybe for some students, simply learning to decode the feedback is akin to learning a whole other language. (April 21, 98)

She continued, pointing to the value of conferencing:

> I also have a theory - that students from more collective cultures may be more inclined to learn through personal contact, whereas we who have grown up in the west may be more willing (though it still isn't as much fun) to learn from decontextualized marginal feedback. That is, my Chinese students know the principles, they read the feedback, but it's only when they really have to get something right - and they get the chance to chew it through with a faculty member or friend, or with me - that they really take it in. So once again this points to the value of conferencing over written comments.... (April 21, 98)

I saw other values of conferencing:

> To me, conferencing simply supplies an opportunity for explanations which (hopefully) can drive the message across to the ESL student. For example, if the student still does not understand after an explanation, the professor or tutor could try another way to explain. Mere written feedback simply cannot afford such needed and (usually) appreciated interactions. (Jim, April 21, 98)

And we agree that conferencing lets students feel that faculty care:

> The other point I'd like to comment on is care. I think Chinese students are used to being cared for/about since childhood....Thus whether the supervisor is caring or not makes a big difference to the success or failure of a Chinese student in his/her grad studies. (Jim, April 26, 98)

See Appendix G for more excerpts of the e-mail discussions on conferencing. In my study, only Ling seemed to have benefited regularly from conferences with her supervisor. This is not surprising since most of the other students often did not have their papers returned.

5.2 Academic Writing Methods

In this section I describe the methods which the students used to complete their written assignments. In particular, I focus on those the students used in the three stages that writing academic papers typically involves: *pre-writing*, *initial-writing*, and *post-writing* (though actual writing may not assume a linear process, as pointed out at the beginning of the chapter). I take *pre-writing* to include the stage when students learn to write academic papers prior to writing, as well as planning or preparing to write a given paper, although learning to write continues through the remaining two stages. Thus pre-writing involves methods for learning to write in general, reading source materials in order to write a given paper, and planning to write the paper. *Initial* *writing* here indicates the stage during which students literally compose or try to compose the initial draft of an assignment in part or whole. The first attempt at a text may yield as little as a sentence and as much as a paragraph or more. *Post-writing* ensues when the student has finished composing and tries to revise and/or edit the initial draft. These three stages serve as a heuristic path for me to describe the methods applied to academic writing, which are my primary interest. Hence, I focus on the methods applied rather than aiming at a seamless typology of the stages which are bound to overlap.

5.2.1 Pre-Writing Methods

5.2.1.1 Imitation

My interviews with the students suggested that the most common and fundamental approach they needed to learn to write was imitating model papers. Since few students had received much English-writing instruction or had had many opportunities to write extended English texts (such as a complete essay) before, it was natural that they imitated what they believed to be good models. The most common models for them were the reading sources: journal articles and some books in their disciplines. For some, TV programs and speech by native English speakers also served as model language input for writing.

However, the students differed in the ways they imitated others. For example, Hang would first try to memorize expressions and sentence structures from readings, and then translate the readings into Chinese and then back to English. By comparing his version with the original, he tried to learn the English style of writing:

> H: I think memorization is important.
> J: Do you mean words, sentences, expressions [phrases]?

> H: I think expression, and sentence structure. The words are not important. When I want to remember something, generally speaking I remember the expression, what expression they use in writing.
> ...
> J: In your opinion, how did you learn to write English papers?
> H: Imitation is very important. I translate into Chinese and then back to English, just to imitate the style.
> J: Right, the structure, style, language, everything. Through translation you imitate the language.
> H: Yeah, what I do is just to imitate.
> (Interview with Hang, Dec. 15, 97)

Xing also emphasized the value of imitating articles, which he thought symbolized high standards. In order to write good papers, he had to try to follow their style and organization:

> When I want to write something, at first I don't know how to write it. Actually I think write a paper is good or not should have a standard. Maybe the best standard is what other people use in the renowned journals. So I read various journals, I pay attention to how they structure, organize.
> (Xing, Nov. 18, 97)

Ding liked to watch TV programs such as "Seinfeld," which the teacher in his advanced ESL class had used; he would take note of what he thought to be good words and expressions, and later try to use them in his own writing. Unfortunately, when he moved to a new house without cable TV, he lost access to many good TV programs.

On the whole, it seemed that course readings supplied the best models for the students to imitate. However, not every paper written by a native-English speaker could serve as a good model. As Ping found out, some papers contained poor writing, including obvious mistakes.

> Just by the way, originally I thought every native English speaker can write very good English. Some time later I found it's not true. Some people, their first language is English, they also make mistake. I'm not referring to casual [occasional] mistake - they repeatedly make some mistake. So I think when you choose the paper or thesis, be careful.
> (Ping, Interview, Feb. 9, 98)

Ping suggested that ESL students be selective and critical when reading models. Some so-called "models," by virtue of being NES writing, were actually examples of poor careless writing. In my own reading of academic papers such as those contributed to *Educational Insights*, a graduate educational research journal, I have frequently come across NES writings with numerous mechanical and stylistic errors. This suggests that even some experienced NES writers may face challenges in producing competent writing (see also section 1.2)

The reading sources actually served a double function: they not only supplied models for writing, but more importantly, also supplied information on the subject matter the students were seeking. As reading sources for information constitutes an important procedure in preparing to write academic papers, I look briefly at what sources the students read and then examine some specific methods they used.

5.2.1.2 Reading Sources

As indicated earlier, academic journal articles were usually the most common sources for information the students read. As graduate students, they were more concerned about research-based information, whereas textbooks often supply basic information, more regularly used by undergraduates. Still, the students in engineering seemed to use textbooks more than those in the sciences. Though Chinese was their native language and most of their publications in China had been in Chinese, the students seldom referred to Chinese sources. One reason was the scarcity of Chinese journals; another was that as knowledge is always constructed in social, cultural, and historical contexts (Norton, 2000), the research conducted in China might not be immediately relevant for their written assignments. As Ming commented:

> I think it's [his 20 plus publications] all useless. It all belonged to history. No matter how good your academic background in China was, once you come here, you have a 'blank

> page.' (Aug. 25, 97)

Thus the students typically read only in English. In order to find useful articles, many resorted to CD-Roms and websites for abstracts and references. This reference information helped them locate the articles to read. Often too, the articles to read were clearly stated in the course outlines. Xing summarized his reading sources in a way typical of most participants:

> First, journal articles. They deal with specific problems in depth and up to date. Second, textbooks. They provide a foundation and broad coverage but not too specific. Third, world wide web information. (Xing, Nov. 18, 97)

5.2.1.3 Reading Methods

In order to gather conceptual information for written assignments, the students usually had to read source texts. When searching out articles to read, they were very careful to select those with the most potential to supply the desired information. One method to select articles to read, or to determine if a given article was worth reading, was going over the abstract. For example, Xing explained, "I usually browse the article first, look at the abstract. If not interesting, I discard it. If interesting, I'll read carefully" (Nov. 18, 97). Once they found the articles, they would often read selectively, by attending only to the parts that could best provide the information they were seeking. These parts were often the introduction and conclusion, and sometimes the methodology or other sections. If the article was very important for their written assignment, they might read it thoroughly, and even a few times:

> Sometimes some important articles, I read all the parts. Sometimes I just read method, conclusion, etc. I get what I want because I don't have that much time to read everything. Too much literature for one paper.
> (Ning, Dec. 5, 97)

> ...But first, I read the abstract, but if I don't find the abstract interesting, I just forget it. But if I find the abstract important for me, I'll read the paper. But I think there is a different situation. Sometimes I just want to check info about preparation materials, methods. I just find the paper and read this part.
> (Ling, Nov. 23, 97)

Xing and Bing highlighted sentences that contained potentially useful information. Thus when they had to review a certain article they had already read, they just needed to look for the highlighted parts:

> I use a marker to highlight important sentences. When I go back to the article later, I don't have to read everything again. I just look for the highlighted parts.
> (Xing, Nov. 18, 97)

But if an article was very useful, they would read it thoroughly and might even follow up on the references, as Ding did. They might even read the article a few times, especially if it was not an easy piece. As Ping described it:

> P: It depends the situation...if I encounter something not very familiar or I find it hard to understand, I read sentence by sentence. Sometimes I have to read it again and again.
> J: It is hard to understand.
> P: So depends the situation.
> J: But when you get hold of an article, do you scan?
> P: Yes. And try to find out if it is interesting.
> (Interview with Ping, Nov. 29, 97)

In sum, to decide which journal articles to read or whether to read a given article, the students would first read the abstracts and/or introductions, or scan the whole piece. Then they might read selectively, attending only to the parts that might contain desired information or interest. Often, the reading amount, language difficulty, and time pressure were considerations for selecting readings. Alternatively, if a certain reading source was crucially important and especially if it also presented challenges for comprehension, the students would read it thoroughly, and in some cases, several times. Occasionally they even had to follow up on further readings suggested in the references of the source.

When the students read English sources, they used English and/or Chinese for thinking. The choice varied with their habit, the reading difficulty, and their prior knowledge. If they were in the initial stage of studies in the English milieu and still had limited English but much corresponding knowledge base and terminology in Chinese, they tended to fall into their previous habit of thinking in Chinese. As their exposure to English accumulated and their attempts to think in English increased, they gradually began to think more in English. However, some developed faster than others. At the time of my interviews, when they all had studied at UBC for at least two terms, most were thinking in English most of the time while reading the English sources. I focus my discussion here on some specific situations with special attention to complexities.

Situation A

If the language of the reading source was difficult, and especially also if the content was unfamiliar, some students tended to think in Chinese, particularly when their English proficiency was on the lower end and they were used to thinking in Chinese. In doing so they would have had to translate the reading, at least in part, to Chinese in order to comprehend the text. Hang provided an example.

> H: I think in Chinese. I cannot do in English. Maybe my English is too poor.
> ...
> J: So right now you are still thinking mostly in Chinese.
> H: Yeah. But for some material, if I very familiar, I can just English idea. But if I met some material I'm not very familiar, I should translate into Chinese.
> J: You said you think in Chinese. Why do you do so?
> H: Just accustomed.
> J: Did you consciously try to switch to English?
> H: Yeah, sometimes I try but doesn't work well.
> (Interview with Hang, Nov. 25, 97).

Situation B

On the other hand, if the reading was not difficult, they might be thinking in English. But when they came to a difficult word or sentence, they would either ignore it or switch to thinking in Chinese in an attempt to figure out the meaning. They almost always had the option of consulting a dictionary but obviously, did not often bother to do so. For example, Qing (Nov. 20, 97) explained, "Actually when I met some words I didn't meet before, I think in Chinese [in order to guess]." For this practice, Kang supplied a good reason: Chinese, being his first language, allowed him to access his prior cultural background knowledge, to think logically, and to make a sound guess. He reasoned,

> K: Yeah, if I met some tough sentence, I really can't find the exact meaning to explain that in English, so I will come back to my mother language, because when you [try to] understand some sentence, you have to use your cultural background to understand that. I think you must have such experience, right?
> J: Sometimes I do.
> K: So you have to come back to your mother culture background and get a sense about that, and go back and you understand what this [is] in this English environment, what's the meaning for that.
> J: You mean to process that information to get your thinking or concepts/ideas straight?
> K: Because sometimes when this word, you know its meaning, and the environment, the other word, you know the meaning word by word, but you don't know -
> J: - the contextual meaning.
> K: Yeah, contextual meaning.
> (Interview with Kang, Nov. 22, 97)

I must point out that Kang was referring only to situations when he accessed a broad basic cultural background and found it helpful. Qing, Ming, and Ting did so when they had a specific knowledge base in Chinese, as they studied in the same fields as they had done in China.

Situation C

Several students (Ying, Ning, Ding, and Kang) were studying in areas at UBC different from their educational background in China; if a specific knowledge base in Chinese was called for but unavailable, they might think in English:

> Actually my major is different than before. Sometimes I even cannot think in Chinese. I don't know how to say in Chinese. I have to think in English.
> (Ding, Dec. 15, 97)

But this process of starting anew was an uphill struggle at least in the beginning. When the students' English is not very good, they may have to translate the English into Chinese to understand and remember. But if the students have a good command of English, they are likely to comprehend and remember the English phrase in English, as Ying did. Ying was an English major in China but at UBC, she studied audiology and speech pathology.

Situation D

While most students would comprehend the English text in English since they had little difficulty understanding the language, they had to process and retain the information in Chinese. Ping explained why he had to do so.

> J: But when you do reading, it's mostly, or almost, always in English.
> P: Yes. Almost always because I'm forced [to think in English].
> J: Why do you think you are forced? What forces?
> P: Because I'm very interested, I'm concentrated in reading the contents. And I have forgot whether it's English or Chinese. I need just to know the content. Because the content is written in English, so my thinking is forced this way.
> J: Therefore your concept must be English too.
> P: Yeah.
> ...
> J: But how come here you said you translate into Chinese in order to memorize it?
> P: Because when I reading, I just got the concepts. But I cannot get the exactly way, the whole way to express the concepts in English. So if I try to remember the whole thing, I cannot do so in English.
> J: So it seems that while you are doing readings, you think in English. But after you finish the article, then you come and sit back to process the information in Chinese?
> P: Yes.
> J: Why do you do so?
> ...
> P: Because - I cannot think always in English. I can not. That's the reason. If I can, I don't bother to translate between Chinese and English. That's the reason. But when I was

reading, I can't because everything has been written here. I just get. But I cannot process myself all in English. That's the problem.
J: What's the difficulty?
P: I think there are two difficulties. One is habit. I'm used to doing so. The second is there are some problem because I cannot remember exactly how such meanings are expressed in English. I cannot do it all by myself. And also it's not convenient for me. You know people like to do things if possible.
J: So it's easier for you to process it, or bank it, keep it in Chinese. You have a more solid memory if you keep it in Chinese. If you keep it in English, you may lose it.
P: Yes.
J: Is it because you cannot relate to your Chinese background?
P: It's part of the reason.
J: You have to do – as we call it - information restructuring. So you have to relate to something you learned before. What you learned before was in Chinese.
P: A lot of my concepts is in Chinese.
(Interview with Ping, Nov. 29, '97)

Wang was even more dependent on Chinese. To him, Chinese was the only means through which he could feel secure about what he learned.

J: So while you read, it's in English. After you read, you process it in Chinese.
W: I think so.
J: Because you want to relate to something you learned before.
W: Most probably in Chinese. I think only when you say in your mind in Chinese, OK I understand, then you are really understand about this paragraph. And if in your mind, your Chinese is totally a mess, then you really don't get the point.
J: Then the English is not quite reliable.
W: Yeah.
(Interview with Wang, Dec. 5, 97)

It is worth reiterating that in the reading process at their particular stages, these students used English to gather information, but used Chinese and their Chinese knowledge to process and retain the information. What was involved here was a process of information restructuring (McLaughlin, 1990), resulting in a reconstruction of knowledge with added or modified ideas. If they tried to store new concepts in English, they might either forget the concepts quickly or simply not mix them with the Chinese concepts. Hence, no information restructuring would occur.

5.2.1.4 Reading-Writing Relationships

Connor and Kramer (1995) observed a lack of in-depth analysis of the relationship between reading and writing in graduate disciplines. With this call to action in mind, I tried to find out what reading-writing relationships were like to my student participants.

As indicated in Chapter 2, the assignments the graduate students in my study undertook were typically text-responsible academic writing (Leki & Carson, 1997). That is, the writer must display knowledge of the content, and possibly limitations, of the source text(s) and/or some other external realities such as experiments and field work. In other words, the students must usually read source texts in order to write. But how did the students make use of the readings in order to write the assignments? And what did the students see as some of the reading-writing relationships?

Without doubt, one of the main purposes the students had for reading source texts was to learn the content or ideas related to their assignments. Sometimes they would evaluate this knowledge critically to find the limitations, upon which they could generate their own research. Xing, for example, developed his research space from the source texts he read:

> Through reading I know what has been done on a topic and what methods have been used. Then I know what the drawbacks for those methods. This way I find my own research topic and sometimes try to improve those methods. (Xing, Nov. 18, 97)

The students sought not only the content of the readings but also the form, namely, the language such as sentence structure and expressions, and style such as the structure and format of the source texts. They took the form as their model to imitate or emulate. However, how a student practiced this approach could vary. For example, in order to imitate the source texts (i.e., the language), Hang tried to translate his readings into Chinese, and then translate the Chinese back to English. He compared his translation with the original texts, thus finding out where he either made mistakes or was weak. Reading alone, to Hang, was not sufficient for him to learn to write a similar text:

> H: [It takes] A long time, but I think it's very useful. Just to read is not very useful. Just reading, I cannot find some problems. But when I write it, the problem came.
> J: So you would compare your translation with the original article.
> H: Yeah, sure. When I translate to Chinese I put it aside for a week or two, then I translate the Chinese back to English.
> J: Was your English very different from the original?
> H: Very different, but for academic article, if you do several times, you get used to the style.
> (Interview with Hang, Dec. 15, 97)

Through translation he could learn the vocabulary, sentence structure, and style of the source texts. While some ESL students may favor this kind of translation at the initial learning stage, it tends to restrict the extent to which they can write while thinking in the target language. Thinking in English, I would presume, is a basic requirement for advanced ESL students to write like a native English speaker. Not surprisingly, Hang thought in Chinese during his writing, as well as most of his reading, throughout the period of my data collection.

Wang was another student who frequently revisited the source texts. But he was looking for expressions for the ideas he already had in mind, or was trying to remind himself of what he remembered from earlier readings. So it may be inferred that Wang learned the expressions mainly through memory, which so often fades over time and may need to be refreshed. Consider the following interview excerpt:

> J: When you later write papers, do you go back to it [a source text] for information or for expressions?
> W: I think most of the time for expressions - how to expression this idea in English. Actually you have the idea in your mind but you don't know how to express it.
> ...
> J: Is it like phrases or whole sentences?
> W: I think whole sentence, actually the structure of the paragraph, how to express it clearly, and you can learn from it.
> J: So when you refer to those sentences in order to write your paper, do you just try to learn and study those expressions or do you like, use them in your paper without any

> change, or do you try to use some of the words but use your own sentences?
> W: Actually I try to use some new words from...to replace, to do substitution, and try to learn the sentence structure and try to use it in the future. Sometimes you know it but forget it. You have to go back several times.
> J: But you don't copy, like whole chunks.
> W: You mean direct copy everything, no.
> (Interview with Wang, Dec. 5, 97)

To Wang, expressions meant not just phrases or technical terms but also sentence structures, paragraph structures, or even complete sentences from the source. However, Wang was fully aware of the implications of plagiarism and tried to avoid it by using some substitute words. To him, unless it was direct copying, or word-for-word copying, it should not be considered plagiarism (see section 2.3, 5.2.2.3, and section 7.2 for more on plagiarism).

It may be observed that simply reading good writing from sources such as journal articles might not help the students much with writing, but paying attention to good expressions may actually enhance the process of learning to write (see Schmidt, 1990, for the role of consciousness in learning a second language). Still, attention to and memorization of the expressions did not prove sufficient for some of the students to learn to write well. Therefore, they would go beyond memory to pay attention to, or study, how competent native English-speakers compose texts, and learn the *how,* not just the *what* of the source texts. Zong, for instance, when reading good writing, would often stop to analyze the text, try to find the thinking method underlying the writing, reflect on his own thinking method, and notice the difference. That way, he was able to imitate, or learn, not only what met his eyes but how to compose his own good writing. The following segment documents his approach and my response during the interview.

> Z: I remember the first time I did a term paper, I had a hell of time to put it together actually. When you read a paper, again, just to think about how I could write the sentence, why people write this way, you almost analyze and try to find what's the secret behind the way you would write and other people would write...Gradually you learn the way the native people would express themselves.
>
> ...
>
> J: I think you made a good point just now about paying attention to language, not just

> grammar but the structure and what makes it good writing, what makes it good style, and that's really special and I think that's what can make your writing at least close to native writing.
> (Interview with Zong, April 8, 98)

Learning how to write from source readings through understanding undoubtedly is more challenging than learning what to write through memory. But the effect is different. One not only learns how to write but learns it more permanently.

Another way writing related to reading was that the students made use of the readings to create the writing mood/sense. Almost all the students emphasized the importance of reading right before writing. It seemed that immersing themselves in the source readings helped create a mood in which they would feel like writing, and writing like their reading. Obviously, it is not difficult to see that immediately after reading, one has a better sense of what one reads in terms of both the content and the form. For the students this sense could translate into an understanding of their course assignment or research topic. For some of them, this sense meant an understanding, or sometimes a fresh memory, of the language, paper structure, and style of what they were about to write. Wang described this process:

> J: What have been the effects of your readings on your writing?
> W: Actually if you read more, after that, you write, will be fluent or much easier.
> J: In what ways?
> W: Actually I don't know how to say. Just a kind of feeling. After you read a lot, you just feel you want to speak in English, you want to write in English.
> J: You are in the mood. Create a mood for you to write in English.
> (Interview with Wang, Dec. 5, 97)

Not surprisingly, once that reading momentum discontinued, their sense of writing (i.e., writing competence) might become weaker, to the point of once again not knowing how to write. This happened to Bing.

> J: Does your reading help your writing?
> B: Yeah, sometimes they did. For the last two term when I took the courses, my writing is

> getting better. But now after I stopped reading and taking courses, I think my writing, I don't know how to start.
> J: You feel more rusty?
> B: Lose confidence about my writing.
> J: How long have you discontinued writing?
> B: Almost a term or two.
> (Interview with Bing, Dec. 8, 97)

So when Bing came to writing her Master's thesis, she would have to re-read the references. Similarly, after Xing had been writing English on and off for ten years, he concluded that his writing ability was closely related to how much he had just read prior to writing.

To sum up, individual students used readings in their own ways to benefit their writing, depending on their habit of source-referencing and the particular context in which they undertook a given assignment. The way they used the reading sources in a given situation determined how they perceived the reading-writing relationships in that situation. Therefore, while they normally took readings for granted as sources of information or concepts, the readings also furnished models for writing for the students on the level of form, ranging from vocabulary and sentence structure, to the organization and style of a genre of writing. In other situations, the readings served as raw materials in the creation of a writing mood which immersed the students so that their writing would flow. Obviously, in certain situations several of these phenomena might occur at once.

5.2.1.5 Planning/Outlining

Following reading sources came the process of planning writing. Analysis of the data yielded two groups of writers, the *planners* and *non-planners*. The planners usually formed an outline, either mentally or physically, about what they were to write for an assignment. Thus, this group included *mind-planners*, who planned mentally only, *paper-planners*, who planned on paper, and *computer-planners,* who planned on the computer. Non-planners did not habitually create a definite blueprint upon which to base their writing.

Among my student participants, Ping was a good example of a mind-planner. He explained his planning process:

> P: First I will try to find sufficient materials. After I think I have collected enough, I will first make an outline. Although I often do not write them down, but I do have an outline.
> J: In your mind?
> P: Yes.
> (Interview with Ping, Nov. 29, 97)

Though she was also a mind-planner, Bing seemed to follow a longer process of thinking for outlining. If she did not succeed at once, she would keep on thinking; sometimes she had to make several attempts. Bing gave this very vivid description during one interview.

> J: Before your writing do you do some planning?
> B: Actually before writing my paper I did like thinking. Take some day only to think how to organize the paper, like the outline of the paper, and then I will write down the contents like one, two, different sections.
> J: Yeah, that's an outline.
> B: For subject. Afterwards I will fill in some contents.
> J: When you do that outline, do you do it mentally or what?
> B: Mentally.
> J: You don't put it on paper or make some notes.
> B: Like the final [paper]. Like I take some days only think. During maybe lunch time or before sleep, I just working somewhere I can think and think about that. And then if I don't know how to do it, I just stop thinking. I will continue sometime if I want. Afterwards, I will write, use the computer most of the time.
> J: So you do an outline. Do you write on the computer right away?
> B: No, remember the outline in my mind, then when I have time, I write.
> B: Because I take some days thinking about the outline, then remember the detail.
> J: Don't you forget if you don't write down?
> B: Actually I remember. I just keep adding some new things in my mind.
> (Interview with Bing, Dec. 8, 97)

In fact, Bing was a great "thinker." Not only did she think of how to organize the paper before writing it, she also had an extraordinary memory. She was able to virtually hold the outline in her mind until she had a more complete plan ready.

Hang was a paper-planner. Before composing the paper, he would produce an outline on paper and seek the approval of the instructor:

> H: Generally speaking, when I write, I write an outline first. If he didn't prove [approve], I should check it.
> J: So you first do an outline and get approval.
> H: Everybody should do; otherwise I cannot get a good grade.
> (Interview with Hang, Dec. 15, 97)

It seemed that Hang wrote and printed his outline in order to let the instructor review it, and almost always, make some suggestions. Thus sometimes he had to write multiple drafts of the outline until the instructor granted him the "go-ahead." This way, Hang was able to write "correctly" and secure a better grade than if he did not seek the instructor's prior approval.

Ling was like Hang. She wrote her outline on paper because she had to discuss it with her supervisor. Should that necessity be removed, she would become a mind-planner, as she admitted.

> J: Do you put it down on paper?
> L: On paper. Sometimes we have to discuss with the supervisor about the outline.
> J: Right.
> L: But not every time. If my supervisor wants to discuss with me about the paper before I began to write, I will plan it out. If he didn't ask me to do so, maybe just in my mind, or just draft [the paper].
> (Interview with Ling, Nov. 23, 97)

Ning was a computer-planner. He would write an outline on the computer before composing the paper, perhaps because he normally collected "bricks" - pieces of information - from his readings and store them on the computer. So it was convenient for him to generate an outline right on the computer.

Ying was the only student in my study who did not typically write from a definite outline unless her instructor requested one. Several factors could be relevant. One is that taking five courses each term, she constantly struggled with an extremely heavy course load, which left her little time to work out a detailed outline. Furthermore, by the time of our last interview she had not had a chance to write a research proposal or a more elaborate research document than a course paper. However, as she admitted, she would write an outline if required to do so.

> J: How do you start writing your papers?
> Y: First, you read about the subject.
> J: Do you do some planning before you write?
> Y: Not a lot. The ideas come as you write your paper.
> J: So you don't do any outlining?
> Y: When it's required, I do.
> J: So if it's not required, you just go straight to write.
> Y: Right.
> J: Do you have some kind of outlining in your head?
> Y: In a very general sense. Then after you write something, you reorganize your ideas and everything.
> (Interview with Ying, Nov. 24, 97)

Given that Ying did have some general plan about what she was to write, she might be considered a *marginal planner* rather than a straight non-planner.

5.2.2 Initial-Writing Methods

As indicated earlier, *initial-writing methods* are those the students used to compose or try to compose the initial draft of an assignment in part or whole. In what follows I discuss some of the methods and related issues, in particular, those I perceive as significant to their writing process or worthy of examination in light of the research in second language writing.

5.2.2.1 Accommodating Faculty Expectations

When completing their assignments, all the students tried to meet the expectations of the instructors, whether they liked it or not. Unfortunately, not all the expectations were clear to the students. When this happened, Ning would seek out the faculty and then go to great lengths to accommodate them, as he reflected,

> N: And also, my [dissertation] proposal. Before the proposal, I asked different professors. I think I told you. What are their expectation? They say 'you write in detail. And we need some new idea.'
>
> ...
>
> J: Before you do the experiment, it's kind of hard to give the details. Right?
>
> N: Oh, proposal, [for] that one I read a lot. I spent a lot of time try to write as detail as possible. Very detailed. Every experiment, even temperature, everything is [as if] almost I have already done. And also you can use my proposal to do this as [an] experiment plan or menu.
>
> (Interview with Ning, Jan. 2, 98)

Typical of many Chinese students writing in English, Ning had not attended to details in some of his earlier assignments which were not highly valued. Now that he knew what was expected, his writing was better appreciated. But supplying the details for this research proposal took considerable pains.

Bing, however, was not satisfied with expectations as general as those mentioned above. Whenever possible, she would meet with the professor to obtain prior approval of her ideas or get some clues and suggestions. To her delight, she usually succeeded in getting what she wanted: "... usually I talk with the professor in detail. And I can get something from the talk" (Jan. 5, 98).

Ting's supervisor liked long papers, for that showed students had worked hard. So Ting produced a 50-page paper for his Directed Study, though that meant he had to include some superfluous content. Ming was careful to make his ideas as close as possible to those of his supervisor because "the supervisor is a boss" (Ming, Aug. 27, 97). Further, Ting and Ming normally tried hard to follow all the suggestions made by their supervisors and instructors in their drafts. Ting explained, "I take a course not only to learn something but also to earn credits. If I don't do as he said, he might give me a low mark. He may even fail me. That would be very face-losing" (Aug. 29, 97). Often, the faculty were "right" by North American standards in their suggestions. For example, when researchers write papers in China, they are very straightforward in presenting their ideas. But in Canada authors usually have to take special care to provide rationales and specific information as well as following prescribed formats. So the Chinese students had to learn to write like Canadians. The faculty feedback was mostly fair and helpful. But sometimes even though they did not like the supervisors' ideas, as in the case of Ting's Directed Study paper (see 5.1.1), the students still accommodated their supervisors.

5.2.2.2 Completing Academic Writing vs. General Writing

One kind of routine academic assignment was the laboratory report or experiment-based research paper. Such papers usually follow a set format that includes abstract, introduction, literature review, methodology, results and discussion, conclusion, and references. Unlike students who usually followed the order of introduction, development, and conclusion when undertaking general writing such as creative writing (e.g., Emig, 1971; Lay, 1982; Zamel, 1982, 1983), the Chinese students often did not follow the order as stated above which appeared in their final product of the research paper. They might start with methodology, literature review, or conclusion or any part they preferred for a given paper. As Ling said,

> Usually for our papers, usually include abstract, introduction, methodology, result and discussion, conclusion, and reference. Usually I do methodology first, then result and discussion, and then introduction... (Nov. 23, 97)

Also, against the belief of some writing theorists (e.g., Cumming, 1989; Raimes, 1985; Zamel, 1982) that writing is thinking, the participants often had completed much of their thinking during experiments before they actually set out to write the laboratory reports. Such thinking might include part of the introduction and discussion, most of the methodology and results, and even part of the conclusion. For these parts, all the students needed to do after the experiment was to record, often mechanically, those thoughts and procedures in words.

In fact, Ting had done so much scientific writing in his studies at UBC that he suspected his general English proficiency was declining because he had no chance to practice it. Thus, just as Silva (1993) pointed out that writing in English by ESL students is different from writing in English by native English speakers, so writing research papers such as those based on experiments is in many respects different from general writing such as creative writing based on personal opinions and experiences. The difference suggests that *an ESL student who performs the former at a given level may perform the latter at a different level.* This finding is in keeping with Carrell and Connor's (1991) observation that "writing a 'good' personal essay does not necessarily translate into writing good academic prose" (p. 315).

5.2.2.3 Copying and Modified Copying

Copying here simply means taking sentences exactly from an assigned reading or another source and using them in one's own writing without providing quotation marks or the source of the reference. Though the concept can apply to one sentence, it more typically suggests a block of text of two or more sentences. Copying becomes modified copying if the source sentence is changed. Some researchers (Howard, 1993, 1995; Hull & Rose, 1989) have used the term *patchwriting* to refer to "copying from a source text and then deleting some words, altering grammatical structures, or plugging in one-for-one synonym substitutes" (Howard, 1993, p. 233). Patchwriting typically applies to writing a block of text and has been traditionally classified as plagiarism (Howard, 1995). In order to avoid the historical implications involved and facilitate my further discussions, I prefer the term modified copying, which is flexible in reference to any length of text thus copied.

Among my student participants, two said they sometimes copied when writing term papers but several others indicated their typical method of writing assignments as modified copying: they knew very well that copying, which was regarded as plagiarism in North America, was prohibited in academic writing. I explore below why and how they used these methods, and in the meantime consider some of the issues involved.

Kang sometimes copied when writing term papers. He did so because he believed it was common practice in his department among international students. But he did not copy a whole source article to produce his own assignment. He used multiple sources from the Internet and printed materials (see Appendix K for a sample of supposed copying). While on line, he cut/copied and pasted the parts into a file, mixed them up, and then smoothed out the connections. Consider this interview excerpt:

> K: The students, foreign students, our focus on one or two papers, and sometimes I just, not writing, I have to say it's a kind of copy. Just copy paragraph and paragraph on my term paper or project.
> J: Do you think the professor will know this is something you copied from others?
> K: That depends on your skills.
> J: Do you make any changes or just copy word for word without any change?
> K: Sometimes just word by word.
> J: When you copy word by word, do you use quotations?
> K: No, copy.
> J: So as if it's your own writing.
> K: Yeah, just organize them and let them smooth. OK. Just mix the several papers.
> J: Ok, you copy some sentences here, some sentences there.
> K: Yeah, that's right. And all those [students do this].
> (Interview with Kang, Nov. 22, 97)

Qing, who was in the same department, confirmed what Kang referred to as a common practice. She, too, admitted copying sentences when writing term papers, but she also rewrote sentences while retaining the content. She did so because her course paper would only be read by the course instructor, who I would assume would accept her paper without questioning. She was quite aware that copying in her thesis, a public document to be housed in the library, could bring her trouble or at least make her look bad.

> Q: When I begin to write something, I seldom write myself. Always find some articles, copy this part and this part, and then organize. Most of them [other students] do this way, I think.
> J: Do you copy sentence by sentence, word for word? Or do you copy it but then you process it, using the information when you use your language?
> Q: Just part of them.
> J: Without any change.
> Q: Seldom without change.
> ...
> Q: Yeah, I guess maybe this is for the...for some thesis you should quote some result of others. But for my topic, most of them are in some particular area. Actually the teacher is not very strict with some literature because every student is asked to do the same thing.
> (Interview with Qing, Nov. 20, 97)

Some professors in Kang's and Qing's department, cognizant of this practice, took measures to try to prevent or discourage copying. Kang said some professors had asked the students to hand in photocopies of the references listed at the end of the paper. But obviously, if a student did not list the reference, s/he might not have to hand it in.

Copying the source language may not necessarily indicate a lack of one's own ideas. Ling, for example, regarded copying as a learning method. When she had difficulty expressing herself, she would look for an article and try to *learn from* it, as she observed,

> Now every time I write a paper, I have to read many related papers and try to find their structure and use their structure. For example, I said I have some problem to conclude this paragraph. I will try to learn from someone else. They use this sentence to conclude. So I will use this sentence to conclude.
> (Ling, Nov. 8, 97)

To Ling, borrowing others' sentences on certain occasions to express oneself was merely a way of learning to write - to write like a published academic professional.

A more common practice among the student participants was modified copying. This seemed to result naturally from taking notes while they read source materials. In fact, Ning used a metaphor to describe how he made use of source texts. He compared writing an assignment to building a house. Gathering excerpts from the readings was collecting bricks. The bricks were ideas from the readings or his own ideas which could be expressed using the words he collected from his readings. Ning knew that when he copied exact sentences from source readings, he had to use quotes in his writing. But he did not want to use quotes since that way, his writing would appear to be full of quotes. He did not want to be accused of plagiarism, either, which to him (and several other students) meant only using the exact sentences from reading sources without acknowledgement. So he changed some words while or after taking notes. Once all the bricks had been collected, he would build a house, namely write his paper (see Appendix L for a sample excerpt, supposedly an outcome of collecting bricks). Ning had to use expressions from his readings because to him that was the only way he could ensure his language was correct.

> ...those things [copied sentences from readings with or without change] is like bricks. You use bricks to build the house. I have to collect all the bricks there in the place, in the address of the house. OK. When everything is almost done, I build a house in the same place. (Ning, Dec. 5, 97)
>
> Usually I took sentence from literature. I didn't use my writing; just organize different writing from literature. But I don't copy whole paper. I use different information in one paragraph. So just collect information. I don't need to spend my time thinking [about] the sentence or something like that. OK. Different way of writing. First I put important thing to me in the computer. I saw this paper, type in. When I type in, same time I make change. Sometimes I type in, then make changes as my information data base. When I make all the information here, I organize them, put them together. This way [I] make sure my writing is correct. (Ning, Dec. 5, 97)

Ning's approach to writing through modified copying is very similar to how Kang utilized copying mentioned above. On the other hand, Ning saw no way to avoid using references in terms of either content or language when writing scientific papers. He had to use others' ideas. Even the ideas he developed himself were based on the ideas from his readings. Strictly speaking, many, or perhaps most of his ideas were not entirely his own. But the question for us to ask is: Should he provide references for ALL those ideas? Indeed, is it possible for him to provide the references for ALL those ideas, some of which he might have learned in Chinese earlier in his life? This begs the more general but fundamental question: Should we acknowledge all our learning in our writing?

To express his own ideas, Ning had to use the English he learned from his readings. He could not normally invent English words, and certainly, could not normally use Chinese in his assignments. As he argued in one interview,

> N: You write the scientific paper. Everything you say, you have to use reference [meaning others' ideas]. *If you say, this thing, or protein, will be nurtured by 70 degree, this* experiment not done by myself.
> J: So you have to refer to somebody.
> N: You have to refer to somebody. That's the brick of your paper. But when you use this bricks through [to express] your own idea, what you want to say, so the difference - you have your idea, you use different bricks [others' language], build up your own thing. So you can write without reference [other's ideas]. But you use reference [others' language].
> (Interview with Ning, Dec. 5, 97)

So *reference* to Ning refers to others' ideas or others' language. In other words, when he wrote in English, he had to use references, one way or another, almost all the time because English was not his first language but one which he had just learned, and was still learning, from others.

Nonetheless, modified copying was not always easy. Ning met another challenge when he tried to change words in the copied sentences. Those sentences to him were "perfect." With changes, the sentences might not be "perfect" any more. So when I met him for the final interview, he was still learning how to make changes so as not to be accused of plagiarism.

With regard to Ning, further questions need to be asked. If Ning did not borrow others' words, which he thought would allow him to write "correctly," how could he write using his own Chinese or his imperfect English? Could he create good English writing given his current developing stage of learning English and learning to write in English? If so, would or should he be punished for using "Chinese English" (i.e., literal translation from Chinese) and having other language imperfections? While clearly Ning could be blamed somehow for his imperfect English or inability to write correctly and well on his own, I would presume that UBC as his educational institution bears some responsibility as well. As Hughes (1999) observes, "institutions are failing to prepare students for scholarly research and then punishing them for their confusion about the process of scholarship" (p. 1). The institutional responsibility, however, can be fulfilled through the offer of accessible English language courses designed for ESL graduate students, which are currently absent in the regular curriculum at UBC.

A less obvious form of copying is writing from memory or using words and sentences one has memorized from other sources. Since the students simply used the language they had *learned* by heart, usually they did not provide the reference; indeed, often they would not bother to memorize the sources along with the source language. Most students who have gone through the Chinese education system were used to such memorization as a way of learning right from kindergarten. In fact, at least two students in my study, Ding and Bing, were still practicing this method. Ding reflected on one method he used: "I always try to memorize all of them, sometimes words, sometimes if I think this sentence is important, I try to memorize it" (Dec. 15, 97). To his advantage, Ding had a good memory. But to his disadvantage, his memory subjected him to what he knew as plagiarism. Therefore, he had to deliberately avoid consulting the sources again while writing so as to minimize the chances of plagiarism. Still, if Ding used those memorized sentences in his assignment without providing the source, he might still be accused of plagiarism. But what then is the difference between language learning, especially rote language learning (still widely practiced in many parts of the world), and plagiarism? I know of no definite answer, but what I find illuminating is Pennycook's (1996b) conclusion to his thought-provoking article on borrowing others' words:

> All language learning is to some extent a process of borrowing others' words and we need to be flexible, not dogmatic, about where we draw boundaries between acceptable or unacceptable textual borrowings. (p. 227)

5.2.2.4 Thinking Media

As they planned, outlined, or organized the paper, most of the students thought in Chinese most of the time. One reason was that they were focusing on ideas rather than language and their ideas, including the organization of the ideas, were in Chinese. Consider what Feng, Qing, and Ping had to say:

> J: In your planning, do you think of the ideas in English or Chinese?
> F: Ideas in Chinese.
> (Interview with Feng, Nov. 19, 97)
>
> J: But for what purposes and in what situations do you think in Chinese?
> Q: Maybe some, for some logical problems. Before you write, you think what you should talk about each question. Right? Maybe in this case.
> J: You mean procedural?
> Q: Just basic procedures.
> (Interview with Qing, Dec. 30, 97)
>
> J: But you said sometimes you still think in Chinese.
> P: Yeah.
> J: At what stage, in what ways, for what purposes?
> P: Mainly the whole construction -
> J: - the outline.
> P: Yeah because when I planning, naturally I want to think in Chinese.
> (Interview with Ping, Nov. 29, 97)

It was natural for Ping to plan the paper in Chinese because he had developed the habit of thinking of the organization of his research papers in Chinese, at least up to the time of the interview. In fact, like almost all the others, he had been thinking in Chinese throughout his life. It was very difficult, if not impossible, to switch to another language to think, especially when his stay in Canada had not been significantly long and the subject matter was in the same area as his university studies in China.

Closely connected with the previous reason was the *effect* of the habit. The well-established habit of thinking in Chinese enabled the students to think quickly and reliably, as it seemed to them; thinking in English was simply unreliable for them at this stage. Wang explained:

> J: Why do you use Chinese in the planning stage?
> W: It is more convenient, more reliable, more clearly. You can organize your ideas more efficiently, more quickly. After that in composing you have to use English.
> J: Otherwise you can't write idiomatic English.
> (Interview with Wang, Dec. 6, 97)

Ding was more conscious that thinking in Chinese could lead him to produce non-idiomatic English. But for the purpose of an outline, he considered thinking in Chinese a "safe" practice.

> J: In what language do you normally think about your writing?
> D: When I write, I usually do an outline. Usually for the outline I think in Chinese. But when I do the writing I try to think in English.
> J: Why use Chinese for the outline?
> D: I think it's pretty easy, because I always think that's for outline, just know the whole things. It doesn't matter. It won't affect your writing. It's easier and quickly to think about it.
> (Interview with Ding, Dec. 29, 97)

As indicated above, when the students actually composed their papers, some of them would think, or at least try to think, in English. They understood very well that thinking in English was essential for producing idiomatic English writing. Kang even forced himself to do so:

> I understand that if you think in Chinese but write in English, that's only the first stage of English study, English learning. If you want to improve your English, improve your English writing, you have to force you to think in English and write in English. Sometimes I force me to do it. (Kang, Nov. 22, 97)

Some students thought in English while writing the paper owing to the force of inertia. Having read many English references and probably thinking in English while reading, they would continue doing so when they tried to use the references, as Ding did.

> J: So why do you switch to English in actual writing the paper?
> D: I don't know because at the beginning when I first write a paper in English, I think for me it's difficult. So usually I read lots, lots of papers. So it's like a format. So when I write this, if I read many papers, it's like a format. When I think I'm going to write in this sentence, just English come first, not Chinese.
> J: Because you read the English references. It's natural to tend to think in English that way.
> (Interview with Ding, Dec. 29, 97)

This was more the case for Ying, who had been reading English sources in speech pathology and audiology at UBC and had no Chinese background at all in her current area. The same was true with Kang to a certain extent. Since he had shifted from studying nuclear physics in China to electric engineering at UBC, he learned many English terms for which he had no Chinese translation. Therefore he had to think in English, as he observied, "But now I would think in English because I don't know how to exactly translate those words into Chinese. That's the new academic term I just learned" (Nov. 22, 97).

Ping had a different reason for thinking in English during the writing process: he wanted to. Though his language proficiency was still limited, the composing process allowed him time to think of and express his ideas in English, albeit slowly. In speaking he might not have the needed time to do so; therefore he often had to translate Chinese to English during speaking or speak English in a Chinese way.

> J: But how come when you write you use more English?
> P: Because in writing the speed is certainly slower than in speaking. So I can control the speed and I will feel more comfortable to write in English. You see I have mentioned. Only I cannot express myself fluently in English, I will resort to Chinese. But in writing this situation is better. So I will more tend to think in English.
> (Interview with Ping, Nov. 29, 97)

Still, the students also thought in Chinese during the composition process, some more than others. From the interviews I identified the following reasons or situations for thinking in Chinese which applied to one or more of the students at one time or another.

Throughout their writing process Ming and Ting, for example, used Chinese extensively in thinking. Ming acknowledged doing so 50% of the time and Ting 70%. One reason was its relative ease though Ming condemned it as a bad habit. The most typical situation was to write assignments involving a considerable amount of mathematics or calculation (see Qi, 1998), which they had been learning and practicing in Chinese all their life. Ting also said he was often so pressed for time that he simply could not afford to think in English. A third reason related to their professors' expectations: in their department, many instructors did not care much about the students' language as long as the ideas were correct and understandable. Therefore, the students had no pressure to think in English, which was presumably more likely to generate English language with better rhetoric and idiomaticity. In fact, Ting suspected that his general English proficiency was getting worse because he had no chance to practice it, nor was he obliged to pay close attention to it in writing. The substantial use of Chinese in thinking may help explain why Ting complained that often his ideas were misinterpreted by the professors, or simply called unclear. English and Chinese are entirely different linguistic systems involving considerably different thought processes, different sentence structures, and many non-corresponding expressions (see Cadman, 1997; Fox, 1994; Silva, 1993; Shen, 1989). If Chinese sentences are translated literally into English or English is written in Chinese ways, the writing will very likely have problems (see Appendix M for a sample; for more details on the students' writing problems, see Chapter 6).

A further reason some students thought in Chinese was the difficult or complicated topic: it was simply not possible for them to process the information in English, at least initially. In this case, Hang would translate his Chinese thoughts into English:

> J: But do you find it hard to translate? The thing is if you think in Chinese, and you have to write in English, there must be a process of translation going on.
> H: Yeah. But if the topic is familiar, English and Chinese are the same. But if some topic is very difficult, maybe I think in Chinese.

(Interview with Hang, Dec. 15, 97)

Ting revealed yet another interesting point about thinking in Chinese. He defended his thinking in Chinese on the ground that he had acquired most of his knowledge, or intake (see Chaudron, 1985; Gass, 1988) of wood science in Chinese. Thus when he tried to use this knowledge base or retrieve information from it, he just resorted to Chinese. This is consistent with Frielander's (1990) notion that topic knowledge stored in a certain language seems best used when retrieved in the same language. I call it the *intake-retrieval phenomenon*. Ting explained in one interview,

> What does that depend on? If I received the information in Chinese, I am likely to revert to Chinese. But if I don't quite understand something in English, then...Let me give you an example. I specialize in wood science. If I take a wood science course, I always change to Chinese. But suppose I have a friend who does not specialize in wood science and who does not have a good understanding of my specialization. If I say a wood science term, he doesn't know its Chinese meaning. If you ask him, he can't tell you the Chinese meaning but may be able to explain it in English [provided that he has read the English text or dictionary]. His understanding then is very mechanical [repeating the book]. The same applies to me. If the information I receive in English is something I never learned before, I am very likely to think of it in English.
> (Interview with Ting, Aug. 29, 97)

Ting's friend who knew little about wood science but received input about it in English would be likely to store and retrieve that knowledge in the same language, namely, English, given that he already had a considerable mastery of English. This was the case for Ying. She was studying audiology and speech pathology, for which she had neither educational nor work background. All she read of her area was in English; consequently she thought in English.

> J: In what language do you normally think about your writing?
> Y: English.
> J: All the time from planning to proofreading?
> Y: Yeah.
> J: Why don't you use Chinese?
> Y: I don't know how Chinese...It's hard to translate and back. Just all the readings are English. All the terminology are English. I don't have a background in this area in Chinese.

> J: So you have no resource to go back to.
> Y: No.
> (Interview with Ying, Nov. 24, 97)

Rather than translating Chinese to English, Ding applied a different strategy. When he met complicated concepts, he would think in Chinese first, and then switch back to thinking in English to reprocess the thoughts. Thus, he had a better chance of not writing "Chinese English."

> J: Do you switch to Chinese in the middle of writing?
> D: Sometimes if I don't know. I'm not sure whether I can, how to express my ideas in English. So I just switch to Chinese, to think if in Chinese, what should I say.
> J: Do you think it helps?
> D: I think it helps.
> J: Do you do a kind of translation?
> D: But what I mean is if what I did is too complicated to use [my limited] English to express, so you use Chinese to think about. When you think it through, so you just use English to think this again.
> (Interview with Ding, Dec. 29, 97)

As Ding's story suggests, perhaps a more common phenomenon is that instead of thinking in English or Chinese entirely when writing a paper, most of the students would use both, but separately. The transition or switch from one language to another viewed from a psycholinguistic perspective is called language-switching (cf. Qi, 1998).[4] The students would switch from English to Chinese when they met conceptual difficulties or could not express their ideas in English during writing, and then either translate or switch back to English for thinking. Consider what Ling and Xing said:

> I try to think in English but sometimes it can't be avoided to think in Chinese. When I meet difficulty I think in Chinese. (Ling, Jan. 10, 98)

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[4] Sociolinguists have used the term *code-switching* mainly in the analysis of speech discourse to refer to the switch from one language or language variety to another during one communicative episode (see e.g., Beebe, 1977; Ellis, 1995; Heller, 1988; Meisel, 1994; Scotton & Urg, 1977). Milroy and Muysken (1995), for example, used code-switching to describe "the alternative use by bilinguals of two or more languages in the same conversation" (p. 7).

> I usually think in English. But sometimes I do it in Chinese especially if it is a difficult concept. (Xing, Nov. 18, 97)

Apparently, the students tried to think in English during writing. When they had to think in Chinese, they might then have to translate their Chinese thoughts to English. Ding's language-switching was not typical of other students who usually resorted to translation, as Wang did:

> W: Yes. For example, an English sentence, in a Chinese structure like an English sentence, just put English words into the sentence. Direct translation.
> J: Sometimes you do that?
> W: Yes. Sometimes you cannot find a proper expression in English, you have to translate them from Chinese. But afterwards, you read papers on this topic, just similar to what you want to say. Then you find it in English.
> J: Chinese translation is different. The point is translation is a strategy you have to fall back on. You have no resort, absolutely no expression. Obviously you have to fall back on something because you have to get on, get ahead. You cannot stop there, get stuck. Translation is a backup strategy to help you out.
> W: Yeah.
> (Interview with Wang, Dec. 5, 97)

My response in the interview did not suggest that students should use translation as much as possible, but that it serves as a remedy or strategy to get the writing started. Of course, translation has its drawbacks as it often results in "Chinese English," or fails to express desired ideas and effects accurately. Indeed, Ling complained about the use of translation:

> I'm sure my native language interferes. Sometimes I want to...I don't know how to express my ideas clearly. But I have some Chinese words in my mind, but I got to translate into English. But translate doesn't exactly express my idea. So I'm not so happy when I translate [into] English. But I can't find the words within my range of vocabulary.
> (Ling, Interview, Jan. 10, 98)

When the students met difficulties expressing their ideas in English, some would turn to Chinese-English dictionaries. But these dictionaries have only limited use in that they provide only literal translation of Chinese terms. The students had to turn to English-English or English-Chinese dictionaries to seek explanations of the meanings and uses of the words. Ping explained:

> J: What do you do in such a case?
> P: I have to look up in a Chinese-English dictionary. After that, I again use English dictionary, to make sure. Sometimes, the Chinese-English dictionary cannot give you accurate explanation.
> J: They just give you the translation, but not how to use the word. You have to go to the English dictionary to look for the meaning and explanation.
> P: I do it this way.
> (Interview with Ping, Feb. 9, 98)

Some students would use Chinese-English dictionaries just to get the spelling of a word, especially of technical terms which are hard to spell. But if a student could spell the word, the English dictionary might be of no use, as happened to Ling.

> Sure. Sometimes Chinese-English dictionary. Because only in the dictionary can you find the spelling, such as 'promising.' If I can't remember how to spell it, I go to that dictionary and find the English word in translation. If I don't know how to spell a word, it will be difficult for me to find it in an English dictionary. (Ling, Nov. 23, 97)

No one thought in English or Chinese all the time; there is a continuum from thinking in Chinese to thinking in English, on which they took different points at a given time. As their English skills developed, they would move from one end of the continuum toward the other. Consider Kang's generalization and my conversation with Ping:

> I think everybody, I mean for every Chinese, if he is born in Chinese [China] and studied English in a Chinese environment, the simple procedure he has to go. First, he read English but think in Chinese and translate sentence by sentence; and keep on going, he'll try to think in English. Right now, like you, you can speak English. Most of the time you can think in English. But only depends how far to this extent. (Kang, Nov. 22, 97)
>
> J: In what language do you normally think about your writing?
> P: I think gradually at least in my writing I tend to think in English.
> J: I see. You tend to, or you are starting to think more in English than in Chinese.
> P: Yeah. Starting to think more in English when writing.
> (Interview with Ping, Nov. 29, 97)

The difference, however, is that some students such as Ying, Kang, Ping, and Zong would probably move faster on the continuum because they had a better mastery of English, thought more in English when reading English, had less interference from their studies in China, and/or tried harder to think in English while writing in English. Others, such as Hang, Bing, and Ting, would probably move more slowly because they had lower English proficiency, suffered more from the Chinese influence, and/or relied more on translation.

5.2.3 Post-Writing Methods

To analyze the Chinese students' writing process, I use the term *post-writing* methods for those methods the students used to proofread, revise, or edit the initial draft of a paragraph segment, a paragraph, a section of a paper, or a whole paper. Post-writing normally occurs after the completion of the initial draft.

Ding performed post-writing after drafting a paragraph. But once the whole paper was completed, he would not normally proofread it. Ling proofread after drafting one part or section of a paper, sometimes one or more days later. Then she would discover some of her own errors in the first draft or find new ideas to add; or she might be surprised that she was able to write better sentences than she expected. Ling had used this method in her Chinese writing in China. Her practice at UBC could be regarded as a transfer:

> J: Do you use editing and revision in your writing? If so, how and at what stages?
> L: I do this.
> J: Do you do it while you write or after you finish the first draft?
> L: After I finish one part [section], like methodology. After I finish this part, I will review.
> J: Like I finished this part today, come back to it tomorrow or another day?
> L: Yeah, it's quite helpful.
> J: Do you do that?
> L: Yes, sometimes. I find it's helpful. Sometimes one day or one week passed. When you go back to your writing, you will find many mistakes, or you will have new ideas to add.
> J: I recommend this strategy as I found it very helpful.
> L: Sometimes I find, OK, I'm very surprised I can so good sentence when I come back. Even in China when I write Chinese article, I write this way.
> (Interview with Ling, Nov. 23, 97)

The rationale for such *postponed post-writing* is that one is likely to approach the draft with a fresh mind on another day and thus be able to have better ideas for the language and/or content of the initial writing.

A related consideration might be that during initial drafting the students were preoccupied with their ideas. Only during the post-writing stage could they pay more attention to expressing their ideas. Therefore, for Zong editing constituted an essential stage of writing:

> Z: The other thing to improve writing is to read after you put something down. You read through it and find this sounds funny. It doesn't read well, it doesn't sound well.
> J: You mean proofreading or editing skills.
> Z: Yeah, editing skills. You always go through different stages of editing [writing]. First you put ideas down. Then you make it more readable. It's not just logic, it doesn't flow very well.
> J: The feel for the language.
> Z: That also comes from the speaking part. When you read you listen to yourself at the same time.
> (Interview with Zong, April 8, 98)

Similar to, but somewhat different from, Ding and Ling discussed above, Wang would review a draft after he finished addressing a topic in one or more sections. The transition between topics provided him a convenient break to edit one topic before taking up another. But if the paper contained only one topic presented in a few pages, he might not need a break.

Hang and Qing normally did their editing right after drafting the whole paper, and seldom visited the writing again, unless the instructor requested a revision. The practice of "what is done is done" was actually true for most students, the possible exceptions being Ling and Zong. But when writing a thesis, a dissertation, or a journal submission, they would be more serious and careful.

Unlike most of the others, Ying would normally edit her writing as she composed. Perhaps since she had majored in English as an undergraduate, she paid much attention to her language as well as to her ideas while she wrote. In fact, she always aimed at a clear logical organization of her thoughts expressed in a flowing style. But like most others, she normally would not undertake postponed post-writing:

> J: Do you use editing and revision in your writing? If so, how and at what stages?
> Y: Sure.
> J: How do you do this?
> Y: One thing is the organization of your thoughts. And the other thing is the general flow of your language. So you need to modify that a lot –
> J: - I see, as you write.
> Y: Yes.
> J: You do proofreading, I guess. Do you proofread or edit another day?
> Y: Normally I don't.
> J: So once it's done, it's done. Maybe you don't have time. -
> Y: Yeah, it's not a short process. It's not it's done. But you spent so much time while doing it.
> (Interview with Ying, Nov. 24, 97)

Though most students performed post-writing after or during drafting, only perhaps Ying and Zong paid special attention to the flow of the language, or rhetoric. English writing proficiency certainly was relevant, as Ming admitted,

> We don't care about style or strategy. As long as we can turn out the paper, we are satisfied. Attention to style is too difficult for us including those who have graduated with theses in our dept. The concept of style perhaps applies to you language majors. But to us it is too early to think about it. If we can write something that the prof can understand, that is already an accomplishment for us. We can't afford to care about styles.
> (Ming, Aug. 27, 97)

The students' and the professors' attitude to writing was another factor. As presented in section 5.1 and 5.2.2, most faculty in sciences and engineering were more concerned about ideas than about language. This created an impression among the students that language was not very important as long as it was understandable and that the experiment findings were correct or valuable. Further, Ming believed that the straightforward nature of scientific writing did not require much rhetoric. It is not surprising then that Feng rarely revised course assignments in order to improve the language, though he would treat a journal submission differently.

In short, most of the Chinese students would proofread, edit, or revise their initial drafts before submitting them to the course instructors. Some, such as Ling and Zong, were more serious and spent more time revising the language as well as the content. Their attitude toward post-writing had much to do with the expectations of their course instructors or supervisors: Ling's supervisor had high expectations and spent much time of his own to revise her drafts. But Feng's supervisor did not appear to be demanding about formal aspects, so Feng seldom proofread his assignment drafts for formal improvements. Though the students paid attention to grammar and spelling during post-writing, most of them did not seem to have a strong sense of the flow of language, or rhetoric. Some, such as Ding, Ling, and Bing, sometimes asked their supervisors to perform post-writing for them. Only Hang and Ning mentioned having peers read their drafts on certain occasions. Since faculty were generally very busy, the students assumed that seeking peer assistance with post-writing, especially from strong native-English-speaking writers, would improve their final products.

5.3 Summary

In this chapter I have addressed the kinds of assignments and research proposals the Chinese student participants had to complete for their course work and theses or dissertations. The most common and most weighted assignment was the project report, much like the scientific article in academic journals in style. However, the specific requirements for project reports and proposals varied from one faculty member to another. Similarly, faculty members differed considerably in their expectations of the students and in how they reacted to the students' papers. Some professors provided very detailed feedback and even rewrites while others did not even return the students' papers. In general, the Chinese students preferred to receive faculty feedback regarding both the form and the content of their writings rather than content alone. They were often disappointed when the faculty failed to get their papers back to them or failed to provide feedback that would help them improve their writing.

Further, using my data, I have explored the methods the Chinese students used at the pre-writing, initial-writing, and post-writing stages, and have discussed relevant issues related to the methods. Among others, the following methods or issues are worth reiteration:

1. All the participants were aware of what plagiarism meant and its consequences. However, because they were not confident of their English and were pressed for time, most had to copy from sources, in varying amounts and with varying frequencies. Partly to avoid being accused of plagiarism, they sometimes utilized modified copying by making changes to the source language. One fairly common approach to writing assignments such as literature reviews seemed to be to combine borrowings from different sources and then reorganize them. While most faculty may disapprove of word-for-word copying of one or more source sentences without providing the references, modified copying by international students appeared to be acceptable.
2. Since learning a second language or learning to write in a second language inevitably involves imitation, it is not always easy to distinguish learning from imitation, learning from copying, imitation from plagiarism, or learning from plagiarism (including modified plagiarism). Certainly, more research needs to be carried out in this direction.
3. In planning or outlining papers, most students used Chinese as the thinking medium, because their background knowledge was largely stored in Chinese, and it would be much easier to access the knowledge bank in the same language. Hence, I proposed the *intake-retrieval phenomenon* (for information processing through language) which can be elaborated as follows: when one learns something for the first time in a particular language and stores the learning in that language, one tends to retrieve or think of the learning in the same language afterwards.

4. Some difference existed between first- and second-hand information processing. When some students wrote reports on experiments they had conducted, they experienced first-hand information processing, which more likely involved more thinking in Chinese and possibly translation afterwards. When they only reported on the work done by others such as in a literature review or explained a concept learned from an English source, they usually experienced second-hand information processing, which more likely involved more thinking in English.

5. Even if the students tried to comprehend English sources in English, most of them would resort to translation to Chinese to understand difficult concepts. Some had to translate the concepts to Chinese in order to store them in long-term memory as they had acquired their previous knowledge background in Chinese. If they tried to store new concepts in English, the concepts would not integrate with the Chinese concepts. Similarly, most had to switch to Chinese when thinking about difficult complicated concepts during writing.

6. There was a long continuum from thinking completely in Chinese to thinking completely in English. The students developed along the continuum though some moved faster than others.

7. Unlike composition where writing is believed to be thinking, laboratory report writing might simply involve mechanically recording what has transpired and therefore would not involve as much thinking. Thus, that a student could write well in scientific English might not necessarily mean that s/he could write equally well in general English, and vice versa.

8. Finally, since their own research was supposed to be original, the students had to rely more on themselves than their readings to report and discuss their research findings. As Feng and Ming admitted, it was the discussion part of the research paper that presented the most challenge. To further describe the' writing challenges, I turn to the next chapter.

CHAPTER 6: ANALYSIS: WRITING CHALLENGES

In this chapter I present the challenges the Chinese students encountered in the process of completing their written course assignments and thesis proposals. Most of these were the difficulties the students reported in our interviews. Others were suggested by the problems I found in the students' sample writings and then discussed in interviews. For the sake of presentation I divide these challenges into four categories: 1) vocabulary and grammar, 2) stylistic concerns, 3) thought transcription (or expressing ideas in writing), and 4) information management and organization. The categories might not be mutually exclusive: though I choose to discuss a certain example under one category, it might also fit under another. Then, based on my data, I offer explanations for the challenges under discussion from cross-linguistic and cross-socio-cultural perspectives.

6.1 Vocabulary and Grammar

Among the many language difficulties the students initially encountered in their studies at UBC were technical terms. Since they had studied their subjects in China mainly in Chinese, many English technical terms were new to them. They could not spell the terms, know their meanings, or identify their sound representations even though the terms were in their own fields. This difficulty was more serious for students in chemistry, medicine, and biology, which seemed to be full of technical terms and expressions. The technical terms added to the students' existing language difficulty, especially in the beginning. As Ling recalled,

> I remember the first day when my supervisor talked to me, he talked about copper sulphate, 'liusuantong' (in Chinese). It's really a common chemical in China. Even you just have very simple chemistry education, you will know this. But for me I cannot understand. I don't know the language. My supervisor talked about copper sulphate. I don't know

> what he was talking about. But he write down on the blackboard, I know it's 'liusuantong.' So in chemistry there are many, many new words. Every chemical is a new word for me. (Nov. 8, 97)

Other students also complained about technical terms. In writing, if they were thinking in Chinese and did not know the English terms, they would have to consult a Chinese-English dictionary. But unfortunately, many of these terms and expressions could not be found in their dictionaries, so they had to revisit the books and journal articles for help.

As suggested above, these students had difficulties with technical terms mainly because they had little English material to read in their fields in China. Their textbooks were almost always in Chinese and English journal articles were scarce. In contrast, university students in Taiwan were much better off; their readings were mainly in English. Wang revealed some of the root causes.

> W: Another example, we have more difficulties than Taiwan people. I ask them. They say that they use original textbooks in English especially in science and engineering. But in China we translate them all into Chinese. So they have no difficulties to grasp the concept, the terms used in engineering or sciences. But when they take lectures they speak Chinese. The readings is English.
> J: Maybe their instructors got their education in the States.
> W: I'm not sure. Besides, there's very few textbooks in Chinese on science and engineering. Most of them are directly imported from the US.
> J: Only a small number in Chinese. The majority are in English. In China it's the opposite.
> W: [In China] Everything they translate into Chinese.
> J: It must have to do with the professors. Their English is not very good. Also the culture is suspicious of the foreign.
> (Interview with Wang, Dec. 5, 97)

As suggested elsewhere in this dissertation, even today many of those in power in China are still bent on trying to prevent students from "spiritual contamination," which often refers to the influence of Western culture such as critical thinking.

Another difficulty that Kang and Xing mentioned was using varied vocabulary. When Kang wrote English papers, he found himself using a limited number of words again and again.

He simply did not have the resources to use more varied vocabulary. He felt a similar paucity with sentence structures:

> K: You'll find you use some words quite often. It means you have a very poor vocabulary.
> J: Limited vocabulary.
> K: I think it always happens to Chinese students.
> J: What?
> K: The limited vocabulary in the writing sentence.
> J: Right.
> K: Or even the sentence organization [structure]. Always like use two or three or some type of sentence.
> (Interview with Kang, Nov. 22, 97)

One reason for the limited variety of words could be a difference between English and Chinese: English has an unusually large vocabulary including rich synonyms expressing different shades of meaning. Chinese, however, has a relatively small number of characters and readers depend largely on context for sense-making and interpretation.[5] If the students think in Chinese, even partially, when writing in English, they tend to use a very limited number of corresponding English words and expressions, especially if they do not have a large English vocabulary.

The fact that Kang could not use more sentence structures does not mean that he did not know of other structures. After all, he scored 620 on the TOEFL. Instead, more likely, he was simply not used to using other structures. Ming, on the other hand, deliberately avoided using more complicated structures or those he was not very sure about because he feared making errors and being penalized for them.

Still, some students, especially Bing, Ming, and Ting, admitted to or showed many grammatical errors in their writing. Apparently, having a good knowledge of grammar and displaying it on the TOEFL test does not mean that one can use those structures well. There is a gap between "know-that" and "know-how." Ting was one such student:

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[5] This does not mean that English is a better language than Chinese. They are simply different in certain ways in certain contexts, and such differences may present challenges for Chinese speakers

> J: Aside from discussion, is there any other aspect that is challenging to you?
> T: Grammar. I have no big problem with tenses, but with prepositions, articles, sentence structures, and usage. I think the most challenging [of these] is structure. It's often confusing.
> J: It's no easy thing to produce good structures. That also requires rhetoric. Even though the grammar may be correct, the structure may not be beautiful.
> (Interview with Ting, Aug. 29, 97)

My analysis of the students' sample writings revealed more problems. For example, I read the Directed Study paper Ming wrote three months after his arrival in Canada and the grant proposal Ting wrote five months after his arrival. The common problems that both papers exhibited were improper use of punctuation (especially commas), subject-verb agreement, misuse of prepositions, non-idiomatic usage (e.g., *was got; as following*), and non-alphabetical listing of reference sources in the text. Ming's paper also showed misuse of upper case in headings (for function words), non-parallel structures, overuse of the passive, dangling modifiers, run-on sentences, and overly long sentences presumably due to translation. Ting failed to explain acronyms, left out "and" before the last listed item, overused colloquial expressions (e.g., *say*), and left an unusual number of typographic errors.

Some of the problems Ting exhibited suggested that he failed to proofread the last draft before submission. Indeed, he said that he did not like to reread what he had written. So, it appeared that even to bring himself to proofread proved a challenge.

One explanation for the numerous problems in the students' writings had to do with the faculty demands. While some faculty members were more strict with students' writings as demonstrated in their careful markings of grammatical and stylistic points, others showed more tolerance, which turned out to be an excuse, letting the students pay less attention to language.

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to learn English.

> My professor doesn't care much about rhetoric when I write scientific papers. He only cares if he can understand my ideas. [Language should be] simple and clear. He doesn't care much about grammar. (Ting, Interview, Aug. 29, 97)

In other words, as long as the writing was understandable, the faculty member would accept it even though grammatical and stylistic errors were abundant.

Another explanation was the refuge offered by student identity. As students, some felt that it excusable to produce imperfect writings, or make errors. If they assumed some executive position and therefore, critical responsibility, they would have to try to be faultless. For instance, Wang was pleased that as a student he felt a bit more free to make mistakes in contrast with his experience when working for a company in Singapore.

> W: ...But if you are a student, you can have more space to make mistakes. Your responsibility is less than if you were an engineer.
> J: It's OK for you to make mistakes.
> W: Yeah, because you are a student, you come to learn something.
> J: I see. It's natural to make mistakes as a student.
> W: As engineer it's your responsibility to make everything right.
> J: That's a matter of identity too.
> W: When you are an engineer and when you write a report, you must be very careful. Don't let your boss to pick any serious mistakes.
> J: I see, because you are in control, because in that position, that can have serious consequences. But as a student it doesn't matter that much.
> (Interview with Wang, Dec. 5, 97)

Finally, the students' challenges in vocabulary and grammar could be attributed to their lack of writing practice. Before coming to Canada, they had generally written very little in the form of essays or research papers in English. English for non-English-major university students in China is primarily orientated to exams which emphasize multiple-choice questions on grammar and reading comprehension (see White, 1998). Not surprisingly, completing course papers and thesis proposals would also pose challenges in other aspects of writing as I continue my examination below.

6.2 Style

In this section, I discuss the challenges the students had concerning style. I use the word style, or its derivative "stylistic," in a broad sense to include concerns about rhetoric (such as clarity, exactness, variety, and conciseness; see Hu, 1995) and format as well as other stylistic concerns (such as oral vs. written). While some students (such as Ting and Bing) highlighted more difficulty producing grammatically correct writing than others, almost all found writing with good rhetoric and appropriate style a challenge. In fact, some rhetorical and stylistic concerns were so challenging that a few students thought them to be beyond their reach. I examine these challenges in some detail with reference to the individual students.

Since Ying majored in English in China, she had no problem writing grammatically correct sentences. However, she perceived much difficulty in producing writing in what she called appropriate style.

> Style could be difficult. If you write in your native language, you know what language, what vocabulary, is appropriate, what kind of writing style to use, but I don't quite get the proper sense of how certain vocabulary is to be used [appropriately], how the sentence should be organized...[to achieve] the flow of thought. (Ying, Interview, Nov. 24, 97)

Zong, who had recently earned his Ph.D. in Wood Science at UBC, expressed a similar challenge even though he had published several articles in English journals since arriving in Canada. He explained the "flow" difficulty:

> Speaking of flow, I guess one of the hardest things about writing is to make it flow, make it readable. You can mechanically put what you want to express on paper, but it doesn't flow well. That tells the difference I think [between good writing and poor writing]...just flow. When you read, you grasp the meaning and you are eager to read.
> (Zong, Interview, April 8, 98)

For writing to flow, it must, at least, be clear, coherent, and smooth in both language and meaning.

Ping expressed difficulty in style too. But his understanding of style was a little different, more about idiomatic expressions, or writing in pure English rather than Chinese English.

> J: You mentioned style is hard. Why?
> P: You see, for vocabulary, I may know the meaning. In writing you do not know which words should go with others. Maybe you can write with correct grammar. Maybe it appears to native English speaker - it's not English.
> J: So you can write, but you are not sure whether it's acceptable or not.
> P: No, I'm not sure.
> (Interview with Ping, Feb. 5, 98)

Thus Ping pointed out one challenge common to many ESL writers, especially those who have had little exposure to the target language. Even for more advanced ESL writers, writing in idiomatic English may still pose a considerable challenge.

Another difficulty for several students was using the written academic style. Probably because they were not aware of this stylistic concern, or the difference between the oral and written styles, some of the students used various colloquial expressions in their writing, the most common being contracted forms involving auxiliary verbs (such as *there're*, *I've*, *it's*, and *wasn't*). For example, Qing admitted this difficulty after I reviewed my feedback on one of her papers with her:

> J: What other linguistic difficulties?
> Q: Sometimes you can't maybe make the difference of the oral expression and writing [written] expression.
> (Interview with Qing, Dec. 30, 97)

Perhaps more challenging than the written style perhaps was to write with clarity of meaning. Misuse of words, non-idiomatic expressions, inappropriate placement of sentence elements, the misuse of sentence connectives (to express logical relationships), and the juxtaposition of incoherent ideas can all make a sentence unclear. For instance, Ting admitted his writing often lacked coherence and that his sentence structures were sometimes confusing. In fact, all the students had some difficulty with clarity. No wonder Ming remarked that they would be satisfied as long as they could express their ideas and their instructors could understand them, suggesting rhetoric and other higher-order writing qualities (such as style appropriateness) were somewhat beyond their reach at this stage. But did the instructors have any problem understanding the students' writing? In other words, could the students clearly express what they intended to convey? One professor in electrical engineering had to ask a student to write eight or nine drafts of a paper because the first few drafts had many problems, including clarity. As I reviewed some of the students' writing samples, I, too, often noticed places where meaning was unclear.

Another stylistic challenge concerned the use of references. Some students were not used to providing the references when they quoted sources directly or indirectly. Ding, for example, recollected:

> I think when I first came here, it's about reference. I usually don't want to give too much reference. Reference, is boring to type reference and easy to type wrong. But their request is so strict. As long as every sentence has reference, you have to give it. (Dec. 29, 97)

This had to do with the cultural differences in academic or research writing between Canada and China, as Hang described:

> H:...But western journals give more space to discussion and rationale, like how much past research has done.
> J: Acknowledging prior research.
> H: Previous research, in the introduction. You can spend one page on it. In China you only need a line or two. If more, the editor would ask you to delete it because it takes too much print space. Other issues like format and quoting are different too. But in China not so strict. However, China is starting to make these requirements.
> (Interview with Hang, Nov. 25, 97)

While a comprehensive review of past research and a well-developed rationale for proposing new research are regarded as essential parts of a research paper in North America, doing so in the Chinese culture is often considered redundant and unworthy of the valuable space reserved for reporting research findings. Moreover, the number of Chinese books and academic journals for student use is very limited especially in advanced sciences and engineering. English materials with such contents are even more scarce. This scarcity of reference materials contributed to the habit the students had developed of not using many references. Though Ling could change the habit, as she showed in the following interview segment, others still found it difficult.

> L: At my stage I didn't use much reference. For my master's thesis [in China], maybe 20 references. But you know even for this directed study [project] I got 60.
> J: That means you had to read a lot more here in order to write a paper than in China. Was it because of the lack of references there?
> L: Maybe. In China we didn't use the English reference so much. But if you just use the Chinese reference, it's very limited.
> J: There were not many such publications.
> L: No.
> (Interview with Ling, Jan. 10, 98)

I see many reasons for the challenges the students had related to style. One is the differences between English and Chinese, especially variations in sentence structure. English allows for clause-imbedding and subordination often at multiple structural levels within one sentence, and the subordinate elements at initial, middle, or final position of the sentence depending on information or rhetorical considerations. This is especially true in academic and scientific writing. Chinese, on the other hand, usually does not seem to have such rich and complex sentence structures in scientific writing. Instead, simpler and shorter sentence structures seem to be typical. Another difference is that English has many connectives to express a whole range of logical relationships and their shades of meaning while such connectives in Chinese are far fewer.[6] My interview with Hang further elaborates these differences:

> H: [Linguistic] Conflicts? I think it's the coherence between paragraphs and arguments. I feel that from my own writing experience. That may have to do with our different cultures. Native English speaking writers are very logical. The following sentence comes from the previous one. Their arguments link one another. That's not easy for us to learn. When I read Chinese papers, I felt that discussion is very general, on the superficial level, logic is not very strong. But the NES writings are well connected. Every sentence has its place. Jumping doesn't happen often.
> J: You said the conflicts have to do with language. Do you mean that Chinese as a language is inherently not strong in connection?
> H: I guess it is possible. But if you write in English, it's easier. When I was translating a book for my supervisor, I found it easier to express some thoughts, by using clauses. If you do this in Chinese, the sentences would become too long. So you have to use short sentences. With short sentences it's naturally more difficult to handle connections or logic.
> J: Thank you. I felt this way too. English has complex sentences, compound sentences, relative clauses, which allow you to build many ideas into one sentence. But in Chinese, no. We seldom have very complicated sentences.
> (Interview with Hang, Nov. 25, 97)

These differences add to the difficulty for Chinese students to shift from the habit of writing simple short sentences to writing long complex ones, and to get used to using sentence connectives. In fact, since composing long complex sentences is likely to pose more risk of errors and lack of clarity, some students, like Ming, simply sought refuge in less complicated structures.

Another reason for the simple writing style of the Chinese students is the huge differences between the academic culture in China and that in Canada. As suggested above, academic writing in sciences and engineering in China tends to be straightforward, simple, and to the point. As the Chinese saying attests, you "open the door and see the mountain" (*kai men jian san*). But academic writing in Canada usually requires substantial supporting details, rationalization, and argumentation as well as prescribed formats. The following segments of interviews with Ting and Ling offer more explanations and comments:

> ...The time I have conflicts with them [the faculty] is when my paper is too simple. We do this all the time in China. Here your paper has to be logical. If you have an assumption,

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[6] See note 5 for an explanation.

> you need to give the rationale for it. Sometimes if I don't have the rationale, the teacher would like me to have one. I think this is the strictness of North America. I usually try hard to adapt. (Ting, Interview, Aug. 27, 97)

> L: Actually the homework is very simple [in China]. If you write the experiment report, it's quite simple. But here if you write an experiment report, you have to go through the whole thing - literature review, and methodology, everything, just like a paper. In China, no, OK. You just present the result, and answer some questions.
> J: You don't have to give background.
> L: Here it's more formal, elaborate.
> (Interview with Ling, Jan. 10, 98)

Added to the simple writing style is the Chinese tendency to write for the writer. This makes it harder to write for the reader, which native English speakers value as effective writing. Ting commented on this common difficulty:

> When I write, sometimes it's like a Chinese language major, writing fanatically to express oneself. But the following day when I look at my writing again, it could be nothing but garbage. Maybe that has to do with my Chinese, which I didn't learn very well. Incoherence is my big weakness. I only want to express my ideas in the way that makes sense to me but give little attention to whether others can understand me or not.
> ...
> Whenever my supervisor returns my paper, he'd say "when you hand in a paper or proposal, ask yourself if ordinary people or laymen can understand." If they understand, at least your writing is OK, pass. But if laymen cannot read it...Then I talked with my friends. Some papers especially at the PhD level are, by nature, not easy to understand. Maybe it's a characteristic of English writing that others [including laymen] must understand you. (Sept. 6, 97)

In contrast, the Chinese language is more writer-oriented. Chinese essay writers, especially those well-versed in Chinese, tend to make liberal use of idioms and set phrases, paying more attention to personal display of linguistic richness than to readability for the audience. If the reader cannot understand the writing, it is often because the reader does not have a good enough knowledge of the language or the subject and therefore should study more before attempting to read. Zhu (1992) in her dissertation on Chinese ESL writing also commented that Chinese writings were writer-centered, and demanded more of the reader to make sense of the text. The discussions in the English writings she studied were general and implicit. Alternatively, Block and Chi (1995) characterize Chinese text as more writer-based. The argument they give is that in a homogenous culture, the reader, if well-educated, is assumed to share the knowledge of the writer and therefore the writer does not have to be overly concerned about the reader. On the other hand, English is reader-oriented, working the opposite way, especially in case of research proposals. The writer has to constantly check to make sure even lay persons can understand the writing. If the reader cannot understand it, it is because the writer has failed to produce clear writing. The reader-orientation may relate to Western values such as humanity and equality in a culture which is highly heterogeneous.

Hinds (1987) suggested the phrase "reader vs. writer responsibility" to describe this language difference. It seems that reader vs. writer responsibility is based on the perspective of interpretation: who is responsible for interpreting the text by the reader? I use a different term: writer/reader orientation, which is based on the perspective of composition. Hence the question is who the writer is thinking of, the reader or the writer.

Another cultural difference which could help account for the students' stylistic problems is that the English way of expressing ideas or opinions is more democratic, more tolerant of deviations, while the Chinese way tends to be more definitive, more restrictive, and harsher. In fact, this cultural difference is reflected in the respective languages. Consider my interview with Zong:

> Z: If you compare the Chinese way of speaking with English, if you translate it directly, they are quite different. Because of the culture difference, that could turn people away. I think so.
> J: What do you mean by differences?
> Z: I find one of the differences, I like the way NES people express, to voice you want to voice a different opinion, let's say. Chinese way of saying something different is more definitive, more harsh. The English way is much more acceptable, acceptable to your opponent, if you want to say something different, for argument's sake.
> J: It allows for a different opinion.
> Z: That's something I find very useful. Let's say you and I have a different opinion. That happens all the time. But if you use the Chinese way to express it, or if you directly translate what you feel what you would feel in Chinese, to English, and say it, you would

> turn people away. But if you use the English way to say it, to express your different opinion [e.g. using the subjunctive and various modal verbs], it would be much more acceptable to the people you try to get the message across.
> J: I don't want to use the word 'democratic,' but it looks like...
> Z: You COULD. I think. I find it's very interesting.
> J: I agree. I find it too.
> Z: Like in my job you constantly negotiate [with others].
> (Interview with Zong, April 8, 98)

Even though my conversation with Zong was mainly about speaking, similar cultural differences apply to writing. Compare what Ting said on this issue:

> I think the formats are similar. But in the [English] discussion and conclusion parts the tone is flexible and conservative. In China, many ideas which have not been proved are claimed as true. Here as long as an idea is not thoroughly proven, people do not make conclusive conclusions. In the sense the papers here are more conservative. (Aug. 29, 97)

Ting perceived the English style of stating conclusions as conservative (not necessarily in a negative sense) and the Chinese style as more definitive. He thought he wrote English in the Chinese style because his professors often marked his writings for not providing sufficient evidence. In a recent study of Hong Kong Chinese scholars writing in English for publication, Flowerdew (1999) finds that his participants also experience difficulty in making claims for their research with the appropriate amount of force and are often overly assertive.

Writing in the accepted English format initially posed other challenges to some of the students. While some instructors gave very detailed explanations in their course outlines about the format students should follow in writing their course papers, it was obvious from the course outlines I collected from both students and faculty that not every faculty member did so. As a result, students were left groping in the dark. For example, some of Ping's instructors did not explain in the outlines the format to use, so in writing his papers Ping used the format he learned in China. True, he had read many English articles as course readings. But he was not told that those journal articles contained the format he should follow when writing English papers and journal articles. Not surprisingly, the sample papers which he gave me were all written in the Chinese format. When I asked him to explain, Ping complained about the lack of detailed instructions from his professors:

> P: Yeah, I think I have difficulties because the most important one is, I don't know exactly what's the standard I should follow. So there is no conflict. I don't know the English format. So I have to write according to my Chinese style.
> J: Because you have no idea of what the English style is. But don't you think – you must have read some journal articles. Right? Didn't you notice the differences when you read the [English] journal articles? Or you just paid attention to ideas, not to format, style, etc.?
> P: I have to say I paid attention. But when I write it, you see, I can follow principles. But after that, how to write each sentence? How to organize the whole paragraph? I know the first sentence should be a topic sentence, and the last one [should be a conclusion]. But how about in the middle? How to make your opinion step by step? That's not very clear.
> J: I see.
> P: Because the content you want to express is different from what you have read. So there are some differences.
> (Interview with Ping, Nov. 29, 97)

More surprisingly still, his professors did not seem to mind the Chinese format that Ping used, for he received as good grades as his content and language deserved.

Ning, however, did not get away with writing in his Chinese style. He was penalized for not writing in the format which was expected but which nonetheless was not made clear to him:

> N: So I put table. I put title. English I try to get from literature. Still, I don't get a good mark. They say 'you didn't organize well.' So I don't [know] how they require organize well. If I know that, I can do better. Actually they didn't have a very formal format there.
> J: So there is no clear format that everybody can follow.
> N: They think clear.
> J: Not clear to students.
> ...
> N: For my part, I think I didn't fully understand their expectation. And for their part, I think their expectations or requirements were not clear.
> (Interview with Ning, Jan. 2, 98)

Only when he came to write his comprehensive exam paper and consulted some of his committee members did he realize that he had to make effort to provide supporting details for his statements and generalizations. Ning further recollected on his bitter experience: "...they said they require students' writing is in detail. But when you write in detail, it is difficult to process. So you have to be pushed to be in detail" (Jan. 2, 98). What Ning and Ping suggested was that to change their Chinese habits when writing English essays, they sometimes needed the teacher to point out and ideally, explain what exactly s/he wanted. Otherwise, the students were likely to keep using the Chinese style or format in their English writing, until some future time when they received feedback on their publication contributions. This suggestion, in principle, should also apply to problems in the other categories.

6.3 Thought Transcription

A general writing challenge that seemed to concern all the Chinese students, to varying degrees, was how to put their thoughts into appropriate English. In other words, they often found it difficult just to express themselves using accurate English words and expressions. In this section I first discuss this general challenge, and then explore it in terms of parts of the research paper. One or more students specifically referred to discussion, conclusion, rationale, and experiment design though not all found all these parts difficult. As part of the discussion, I try to indicate why thought transcription in English was difficult for the students, and in some cases, what they did to try to overcome the challenges.

Several students reported difficulty in expressing themselves in English. They had ideas in Chinese but simply to express them in English proved difficult, more difficult still if they wished to use appropriate words and expressions. Consider what Qing and Xing had to say on this challenge:

> Q: Just how to express. Sometimes when you have done something, you think it's much easier to tell somebody in Chinese what you have done, what's the importance of your work. But how to express in English?
> J: You have the ideas but hard to express them. Are these ideas coded in your mind in

> Chinese or English? If the ideas in your mind are coded in English, it will be easy for your to express. But if in Chinese, then...
> Q:...Chinese. I guess mostly should be Chinese.
> (Interview with Qing, Nov. 20, 97)

> Especially I find it hard to express my ideas in precise and accurate words and expressions. I know the ideas but often cannot find a satisfactory expression.
> (Xing, Interview, Nov. 18, 97)

As a result, Qing received a poor mark on the term paper she was talking about. Even though she believed she had conducted satisfactory experimental research, her work could not be duly presented and evaluated. Her inability to describe what she had accomplished in research using competent English made her feel very unhappy:

> Actually I have done a lot. When I came to writing, I didn't know how to say it. When I write in Chinese I think it's OK. But I didn't know how to say it in English. It's very bad.
> (Qing, Interview, Nov. 1, 97)

Wang, too, had such difficulties. To overcome them, he consulted or revisited the English source texts and articles, and tried to find or remember the English expressions that could convey his ideas:

> W: Actually you have the idea in your mind but you don't know how to express it.
> J: So you go back for expressions.
> W: Yeah.
> (Interview with Wang, Dec. 5, 97)

When Ling met such difficulties, she had to translate her Chinese ideas into English, often with the help of a Chinese-English dictionary. However, she did not seem to like her translation:

> Sometimes I want to...I don't know how to express my ideas clearly. But I have some Chinese words in my mind, but I got to translate into English. But translate doesn't exactly express my idea. So I'm not so happy when I translate [into] English. But I can't find the words within my range of vocabulary. (Jan. 10, 98)

Bing, like Ling, also resorted to translation in such cases. But what came out of her translation was what she perceived to be Chinese-style English. Bing elaborated:

> B: For me I want the paper write in real English not Chinese style English. That's really hard. Because the thinking, sometimes I use Chinese to think something. Then after that I translate to English. And also I find it difficult to use appropriate words. Also the sentence, and grammar.
> J: So to express it in the English way is hard.
> (Interview with Bing, Dec. 9, 98)

As could be expected, Bing's Chinese-style English contained problems in diction and grammar, and most likely, clarity of meaning too. In fact, such problems were often unavoidable for the students when they used translation to write English (see 5.2.2, especially 5.2.2.4, for more details on translation as a writing method).

In terms of parts of the research paper, the discussion presented a challenge to many students: the discussion of one's own research, presumably different from that of others, was supposed to be original. So, strictly speaking, the students, if they were to produce original writing, could not find sources to borrow sentences from. Instead, they had to be creative, relying on themselves. To some students the discussion part posed more difficulties than any other part of the research paper. Ling attested:

> L: Because you have to express your ideas clearly in this part but literature review is just summary of someone else's work, it's not so difficult. There's something there, you just summarize. For the methodology it's not difficult. You just describe the procedure one by one. But for the results and discussion, even you get very good results, sometimes you cannot explain clearly. I really find this part the most difficult and also spend more time.
> J: Several students have expressed the same difficulty.
> L: It's true I think.
> (Interview with Ling, Nov. 23, 97)

Wang spelled out why discussion was difficult when I asked him what he found to be the most challenging aspect of paper-writing:

W: Actually how to describe. For example, you got some data from your experiment, how to explain them, how to interpret them, relate them to the formal work. Sometimes your work based on some papers.
J: Discussion.
W: How to do the discussion, how to do the comparison between your result and those of others?
J: So to discuss the work in the framework of the research.
W: How to find the meaning of your work, summarize your work actually?
J: Do you find it hard, the expression is hard or just to discuss it is hard?
W: The expression is hard.
J: Harder than ideas, the organization?
W: Normally you have got the ideas. Normally it's a new idea, a new discovery from your experiment. There is no one. You cannot find them in any other papers. Then how to describe it properly. That's hard.
J: OK, I see. It's still a kind of expression, how to express it in a way that makes it interesting, that makes it deserving because that's something important.
(Interview with Wang, Dec. 5, 97)

Wang had new ideas from his experiments. But how to discuss his new ideas by relating them to previous research was not easy. Although he could consult reading sources to find appropriate expressions, the original nature of his research meant that those expressions might not always be out there.

Feng also found discussion challenging because discussing his new content was difficult. Moreover, he had to argue for his new methods and findings against competing alternative possibilities. This kind of argument not only was difficult in terms of its requirement for accurate and forceful expressions but also caused him to feel somewhat uncomfortable as he had been used to "exchanging ideas" with colleagues in China instead of arguing with other researchers. Feng responded in one interview:

J: What aspect of the paper-writing is most challenging?
F: I think discussion in paper.
J: Why?
F: Because when you discuss results, they have challenging content. Also when you write some sentence, you cannot get model, right?
J: What do you mean by content? You mean your content is new in a sense because you are doing something new?
F: It's new. Sometimes you cannot say this is this. There's some argument from other papers. So from this content, you should say maybe this, why maybe this; maybe not this,

> why? Give some reasons. Language concern is the first concern. Other concern is yes, they have argument, ideas.
> J: So there is something about ideas and content.
> J: Do you do that [argument] in China or you just do your own work?
> F: In China they have idea exchange [no argument].
> (Interview with Feng, Nov. 19, 97)

Feng touched on one element highly valued in Chinese culture: maintaining harmony, even in research writing (cf. Ballard & Clanchy, 1991; Cadman, 1997; Shen, 1989). If two researchers have different views or findings on a common topic, they may exchange ideas. But if one researcher chooses to attack or fiercely argue with another who has different views, that could cause the latter a "loss of face," which in turn would be likely to create an enemy for the former.[7]

Kang also found discussion difficult but also mentioned conclusions:

> J: OK. And you find the conclusion is difficult or the discussion part?
> K: Discussion part and conclusion part.
> J: OK. Those two.
> K: Even in your thesis examination, that's the most important part.
> J: Yeah. That's probably the hardest part.
> K: Every reviewer will focus on this part, not your result, your experiment. They will say 'what do you get? what's the meaning of [what] you get?'
> J: What do you make out of it?
> K: Yeah, you have to be very serious in this part. Otherwise, you'll be in trouble.
> J: So, not only just language. You'll also have to be careful about your argument, your

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[7] Maintaining harmony in Chinese research writing, as suggested by Feng, appears to contradict Zong's description earlier of Chinese research writing as being more restrictive and harsher than English. This apparent contradiction can be explained this way: the two seemingly opposing views were each stated in a different context. Zong made the comment when comparing Chinese with English. His view helps to account for an observation that Chinese research articles often exaggerate claims by using superlatives (e.g., *the most*). In doing so, they restrict alternative claims or the possibility of having their own claims further improved. In this sense, the language can be perceived to be definitive, restrictive, and harsh. Feng suggested that Chinese scholars do not like to openly criticize others, especially authorities, so as to save face. If they have new ideas or findings, they usually just claim them as such without having to reject particular opponents in order not to stir up a war. At best they may just refer to the field in general. Feng's view can also be explained in another way. Chinese scholarly tradition favors a conserving attitude to knowledge over controversy and values appreciation over criticism (see Ballard & Clanchy, 1991). One of the driving forces is the desire for harmony. In this tradition there is a willingness, and often a pressing force, to respect authority and tolerate ambiguity, especially opponents who are in a powerful position.

> thinking.
> K: You know sometimes the same thing depends on how do you say. You say in this way, that's in this stage; but you say it in the other way, it will be the other stage. But we have the same experiment, the same result. That kind of language skills.
> (Interview with Kang, Nov. 22, 97)

Kang could be referring to the use of modal verbs such as *could*, *might*, *may*, *can*, *must*, and *will*. I found by reading the writing samples that most of the Chinese students were not used to using these verbs to express different levels of modality. Instead, they usually used full verbs (e.g., *produced*) and the strong modal verb *will*, which tend to express more definite happenings rather than allow for alternative possibilities as some circumstances might require.

On the basis of argument, rationale is similar to discussion. That is why Ming specified writing the research rationale as his challenge since the rationale involved strong reasoning and arguments. Frankly, writing the research rationale and discussion can also pose challenges to native English speaking students, while to Chinese students who have just transferred to Canada, these challenges appear much more taxing. In a recent study of Hong Kong Chinese scholars, Flowerdew (1999) also notes introduction and discussion/conclusion to be the most difficult parts of a research paper to these scholars. The reason is that such parts require a persuasive style of writing to convince their readers of the importance of their research and the arguments to put forward.

Ning was the only student who found it difficult to describe the experiment design. However, the reason he gave was similar to that for discussing one's original research:

> The most difficult part is experiment design. Not literature review because literature review, you just put the information you collected on here...Experiment design, you have to use your own words. No one has done this. You have to write your own words. (Jan. 2, 98)

As his experiment design was new, Ning had to create his own description rather than rely on source readings for information and language as he had done for the part of literature review.

To conclude, one of the greatest challenges for most of the students was to present their original research in their own language in various parts of the research paper. While some eventually accomplished the writing on their own, others had to borrow sentences from source readings. For some parts, such as literature review, which was not based on their own experimental research, they often copied sentences from source readings, sometimes with modification. The consequent challenge remaining for the students was to use references properly when they quoted sources directly and indirectly. It was a challenge because they had to use others' expressions, and even sentences, so often, while they were not used to providing many references or always crediting quoted sources as required in Canada.

6.4 Information-Management and Organization

In close relation to, and consistent combination with, challenges in transcribing thoughts were those the students had in managing information and organizing the paper. Specifically, information management means sorting out the information the students had gathered from their readings and experiments or field work, and deciding which parts to include and exclude in the paper to be written. Organization pertains to arranging the selected information in the desired logical order and getting prepared, sometimes in the form of a plan or outline, to start writing the paper. In addition, organization can also mean getting prepared mentally, as well as materially (i.e., in terms of information), so that one can have the necessary concentration to start and keep writing. Below I examine these challenges in more detail, using data from my interviews with the individual students.

When I asked Xing what aspect of the paper writing was most challenging to him, he specified the introduction:

> Writing the introduction. Finding the topic, decide what to talk about in the proposal or paper....The major problem is you have a lot of thing to write but you should organize them properly. I think this is a problem. (Feb. 15, 98)

Writing the introduction was challenging to Xing because in this part he must select and present his research topic and introduce what he intended to write in the rest of the paper and how to proceed with the writing.

Similarly, Ying found the term paper the hardest of all her assignments because it was a research paper; she had to organize not only the information she had spent much time in gathering but also her own thoughts about the paper:

> J: You said the term paper is the hardest. Why?
> Y: First, a lot more information needs to be organized.
> J: OK. Maybe also you have to write many, many pages.
> Y: Yeah, just lots of references. Just organizing material, and organizing your thought. That's the major part of your work and get all the references, the selections...
> (Interview with Ying, Nov. 24, 97)

On the other hand, Hang found the literature review difficult to write because it normally contained "much language." He must summarize his readings on the chosen topic, and then also analyze and discuss the findings in the readings so as to create a niche for his own research:

> J: What aspect of the paper-writing is most challenging?
> H: I think the review.
> J: You mean the literature review?
> H: Yeah.
> J: Why?
> H: Because it uses much language.
> J: Do you mean the language is difficult or do you mean to summarize is difficult?
> H: Both. The language is difficult. You should comprehend and combine the different authors. Not only summarizing. You should analyze and discuss.
> J: So it's both language and content.
> (Interview with Hang, Dec. 15, 97)

Ding had a challenge writing up the discussion part. Faced with so much information and/or so many findings about his topic or problem, it was difficult to decide on the aspect with which to start discussing his research problem. In this situation, he would ask the instructor about the length of the paper required, and then simply present what he thought to be the most advanced information or the findings with the most potential of being interesting or significant:

> D: I don't know how should I discuss this problem. I don't know from which point, from which aspect I should start the discuss.
> J: You mean for a term paper there is a lot of information, you don't know what to put in.
> D: Yeah.
> J: So what do you do about it?
> D: Just ask the instructor how many pages do you need.
> J: I see.
> D: Just write most advanced things.
> (Interview with Ding, Dec. 29, 97)

While the most advanced findings were likely what he set out to find in his study, his most advanced findings might also be something else, given the developmental nature of scientific research. If he did not properly present what he thought to be important information or advanced findings (by relating them to the research problem and indicating the developmental process of his research), then his paper could appear disorganized.

Like Ding, Ting had problems with discussions. But unlike Ding, who often had too much information to deal with, Ting often lacked proper information or experimental evidence to support his new conceptions and claims:

> The most challenging aspect for me in writing scientific papers is the discussion part. It's not a language problem but one of evidences. I don't have enough evidence in hand. When I write papers, I like my ideas to be new. So I often can't find sufficient evidence for the time. (Aug. 29, 97)

While I reviewed with him his sample writing, a research proposal written for a seminar course, Ting believed that one reason he did not have sufficient evidence was that the students were asked to write research proposals too early in their programs. Since they had just arrived from a totally different environment and culture, they lacked ready ideas for a project. Therefore, much of what they wrote was "forced thinking" devoid of adequate theoretical consideration and empirical support. Ting suggested that after the second or third term might be a better time to write research proposals than before the end of the second term.

An equally important kind of organization for writing research papers was to get organized mentally: to become concentrated, to get into the writing mood, so that writing might flow. When I asked Zong about the hardest part of writing, he said,

> I guess it's always hard to get started, like everything else. I still have the problem with me. If I want to write a report (I do less paper writing now), you want to put yourself in that mood. Once in the mood, actually everything flows. (April 8, 98)

I would imagine that most Chinese students, myself included, had this problem. These students often found it a challenge just to get prepared mentally to start writing, or to get into the mood, because of a variety of pressures and distractions. These pressures might range from language, to culture, and to student identity. While the language pressure may be evident for most Chinese students, that of student identify needs some explication as there are special causes to consider.

The word "student" has very different meanings and implications in China from what is understood in Canada. Students in China, at all levels, are supposed to study and do nothing else. Once in university, the student receives financial support from the government and/or parents. Graduate students normally receive a small stipend from the government, live in bachelors' rooms with other students for free, and usually remain unmarried before graduation unless they are in service (i.e., holding a job) or have worked for some years. Upon being awarded degrees, they will either be assigned to work positions or have the freedom to choose from many job offers. Seldom do they remain unemployed. But being a Chinese graduate student in Canada implies very different challenges and responsibilities. The student has to study, work, worry about the future, and if married, take care of his/her families and sometimes even parents. Consider what Ding said on this issue:

> D: Because student is not same as when you were student in China. Anyway you have so many pressure here because you come to this land, you have to face basic living, survival, how to struggle for this. So you cannot, not be like other students - don't need to worry about many things. You need to worry about work, future, everything. You cannot totally concentrate on your study. But in China you don't need to worry about anything. That's different. Little by little, you find you get old. You find it's not good. You find the student is so young. You are so old, still a student. You don't want to be a professional student.
> J: So you want to get out of it, and start your career and begin your full-time work. I think it's a good point.
> J: Students in China, they can concentrate on their studies. The government still provides some money?
> D: I think [so].
> (Interview with Ding, Dec. 29, 97)

Undoubtedly, NES students at UBC also have worries and pressures. But for the Chinese students, the pressures mentioned above were most likely greater. More importantly, they were not used to handling their worries and pressures. Naturally, they took longer to get into the writing mood. Even once in the mood, they still had to struggle with the other challenges examined so far.

6.5 Summary

In this chapter I have discussed the challenges of the Chinese student participants in writing course assignments and thesis proposals in four categories: vocabulary and grammar, style, thought transcription, and information management and organization. The challenges in vocabulary were typically related to technical terms and the use of sentence connectives. Despite what they knew about grammar as shown in their scores on the TOEFL, a test they must pass before admission to UBC, they displayed a lack of facility in using a variety of sentence structures in academic writing and often made grammatical errors. These findings revealed a gap between their formal knowledge and practical language skills. While not every one of the students reported considerable difficulties in vocabulary and grammar, all of them encountered challenges in rhetoric and style. Typical rhetorical concerns included the lack of clarity which resulted from awkward language, illogical thoughts, and writing for the writer. Some students also reported challenges in using appropriate styles of writing either because they were not clear what the written style was, or because they tried to avoid using complex structures that were more likely to cause errors. Some students had difficulty supplying detailed information and references when necessary. Some tended to write definitive statements and conclusions without sufficient evidence. One reason would be the influence of the Chinese language which is typical for its relatively short structures. Another reason was that few students had ever been formally taught the appropriate style for academic writing.

Putting thoughts into words, especially appropriate words and expressions, was often difficult, especially in writing certain parts of the research paper such as discussion, conclusion, rationale, and experiment design. Such difficulties arose because they were presenting original research and they had to write in their own words since they could not find phrasings in other sources that exactly expressed their ideas. Further, some students met a challenge in reasoning and providing arguments for their views and findings. If they borrowed language from other sources, they needed to provide references properly in order to avoid being accused of plagiarism.

Finally, some students faced challenges in managing the information from their readings and their own research experiments, and in organizing the paper to logically and adequately address the research topics or problems. Except the case of Hang, these difficulties with information management and organization could have more to do with writing experience and writing skill development in general than with writing in an L2 *per se*. In other words, they might be just developmental (see Mohan & Lo, 1985). In addition, several students encountered a challenge in getting into the writing mood. One common reason for this challenge was their numerous worries and pressures imposed by life as they adopted the identity of students in the new culture.

CHAPTER 7: THEORETICAL DISCUSSION

In this chapter I present a theoretical analysis of some of the findings of my study described in Chapters 4-6 and relate them, where possible, to relevant theories and proposals advanced in the research literature. Thus I hope to contribute to the research in L2 writing in general and L2 disciplinary writing by ESL graduate students in particular. To this end, I choose to focus on three major issues which I think are especially significant for my study and for L2 disciplinary writing research. Firstly, since my student participants were writing text-responsible assignments (i.e., those in which the writer must display knowledge of the content of the source text(s) and/or some other external reality such as experiments), I wish to examine what reading-writing relationships meant to the participants. Secondly, as Chapters 5 and 6 indicated, when most of my student participants wrote assignments, they had to resort to copying and modified copying to varying extents. However, this strategy has been traditionally associated with plagiarism (Howard, 1995) and prohibited by the regulations in most of the Western academe, especially in North America. Yet, some research in both L1 and L2 writing has started to question the traditional notion of plagiarism (e.g., Dillon, 1988; Howard, 1999; Hull & Rose, 1989; Pennycook, 1994, 1996b). With reference to the research and my study findings, I challenge this traditional notion. In particular, I scrutinize the very nature of writing English text-responsible assignments by Chinese ESL graduate students in sciences and engineering. Then I try to reconceptualize language reuse by ESL writers who are in the developing stage. Finally, I consider some theories and propositions related to the medium of thinking in L2 writing in light of the evidences of my study. A thinking medium means the medium in which thinking takes place, whether in the mother tongue or a second/foreign language. I then offer my interpretation of thinking media and language-switching of L2 writers.

I choose to focus my discussion on the first two interrelated issues because they are especially important for my student participants who relied heavily on reading sources to write source-based assignments. This reliance, however, could pose threats to their academic well-being and jeopardize their academic careers unless the traditional notion of plagiarism is modified to recognize the nature of writing disciplinary English texts by ESL graduate students. Further, as Pennycook (1996b) rightly pointed out, the study of textual borrowing is particularly significant for L2 education because it

> goes to the heart of a number of key issues in second language education: the role of memory, the nature of language learning, the ownership of texts, the concepts of the author, authority, and authenticity, and the cross-cultural relations that emerge in educational contexts. (p. 226)

In other words, textual borrowing issues are critical for L2 education, more so because they have raised considerable controversy among both researchers and practitioners. I choose to focus on the third issue, thinking media, because it has important pedagogical and educational implications for L2 writing, as I discuss later in the chapter.

7.1 Reading-Writing Relationships

As indicated in Chapter 2, the assignments the graduate students in my study wrote were typically text-responsible academic writing (Leki & Carson, 1997). That is, the writer must display knowledge of the content, and possibly limitations, of the source text(s) and/or some other external realities such as experiments and field work. In other words, the students usually must read source texts and/or rely on source information in order to write. Conversely, how did the students make use of the source readings in order to write the assignments? Or what were some of the reading-writing relationships or connections to the students? Before addressing this question, I wish to see what research in ESL writing has to offer, whether the theories presented in the literature can account for the findings of my study, and how my study can contribute to this line of research.

The studies that investigate reading-writing relationships to benefit writing among ESL/EFL students have mainly been concerned about composition by ESL undergraduate students and motivated by pedagogical purposes (e.g., Carrell, 1987; Eisterhold & Carrell, 1987), namely seeking techniques to teach students to write better compositions with more ease. For example, Carrell (1987) utilizes schema theory previously applied to research in ESL reading comprehension (e.g., Carrell, 1983, 1984a, 1984b, 1985; Carrell & Eisterhold, 1983) to see how schema theory may help with ESL composition. Schemas are mental representations or organizations of knowledge. Linguistic schema relates to the reader's prior linguistic knowledge (such as knowledge of vocabulary and sentence structures); content schema to the reader's prior background knowledge of the content area; and formal schema to the reader's prior knowledge of the rhetorical structure of the text (Carrell, 1988). Schema theory views reading texts as sources for linguistic, content, and formal schemas or structures (Swales, 1990). Using schema theory, Carrell (1987) examines reading-writing relationships in order to better teach written composition for intermediate-level ESL students. She suggests that teaching ESL writers about the top-level rhetorical organization of expository text (i.e., formal schemas), teaching them how to choose an appropriate plan to accomplish specific communication goals, and teaching them how to signal a text's organization through appropriate linguistic devices should help ESL students at the intermediate level to produce more effective writing. By extension, an immediate implication can be drawn from her study; that is, when reading narrative and expository texts, intermediate-level ESL students could gain knowledge from the reading texts to form linguistic, content, and rhetorical schemas and that these schemas, in turn, should aid the students in writing narrative and expository compositions. As expected, this implication is suggested in a separate study

(Eisterhold & Carrell, 1987) which shows that explicit training in rhetorical structures for ESL reading facilitates ESL writing, especially in the persuasive mode.

However, in-depth analyses of reading-writing relationships among ESL students in graduate disciplines is lacking (Connor & Kramer, 1995). In an attempt to fill the gap, Connor and Kramer (1995) conducted a study of three ESL and two native-English-speaking (NES) graduate business students writing a business course assignment. In particular, they tried to find out how the ESL students filtered information from a lengthy business case and wrote a persuasive argument. In keeping with Raimes (1985), they observed that the unskilled ESL students who were insecure in vocabulary choice resorted to the strategy of directly borrowing words and phrases. They further noted that Asian students, in particular, who were taught to respect written texts (Matalene, 1985), tended to summarize and synthesize information in source texts by relying on the "truth" rather than build arguments from evidence. However, they made no attempt to formulate any significant theory regarding reading-writing relationships. Swales (1990) explicates his genre analysis of academic and research writings, but does not directly address the reading-writing relationships that occur in writing practice. Yet, by relating to schema theory he seems to suggest that by reading texts, students can acquire frames (or schemas) for knowledge of the register most appropriate in different contexts and for knowledge of genres for specific purposes.

With the above research in mind, I re-analyzed my findings, looking at how my student participants perceived the reading-writing relationships in light of schema theory. As described in Chapter 5, I found that when the students read source texts, they learned the language, that is, words, sentence structures, and so on, from their source readings. They also learned the format and structure of the research paper. The following provide some illustrations:

J: What have been the effects of your readings on your writing?
N: Reading has big effect on my writing.

> J: In what way?
> N: Info. I said bricks. That's one thing, the first step of my writing. And also from [reading] is English for my writing. And knowledge from my reading.
> J: The content.
> N: Without reading you can't write. I don't have bricks [ideas and language]. I don't have a house. So that's very important, the relation of bricks and house.
> (Interview with Ning, Dec. 5, 97)

> J: What have been the effects of your readings on your writing?
> L: Every time I write a paper I have to read a lot.
> J: In which way do you use those readings for the purpose of your writing?
> L: Structure.
> J: By reading those articles, you get your ideas?
> L: Yeah.
> J: Refresh and organize.
> L: Yeah.
> J: So both for structure and for the ideas.
> L: Yeah.
> (Interview with Ling, Nov. 23, 97)

Sometimes, they deliberately read the texts in order to find useful terms and/or article formats. Then they tried to use them in writing assignments. In other words, the source texts provided them with some of the linguistic and formal schemas necessary to compose writing. For example:

> J: What have been the effects of your readings on your writing?
> F: Helps a lot. First you know the format, the format of the paper; also you know some sentence from the paper. That sentence is model when you write.
> J: Sentence, you mean the structure, language, or words, style?
> F: Style, language.
> J: But you don't copy word for word.
> F: No.
> (Interview with Feng, Dec. 23, 97)

> Y: When I am writing, I try to find an English model, a paper, and try to follow the format and the style of the writing. I normally have a reference there.
> J: But you don't copy the sentences.
> Y: Sometimes you copy the sentences.
> J: But you quote.
> Y: You either quote or later come back and modify it in a different way.
> J: And give the reference.
> Y: Yeah.
> J: I think it's useful to have a model, especially one that is close to your topic, your subject.
> Y: You learn the organization of the paper as well.
> (Interview with Ying, Nov. 24, 97)

However, once acquired, these schemas did not always remain. They tended to be forgotten. So sometimes when Wang had ideas to express for an assignment, he had to revisit the reading sources to refresh his memory.

> J: When you later write papers, do you go back to it [the reading] for info or for expressions?
> W: I think most of the time for expressions - how to expression this idea in English.
> W: Actually you have the idea in your mind but you don't know how to express it.
> J: So you go back for expressions.
> W: Yeah.
> J: Is it like phrases or whole sentences?
> W: I think whole sentence, actually the structure of the paragraph, how to express it clearly, and you can learn from it.
> (Interview with Wang, Dec. 5, 97)

Obviously, these linguistic and formal schemas were often crucial for the students' successful completion of their writing.

Perhaps more importantly and more frequently, the students read the source texts in order to gain knowledge or information from the readings. Such information provided the base out of which the students developed the content schemas they needed to write their course assignments. It is worth noting that the students not only made use of the information and schemas directly in their writing, but they sometimes had to find out if the information was imperfect or limited in some way. Out of such findings, they created their own research space (Swales, 1990), as Xing explained in one interview:

> Through reading I know what has been done on a topic and what methods have been used. Then I know what the drawbacks for those methods. This way I find my own research topic and sometimes try to improve those methods. (Nov. 18, 97)

At other times, the students had to keep reading source texts to refresh their memories and/or to expand their content schemas in order to create a writing mood before they could start to write, or continue to write after a break. Once they were in the mood, or immersed in the schema, their writing might actually flow, as Wang described.

> J: What have been the effects of your readings on your writing?
> W: Actually if you read more, after that, you write, will be fluent or much easier.
> J: In what ways?
> W: Actually I don't know how to say. Just a kind of feeling. After you read a lot, you just feel you want to speak in English, you want to write in English.
> J: You are in the mood. Create a mood for you to write in English.
> (Interview with Wang, Dec. 5, 97)

It is worth noting that the actual writing process may serve to further consolidate and affirm content schemas as well as linguistic and formal ones. But on the other hand, if the students stopped using these schemas in their writing practice, the schemas, especially the linguistic ones, might be partially or even totally forgotten. That is why Bing and Xing found it difficult to start writing again after a lapse of time during which they did not write actively. Here is an illustration about Bing:

> J: How does your reading help your writing?
> B: Yeah, sometimes they did. For the last two term when I took the courses, my writing is getting better. But now after I stopped reading and taking courses, I think my writing, I don't know how to start.
> J: You feel more rusty?
> B: Lose confidence about my writing.
> J: How long have you discontinued writing?
> B: Almost a term or two.
> (Interview with Bing, Dec. 8, 97)

In addition to words and sentence structures, and content knowledge, one of my study participants, Zong, would often stop during reading to analyze the text and try to understand the thinking methods underlying the text and how these methods differed from his. That way he could learn how NES writers think to express their thoughts, how they structure and present ideas, and later he could use those methods in his own writing. The following interview segment bears upon this observation:

> Z: When you read a paper, again, just to think about how I could write the sentence, why people write this way, you almost analyze and try to find what's the secret behind the way you would write and other people would write... Gradually you learn the way the native people would express themselves.
>
> ...
>
> J: I think you made a good point just now about paying attention to language, not just grammar but the structure and what makes it good writing, what makes it good style, and that's really special and I think that's what can make your writing at least close to native writing.
>
> (Interview with Zong, April 8, 98)

The schema theory as outlined and illustrated by Carrell (Carrell, 1983, 1984a, 1984b, 1985; Carrell & Eisterhold, 1983; see also Grabe & Kaplan, 1996) does not appear to emphasize such thinking and presentation methods on the micro level, that is, methods for text construction within the sentence and sometimes among a few interrelated sentences within the same paragraph, in other words, coherence on the sentence and paragraph levels. Rather, it appears to refer to organization structures of thought on the macro level, such as the general surface level of the essay or the organization of the essay as a whole, and the development of thought from one paragraph to another. However, in light of the data of my study, all the Chinese students had difficulty on the micro level of thinking methods and idea structuring, that is, presenting ideas clearly and logically and making the text flow. Some difficulties, for example, were: the use of sentence connectives (see section 6.2); lack of clarity, illogical thoughts, and writing for the writer (see section 6.2); writing definitive statements and conclusions without sufficient evidence, failing to supply detailed information (see section 6.2); difficulty in reasoning and providing arguments for their views and findings (see section 6.3).

Doubtless, these difficulties may be mixed with and inseparable from linguistic and content problems. But few of the students appeared to have difficulty with the outline of the research paper in terms of its general structure or format. They all knew very well that a formal research paper normally consists of an abstract, an introduction, a literature review, methods and materials, results, a discussion, and a conclusion - so well that they (e.g., Ling) could even begin writing with a different part than the introduction (see Chapter 5). Therefore, to provide a better account of the reading-writing relationships for the process of disciplinary writing for ESL graduate and undergraduate students, I propose using macro-level rhetorical schemas and micro-level rhetorical schemas to emphasize the importance of, and the difficulty of learning, the latter category. To recapitulate, the macro-level rhetorical schemas generally refer to the organizational structure of a research paper or an essay as a whole, or the organizational structure of a major part of a research paper (such as the methods and materials). In other words, they represent the major steps for completing the writing. A typical example is the outline, sometimes a detailed outline, in point form according to which the work is to be written, though the outline is subject to modification. As such, macro-level structures can often be planned or known prior to writing. On the other hand, micro-level rhetorical structures pertain to how specific ideas are presented clearly and logically in a sentence or a series of related sentences and how the sentence or sentences are written so as to be rhetorically effective according to established conventions. As such, these structures are at least as complicated as the specific ideas but tend to be more complicated in writing for ESL students who may not have the English language facility to convey exactly what they are thinking. The issue of these structures becomes even more complicated when the ESL students think, usually in Chinese, according to the conventions from their native culture while being judged by NES or non-native English-speaking (NNES) readers who choose to follow NES conventions. When they had to write English texts, the Chinese students often relied on literal translation, creating various cognitive, rhetorical, as well as linguistic, problems. (Please see Appendix N for illustrations excerpted from the students' writing samples.)

Thus, whereas content schemas concern information and ideas, and linguistic schemas ensure the correct use of words and grammatical structures, how the ideas are expressed logically, coherently, and effectively through linguistic means within one sentence and across sentences is the concern and responsibility of micro-level rhetorical schemas. Though it is helpful to learn and know in advance some of the linguistic devices to express certain abstract logical relationships such as using *nevertheless, however, but, still, yet, otherwise*, and so on to express *alteration,* micro-level rhetorical structures in context normally take form only during or after the dynamic process of composing the sentences.

As indicated earlier, micro-level rhetorical structures represent, at least partially, the writer's thinking, which in turn is closely related to the writer's culture (see also section 1.2; Ballard & Clanchy, 1991; Sherman, 1992). In other words, how a writer thinks is inevitably influenced by his/her dominant culture (and sometimes cultures if the writer is a multicultural thinker). According to one view (UBC Intercultural Training and Resource Centre, 1995), culture is like an iceberg (see Appendix O). Its overt manifestations, the tip of the iceberg above water, are ways of doing (such as rituals, food, and dress). However, the body of the iceberg, which is underwater and hidden, are ways of thinking (such as assumptions, perceptions, logical relationships, and communication styles), which are based on different ways of being (i.e., beliefs, values, and the world view). For most of my student participants, this culture meant the Chinese culture. According to Ballard and Clanchy (1991) and Block and Chi (1995), Chinese culture is distant from the Western academic culture, referring to different ways of thinking and different ways of being. In fact, Chinese culture and North American culture could occupy opposite extremities on a culture spectrum. In the text, the thinking is concerned with determining the logical relationships (e.g., cause-effect) among the elements of a sentence and across neighboring sentences, and expressing those relationships effectively. Small wonder then that micro-level rhetorical structures are especially challenging to Chinese ESL graduate students who are still strongly influenced by the Chinese culture (e.g., writer-orientedness), as I showed in Chapter 6. This challenge may explain why Ping complained that although he had knowledge of the necessary words, structures, and ideas, as well as top-level organizational format, he was unable to write texts that would distinguish him from his other inexperienced Chinese ESL peer writers.

Given that micro-level rhetorical schemas are responsible for logically and effectively expressing ideas through linguistic means within one sentence and across sentences, they are essential to enable an ESL student to create texts without always having to copy the exact expressions from sources. In this sense, they are as important as, or perhaps even more important than, the linguistic and content schemas in the production of quality academic writing by ESL graduate students.

Further, with particular regard to micro-level rhetorical schemas (and also other schemas to a certain extent), I must point out that because thinking processes are highly complex, and not always linear or predictable, schemas should not be construed as always accessible to description in words or visible structures. Therefore, any attempt to reduce the micro-level schemas to a limited number of simple structures or thought patterns should be treated with caution.

In sum, I have tried to apply Carrell's schema framework for reading comprehension to analyze the reading-writing relationships found in the processes of Chinese graduate students writing disciplinary assignments. While I have used the concepts of linguistic, content, and formal schemas to describe various kinds of information the students obtained from the reading sources to benefit their writing, I have adopted another category, micro thinking methods or micro-level rhetorical schemas, to capture the methods the students learned from the source readings for thinking of and showing the relationships of elements at the sentence level, between adjacent sentences, and on the paragraph level. It is important to note that the three categories of schemas, including the subcategory of micro-level rhetorical schemas, must interact with one another in order to effect text-writing (cf. Carrell, 1987, 1988), and for this reason, must be developed together to produce competent academic writing.

One of the dangers of learning schemas from source texts, especially linguistic and content schemas, and imitating or applying them in one's own writing, is that one may reuse them verbatim without properly acknowledging the source and be accused of plagiarism. This is a highly complex and controversial issue concerning ESL graduate students learning from sources and writing source-based texts. To further address this issue, I turn to the next section.

7.2 Toward a Reconceptualization of Language Reuse

> All language learning is to some extent a process of borrowing others' words... (Pennycook, 1996b, p. 227)
>
> Therefore, each utterance [including written speech] is filled with various kinds of responsive reactions to other utterances of the given sphere of speech community. These reactions take various forms: others' utterances can be introduced directly into the context of the utterance; or one may introduce only individual words or sentences, which then act as representatives of the whole utterance... Others' utterances can be repeated with varying degrees of reinterpretation. (Bakhtin, 1986, p. 91)

As evident from my interviews with the Chinese graduate students and their writing samples, the students all used, to varying extents, the words they read in source texts, especially when writing source-based papers. While such a practice appears to be only natural for all students and particularly, for students who write in English as a second, additional, or foreign language, the traditional notion of plagiarism may forbid it. In this section, by relying on research and theories on language appropriation (e.g., Bakhtin, 1986; Howard, 1999; Pennycook, 1996b) and my study data, I first challenge this traditional notion and then try to reconceptualize what I regard as legitimate language re-use.

7.2.1 Challenging the Traditional Notion of Plagiarism

As indicated in Chapter 2, one of the most widespread definitions of plagiarism is supplied by the National Academy of Sciences (NAS) et al. (1995), which is "using the ideas or words of another person without giving appropriate credit." In a similar vein, Howard (1995), after examining several critical discussions of plagiarism concerning English L1 writers and taking into account the traceability of hypertext authorship, still defines plagiarism as "the representation of a source's words or ideas as one's own" (p. 799). Howard goes on to elaborate:

> Plagiarism occurs when a writer fails to supply quotation marks for exact quotations; fails to cite the sources of his or her ideas; or adopts the phrasing of his or her sources, with changes in grammar or word choice. (p. 799)

Though the elaboration appears more specific than most definitions, it still fails to explain: What is a quotation? What is the phrasing of a source? How many words count as a quotation or "the phrasing"? What words should count as either of them and what words should not? How are private words, which, according to the definition, must be quoted or acknowledged otherwise when used by a different person, to be differentiated from public words, which may not need to be acknowledged to be used by another person? These are not easy questions, simple as they may appear. The difficulty in answering them points to the clumsiness of the term "plagiarism" and the lack of clarity for the practice referenced (Pennycook, 1996b).

Further, I take the conceptions expressed by Howard (1995) and the NAS et al. (1995) and other similar definitions and elaborations as representing what I regard as the traditional notion of plagiarism (see also Begoray, 1996; Currie, 1998; Scollon, 1995) and argue that this view is problematic because it fails to take into account significant considerations particularly from the perspective of students who must write in English as a second, additional, or foreign language in specific disciplines such as sciences and engineering. I challenge the traditional notion by asking fundamental questions about the nature of writing by ESL students in the disciplines, by relying on support from research and theories on academic writing (e.g., Bakhtin, 1986; Howard, 1999), legitimate peripheral participation (Lave & Wenger, 1991), and "plagiarism" especially in the ESL/EFL contexts (e.g., Pennycook, 1994, 1996b), and by employing findings and suggestions from my current study of Chinese graduate students writing course and program assignments in scientific and engineering disciplines. I present my challenges below as two major arguments: 1) the traditional notion of plagiarism fails to recognize the nature of writing in a language which is not one's own; 2) the traditional notion fails to acknowledge that learning, and learning to write for that matter, is a developmental process, and that in this process, patchwriting can have positive academic values for disciplinary writers and pedagogic values for ESL students. Then I support these two major arguments with illustrations of textual strategy use from my own study.

7.2.1.1 The Nature of Disciplinary Writing by ESL Students

The traditional notion of plagiarism fails to recognize the nature of writing in a language which is not one's own and which one has not mastered to such a level as to write freely. When writing in English for academic purposes, ESL graduate students (and most other ESL students as well) inevitably have to use

a) others' words (i.e., English words) to express their ideas coded in their native or first language (Currie, 1998; Dillon, 1988; Pennycook, 1996b; Scollon, 1995);

b) others' ideas which they have learned and translated into their L1 as their knowledge; or

c) others' ideas and words which they have learned and retained in English as their knowledge.

In any case, ESL students, by definition, must always use the words of another person (unless they I nvent words) to write English texts. Currie (1998) and Pennycook (1996b) refer to this process as "borrowing others' words." I prefer to speak of *using* others' words: borrowing implies a further process of returning like borrowing books from the library or money from a bank while *using* simply implies taking words, and therefore language, as a tool, a medium, to express ideas. When writing in English in the disciplines, generally ESL students who think in L1 have no choice but to use others' words to express their ideas, or use others' ideas or both ideas and words to display the knowledge they have just learned, or even created. The simple reason is that

> our thought itself - philosophical, scientific, and artistic - is born and shaped in the process of interaction and struggle with others' thought, and this [latter thought] cannot but be reflected in the forms that verbally express our thoughts as well. (Bakhtin, 1986, p. 92)

As my study findings show, many of the participants such as Wang, Ning, and Ling deliberately visited or revisited texts in books or journal articles to search for proper language to express their ideas (see quotes from interviews with Ling and Wang in section 7.1 above). They might have acquired these ideas (most probably coded in Chinese) through direct interaction with, or inspiration from, the English source texts they read. Ding kept a notebook especially to record or copy words and phrases from his readings and TV programs which struck him as worth learning so that he might be able to use them in his future writing. What Ding did actually represented a study strategy which has been and still is very popular with successful ESL/EFL learners in China and elsewhere. Thus Pennycook concludes that language learning "is necessarily a process of assimilating and reusing chunks of language" (1994, p. 282) and that "all language learning is to some extent a process of borrowing [using] others' words" (1996b, p. 227).

Pennycook (1996b) came to the above conclusions after critically examining his own English-teaching experiences in China and Hong Kong and the learning experiences of the Chinese students he taught there. In his seminal work on plagiarism (1996b), he explored the different relationships between learning, literacy, and cultural difference. He indicated that repetition and memorization, though largely disapproved of in the West at present, nonetheless produced excellent English speakers in China who did not necessarily talk as if reciting from texts. He noted, in keeping with the Chinese academic learning philosophy, that some form of memorization through repetition could actually lead to better understanding and mastery of the material one was supposed to learn. In a similar note, Biggs (1996) also argued that rote learning by students from Confucian Heritage cultures is in fact repetition learning leading to deep understanding. For testimony, I again present the Chinese saying: If one can learn 300 poems of the Tang Dynasty by heart, one can compose poems. In the West too, as Pennycook concludes after an extensive review of the literary traditions, "language use is marked far more by the circulation and recirculation of words and ideas than by a constant process of creativity" (1996b, p. 207). The same is true of the academic domain. In a similar vein, Dillon (1988) argued that finding one's voice in writing means "an admitting, an adopting, an embracing of filiations, communities, and discourses" (p. 71). According to Pennycook, it is nothing less than "plagiaristic hypocrisy" (1996b, p. 212) when academics apply double-standards for using others' words, one set for the guardians of truth and knowledge (e.g., professors) and another for the knowledge seekers (e.g., ESL students). These academics, who constantly emphasize a fixed canon of disciplinary knowledge but who demand the impossible practice of always putting others' words in quotes, reveal their lack of understanding of and sympathy for students, especially L2 students, who are required to learn a fixed canon of knowledge and a corresponding fixed canon of terminology.

Pennycook (1996b) points out that the Western emphasis on the creative individual "presumably has its origins in the peculiarly Western conjunction between the growth of the notion of human rights and the stress on individual property...thus making the reuse of language already used by others a crime against the inalienable property rights of the individual" (p. 214), unless appropriate credit is given. That is why plagiarism ends up being such a highly emotional and moral subject. In this connection, Scollon (1995) concludes that plagiarism is located in "an historically established system for the distribution of social power and privilege" (p. 25). But unfortunately, this system may not exist in other societies, including some Western countries. In many Asian, Middle Eastern, African, and First Nation cultures, for example, knowledge is believed to belong to the society as a whole, rather than an individual (see Bowden, 1996). In both China (including Hong Kong) and Italy (Sherman, 1992), when students write essay questions for disciplinary subjects (such as biology and history), all they need to do is to find the answers from sources and copy the answers as accurately as possible. The teachers are more interested in whether the students have learned the lessons and can provide the right answers and less concerned with how they write the answers. When the questions are to be answered in English, this is even more the case. As Pennycook (1996b) observed, "writing in one's own words" was not something that the students in Hong Kong (and most other places) could do in English, for the students seemed to feel that they had no ownership over English.

The same was true with my student participants who had been in Canada for less than two years. Even if they had started to attend English classes, did most of their reading in English, and interacted with native-English speakers, they still used Chinese to interact with their Chinese peers and friends on a daily basis and to process most of their thinking. It is not that they did not want to "write in their own words," but that they barely had any English of their own. For example, Ping commented on his difficulty in thinking in English:

> I think there are two difficulties. One is habit. I'm used to doing so [thinking in Chinese]. The second is there are some problem because I cannot remember exactly how such meanings are expressed in English. I cannot do it all by myself. And also it's not convenient for me. You know people like to do things if possible.
> (Interview, Nov. 29, 97)

Ping further explained, "But for me, the bigger environment is English but the inner environment is still Chinese" (Feb 19, 98), referring to the many Chinese students around him in and out of school. So he had little chance to learn English well enough to feel any "ownership" of it.

In fact, even professional disciplinary writers of both L1 and L2 may have to use others' language and/or ideas when writing academically. As Bakhtin (1986) argued, "Each utterance is filled with echoes and reverberations of other utterances to which it is related by the community of the sphere of speech communication. Every utterance must be regarded primarily as a *response* to preceding utterances of the given sphere..." (p. 91; emphasis in original). Though targeted at oral speech, Bakhtin's argument was meant to apply to written speech, or writing, as well. In this respect, Hull and Rose (1989) also note, "A fundamental social and psychological reality about discourse - oral or written - is that human beings continually appropriate each other's language to establish group memberships to grow, and to define themselves in new ways" (p. 151). Thus it would appear natural that Currie (1998) concludes from recent research on "language borrowing" (Cazden, 1993; Hull & Rose, 1989; Pennycook, 1996b; Scollon, 1995) that such borrowing for ESL students would be "neither exceptional nor exceptionable, but rather an instance of the social purposes implicit in the construction of text" (p. 11). Even Howard herself admits that "it is perhaps never the case that a writer composes 'original' material, free of any influence" (1995, p. 798). Finally, Mark Twain was cited by Hughes (1999) in an address on intellectual honesty to have expressed his attitude toward plagiarism rather emphatically:

> ...the actual and valuable material of *all* [emphasis original] human utterances - is plagiarism. For substantially all ideas are secondhand, consciously or unconsciously drawn from a million outside sources, and daily used by the garner with a pride and satisfaction born of the superstition that he originated them. (Cited in Hughes, 1999, p. 2)

The arguments above point to the simple truth that all writers, L1 and especially L2, must necessarily use others' words and ideas in the process of writing academic papers.

Then, it might be argued, the issue is not whether one should use others' words or ideas but how. Professional NES writers claim to copy from each other by citing the sources according to established conventions. Therefore, when ESL students write academic texts in English, they should observe the citing conventions just as the NES professional writers do. Then, the question I would pose is: Is it possible for ESL students to provide the sources for all the English words they use, which could mean virtually all the words in the paper they write? Even though they are fully cognizant of the entire Western writing convention, it is not feasible, nor advisable, to credit *all* the sources for the words and/or ideas of which they are not the originators. One reason is the limitation of current citing conventions and writing practices. We may simply imagine an article with source references in every sentence throughout the whole piece. Almost any instructor would reject it as bizarre, deviant, and clearly unacceptable, albeit strictly conventional. Another reason relates to the limitations of human memory. ESL graduate students may not have such a mental capacity, even with the help of computers, to remember all the sources from which they learn every single word or idea, or the time to do so. Sometimes, the original sources are not available because they are not provided. So, in this sense it is simply not feasible for the ESL student to provide all the sources according to the established conventions.

A more sensible consideration perhaps is that rather than forbidding ESL students to use English words, naturally others' words, without which they cannot write, a distinction should be made between a literature-review type of writing and "original" writing. In the former case, such as writing the background section for a research paper, ESL students may not need to be original in a sense, but rather would necessarily copy others' ideas and words in order to represent published and publicized research by other writers without distortion. In the latter case, such as writing parts of the discussion and conclusion of a lab-based research paper, ESL students are supposed to have "original" ideas. Therefore they should present their own ideas and findings in sentences composed by themselves, but they may be using words or phrases they learned from various sources. This is not at all surprising since "something created is always created out of something given" (Bakhtin, 1986, p. 120). Actually, such an approach is exactly how most of the participants in my study wrote their research papers. As indicated in Chapter 6, most of them found writing the literature review fairly easy because they were supposed to represent others' ideas and language. But they found discussions, and sometimes rationales and conclusions, difficult because they could not find many complete source sentences that they could use to serve their purpose. So they had to rely more on themselves. My interviews below with some of the students bear upon this observation.

> L: Because you have to express your ideas clearly in this part but literature review is just summary of someone else's work, it's not so difficult. There's something there, you just summarize. For the methodology it's not difficult. You just describe the procedure one by one. But for the results and discussion, even you get very good results, sometimes you cannot explain clearly. I really find this part the most difficult and also spend more time.
> J: Several students have expressed the same difficulty.
> L: It's true I think.
> (Interview with Ling, Nov. 23, 97)
>
> W: Actually how to describe. For example, you got some data from your experiment, how to explain them, how to interpret them, relate them to the formal work. Sometimes your work based on some papers.
> J: Discussion.
> W: How to do the discussion, how to do the comparison between your result and those of others.
> J: So to discuss the work in the framework of the research.
> W: How to find the meaning of your work, summarize your work actually.
> J: Do you find it hard, the expression is hard or just to discuss it is hard?
> W: The expression is hard.
> J: Harder than ideas, the organization?
> W: Normally you have got the ideas. Normally it's a new idea, a new discovery from your experiment. There is no one. You cannot find them in any other papers. Then how to describe it properly. That's hard.
> (Interview with Wang, Dec. 5, 97)
>
> J: What aspect of the paper-writing is most challenging?
> F: I think discussion in paper.
> J: Why?
> F: Because when you discuss results, they have challenging content. Also when you write some sentence, you cannot get model, right?
> J: What do you mean by content? You mean your content is new in a sense because you are doing something new?
> F: It's new.
> (Interview with Feng, Nov. 19, 97)

The fact that the students completed the discussions and conclusions despite the challenges suggests that they may have indeed pushed themselves to be original.

7.2.1.2 Learning to Write as a Developmental Process

The traditional notion of plagiarism fails to acknowledge that learning, and learning to write for that matter, is a developmental process (Campbell, 1990; Howard, 1995; Hull & Rose, 1989; see also section 7.3 for the developmental processes of L2 proficiency and thinking in L2). By this I mean that during the developmental stage when ESL students are still learning the disciplinary language and/or knowledge, they should be allowed to apply what they have learned from others to their written work. The application methods may include copying certain words and phrases after understanding them, and imitating the sentence structures and rhetorical styles of the source texts. That is how ESL students can learn the language, knowledge, or textual discourse expected by the academic community. However, I do not mean that they should copy whole pieces of source text verbatim to hand in as their assignment work.

According to the notions of legitimate peripheral participation developed by Lave and Wenger (1991), if the practice community routinely isolates newcomers directly or indirectly, it is tantamount to preventing newcomers from peripheral participation. Legitimate peripheral participation not only entails that newcomers "have broad access to arenas of mature practice" (p. 110) but also peripherality "requires less demands on time, effort, and responsibility for work than for full participants" (p. 110). This understanding suggests that when ESL graduate students as newcomers to the academic community write course assignments, they should not be strictly judged by the same standards that are routinely applied to full participants such as seasoned professors or other established professional writers. However, as they move toward full participation, their responsibilities, or expectations for the quality of their work, may increase. Moreover, as their participation increases, so does their sense of identity as master practitioners. This contrast between peripheral and full participants can be observed between most of the newly-arrived Chinese students in my study and Zong, a fairly established scientist, in how they performed disciplinary writing (see Chapter 4 for details). Indeed, the contrast is evident even with Zong himself between the time he first arrived at UBC in 1989 and the time when I interviewed him. Zong recalled, "I remember the first time I did a term paper, I had a hell of time to put it together actually" (April 8, 98). It is, again, natural and reasonable to have lower expectations for newcomers and to allow them time and strategies to learn and move gradually toward full participation and academic community membership.

With respect to strategies, the traditional notion of plagiarism fails to acknowledge that patchwriting can be a positive strategy for developing ESL students to learn to write maturely. Patchwriting has not only positive academic values for disciplinary writers (Bakhtin, 1986; Howard, 1999) but pedagogic values for ESL students (Currie, 1998; Howard, 1995; Hull & Rose, 1989). Patchwriting means "copying from a source text and then deleting some words, altering grammatical structures, or plugging in one-for-one synonym-substitutes" (Howard, 1993, p. 233). As indicated earlier, using others' words to various degrees is how we all write academic discourse (Bakhtin, 1986), not always or necessarily or possibly acknowledging all the words' sources. Following Bakhtin, Howard (1999) asserts,

> There is no 'my' 'own' language; there is only the shared language, in its shared combinations and possibilities. When I believe I am not patchwriting, I am simply doing it so expertly that the seams are no longer visible - or I am doing it so unwittingly that I cannot cite the sources... Patchwriting, a means whereby everyone encounters, enters, and appropriates discourse...(p. 91)[8]

Patchwriting is a crucial technique in academic writing. The only difference between different writers or with the same writer, between different times, lies in how much or how often we need to patchwrite in producing a given paper or paper segment. In this light, I agree with Howard (1999) that it is absurd to lay down the rule that to avoid plagiarism, no three words in a row are to be repeated (Drum, 1986). Research in English L1 student academic writing indicates that university student writers tend to engage in patchwriting when working in unfamiliar discourse with unfamiliar words and/or ideas (Howard, 1995; Hull & Rose, 1989). In order to help students to find a voice in writing, Hull and Rose (1989) advocate "a provisional free-wheeling pedagogy of imitation" (p. 151), on the assumption that students can make intellectual use of this transitional textual strategy and then gradually move beyond it. In this sense, patchwriting as a writing strategy has positive pedagogical values during students' learning process (Howard, 1995). In fact, reporting on her case study of one Chinese ESL student taking university business courses, Currie (1998) observes that to the student there was no other way to learn the terminology of the business community except to copy it from the book (or another reliable source). Indeed, the student was rewarded for supplying the right terminology and discourse style expected by her marker. Thus, to bar justified patchwriting, imitating, or learning as plagiarism would be pedagogically unsound (see Pennycook, 1996b).

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[8] It is interesting to observe Howard's (1995) ambivalent but ultimately critical attitude toward patchwriting, which has traditionally been associated with plagiarism. Nonetheless, she turned completely positive and argued forcefully for abolishing the notion of plagiarism that is patchwriting (1999). Elsewhere in my dissertation, I used "modified copying" to refer to patchwriting and similar practices in order to avoid the traditional association of patchwriting with plagiarism.

To further illustrate my arguments above, I return in the next subsubsection to a discussion of textual strategy use by my students.

7.2.1.3 Illustrations of Textual Strategy Use from the Chinese Students

In my study most of the student participants had been attending UBC for only half a year to two years. Fresh from their native academic culture in China, they were necessarily new to the discourse in their disciplines especially linguistically, since most of them had written very little academic work in English. So, they had to rely on heavy patchwriting, or modified copying, when they were supposed to summarize the research literature and present the sources' ideas without distortion. For instance, Ning referred to his strategy of gathering background information as "picking bricks." The "bricks" represented blocks of source texts with some linguistic modification. Once the bricks were ready, he would "build a house," namely write his paper or modification. Once the bricks were ready, he would "build a house," namely write his paper or certain parts of the paper such as background and review of the literature. Kang adopted a similar strategy.

Even in writing the parts where they were expected to be more original such as discussion and conclusion, they still had to copy certain phrases and sometimes, major parts of source sentences to express their ideas, in other words, to use others' language for their ideas. For example, when Ling was stuck in writing the conclusion of her paper, she would have to visit some sources and "learn" from the sources by using the words there. As she explained,

> Now every time I write a paper, I have to read many related papers and try to find their structure and use their structure. For example, I said I have some problem to conclude this paragraph. I will try to learn from someone else. They use this sentence to conclude. So I will use this sentence to conclude.
> (Ling, Nov. 8, 97)

Further, writing disciplinary texts for ESL students in sciences and engineering is different from writing literary texts such as novels or poems (Howard, 1995; Myers, 1998). In the former case, the writer needs to express knowledge often shared by the reader, namely the instructor, who may judge it as right or wrong. In the latter case, the writer is normally expected to create relatively unique texts, the ideas of which are often not shared by the reader. Thus different criteria may be applied in judging the different kinds of texts. This does not mean, however, that students writing novels or poems do not use ideas or words from other sources, as is evident from my arguments above.

One key characteristic of modified copying that is worth emphasizing is *understanding and learning*, which distinguish it from copying without understanding or learning. Pennycook (1996b) draws a similar comparison between one form of memorization as mechanical rote learning and another form of memorization as a means to develop and deepen understanding of the reading material. As educators, we know very well the simple truth that understanding is likely to lead to learning. For ESL students, and L1 students as well, patchwriting can be a fundamental way of trying to understand difficult concepts and learning. With learning and probably only through learning can ESL students gradually progress to become mature writers. An example in point is Zong, who had completed his PhD studies and was working as an award-winning scientist. When Zong read source texts, he no longer focused on the words only. Instead, he searched deeper for the thinking methods behind the words, and the logical-verbal relations. Truly, it can be said that he was still learning but his learning was obviously at a higher level, or more levels, than those of his newly-arrived successors. Could he then be said to be plagiarizing professional writers' thinking methods? Or was he simply practicing a kind of positive (vs. negative) plagiarism (see Howard, 1999)? On the other hand, by the time of the interview Zong had published several articles in English journals and remarked that he felt very comfortable communicating with his NES colleagues. So, even though he was still learning, as we all are, Zong had become a mature scientist (see section 7.3 for further discussion of Zong). In other words, as pointed out earlier, learning makes one mature. But if teachers view patchwriting by students as a form of plagiarism and therefore as transgressive, it amounts to

> our telling them [students] that learning is bad...to our telling them that they must always remain on the bottom of the textual hierarchy. Learning, we tell them, will move them up the textual ladder. Yet by outlawing the learning that is patchwriting, we are obstructing rather than facilitating that movement. (Howard, 1999, p. 91)

For most of my student participants and the student Currie (1998) studied, modified copying, or patchwriting, served two purposes: it made up for the students' still developing English language and helped them survive the stringent academic requirements, and it also constituted part of the learning process in moving toward mature writing. As ESL students, they have no choice but to learn the language expected by the academic community *and* use it in order to be perceived as a member of the community rather than an alien to be stigmatized. On the other hand, it would be against common sense to expect ESL students to learn one kind of language but to use another (e.g., Chinese English, or literal translation from Chinese). It would create another "Catch-22" situation to expect them to write like professional writers on the one hand but forbid them to imitate or learn the language and style of the professional writers on the other. If academics are serious about inducting inexperienced ESL students into their discourse community, to talk their talk, walk their walk, and write their "discipline-specific language" (Starfield, 1995, p. 13), they must permit, even encourage, the students in the transitional stage, prior to becoming full academic community participants (Lave & Wenger, 1991) or mature academic writers, to imitate or copy their language to a certain extent with the intention to learn.

7.2.2 Reconceptualizing Legitimate Language Reuse

The arguments I have made above indicate that in formulating theories about L2 writing in scientific and engineering disciplines we must recognize the nature of such writing, which is intertextuality (Currie, 1998). This means that each written text in such disciplines, and other disciplines too, forms a link in the chain of written communication. It is "forged dialogically in response to the already written" (Dillon, 1988, p. 71) and contains many "*half-concealed or completely concealed words of others* with varying degrees of foreignness" (Bakhtin, 1986, p. 93; emphasis added). As well, as Bakhtin suggests, the text also anticipates possible responsive reactions from the reader. Thus the texts mutually reflect one another. In this way, science and technology writers depend on each other for ideas and words in writing up their own research texts. Further, we must recognize the nature of writing disciplinary assignments by developing ESL students, which is using others' words and/or ideas, even though they may create ideas out of their own minds and research. Patchwriting, one way to use others' ideas and/or words, is not only a practice we as academic writers all engage in at different times to varying degrees, but also a positive textual strategy that is essential for students to learn, display, and react to knowledge. It enables ESL students to write the kind of discourse that is valued by the academic community. As ESL students develop in their writing skills, they may vary in the style and extent to which they practice this strategy. Meanwhile we must acknowledge the impossibility of citing the sources of all the words and ideas which they have learned (see also Steward, 1991, for similar comments).

Given these understandings, we can reconceptualize justified copying or language reuse as a textual strategy in the development of the natural process of ESL students learning to express their ideas by using the language and knowledge they have learned in their disciplines (cf. Currie, 1998). This strategy is especially important for ESL students in the developing stage prior to becoming mature writers when they can think more freely in academic English and depend less on using others' words directly. If the theoretical understandings are correct, they would be able to inform rules imposed from outside but intended to govern the practice of assignment writing by developing ESL students in scientific and engineering disciplines. As Myers (1998) rightly points out, this does not suggest the adoption of anarchy whereby students can randomly copy source texts in any way they wish or as much as they wish, but rather an "order in the new order" (p. 11) whose components include ESL/EFL writers and the popular use of the computer and the Internet, among others. This order calls for a corresponding relaxation of the traditional notions and rules of plagiarism. In this "new order," language reuse such as occurs in patchwriting should be legitimized for ESL students as they learn and use knowledge from others. This does not mean that genuine plagiarism does not exist with ESL or other students. Rather, a distinction has to be made between copying large chunks of text verbatim from sources without appropriate acknowledgment and using others' words after having assimilated or learned the words and their ideas.

7.2.3 Implications for the Academic Community

In light of the developmental process of learning to write, even though ESL students could eventually develop the ability by relying mainly on themselves to write texts that are acceptable to the academic community, the process can be lengthy, strenuous, painful, and perilous. What educators, faculty, and hosting institutions can and should do is to become forces that support, not suppress, the processes of learning (Lave & Wenger, 1991), to provide opportunities for ESL student academic development. That is, ESL students should be given opportunities to explicitly learn the rules of Western writing conventions (before and after being relaxed), patterns of cognition, and attitudes to text, which Sherman (1992) calls the "cultural syllabus" (p. 197), and opportunities for developing necessary English language skills for writing. The language skills, I must emphasize, are a precondition for learning the cultural syllabus. Chinese graduate students, who have been trained to be good at following instructions, can learn much faster with clear explicit instructions than being left to "sink or swim" or being "taught" or "guided" in a fashion of "scaffolding" without much effect. I put *taught* or *guided* in quotes because some professors (e.g., some of Ning's and Ping's professors) did not teach or guide ESL students in completing their course work or graduate studies in ways that the ESL students would associate with teaching or guiding. In the case of a cross-cultural mismatch of conceptual understandings and expectations, it is not enough to expect ESL students to accommodate the professors' idiosyncratic methods of teaching; rather the professors, too, should change their methods of teaching to accommodate ESL students' learning methods and expectations. "Accommodation is a mutual process" (Kubota, 1999, p. 30; see also McKay, 1993). In their conception of legitimate peripheral participation, Lave and Wenger (1991) also envision such a process: "legitimate peripheral participation is far more than just a process of learning on the part of newcomers. It is a reciprocal relation between persons and practice" (p. 116). In this relation, masters of apprentices also change as colearners. This latter change is crucial for the transformation of the wider process.

7.3 Thinking Media and Language Switching in Thinking

In this section I analyze the findings of my study regarding the thinking media the students used while preparing to write and writing the assignments for their study programs. Thinking media refer to the media through which we think, such as language or graphics. In this discussion I focus on the medium of language only and name the switch from one language to another in order to think as language-switching (see Qi, 1998). In the analysis I relate my findings to the theories proposed in other research studies on thinking and writing by bilinguals. Particularly, these theories include propositions about separate knowledge storage and retrieval (Frielander, 1990; Paivio, 1991) and factors relating to language switching in the thinking process for writing (Qi, 1998).

Frielander (1990) hypothesized that "L2 writers will plan for their writing more effectively, write better texts containing more content, and create more effective texts when they are able to plan in the language related to the acquisition of knowledge of the topic area" (p. 112). For example, if ESL students from China who speak Chinese as their L1 are to write an English essay on a topic related to their Chinese experience, they are likely to write better essays if they use Chinese to generate and organize ideas to be included in the essay. This hypothesis is consistent with the separate stores hypothesis proposed earlier in the literature concerning bilingual memory (see Paivio, 1991). It posits that languages are stored separately in the memory if they were learned at separate times. The separately stored languages would be retrieved separately via the language of storage and can only interact with each other through translation. To test his hypothesis, Frielander studied 28 Chinese-speaking subjects at an American university.

The subjects wrote on two essay topics in both English and Chinese, one on an experience in China (*Qingming* - a traditional Chinese festival) and the other on a situation at the American university (the subject's difficulty of adapting to the new cultural and educational system of the university). His study confirmed the hypothesis. Frielander found that the subjects wrote better essays when planning in the language in which the knowledge or experience was acquired, that is, the Chinese experience in Chinese and the American experience in English. However, regardless of the language used, the subjects produced better plans and texts on the Chinese topic. One reason was that the subjects were much more ingrained in the Chinese experience than the American experience. Frielander (1990) concluded that switching to L1 to retrieve information learned in L1 in case of complex questions definitely has a positive effect on L2 writing. On this basis, he proposed that if writing in English about a topic learned in Chinese, Chinese speakers would benefit by producing a plan in Chinese and then using that plan to generate their English text. Similarly, if writing in English about a topic learned in English, these speakers would benefit by producing their plan in English. Further, they should be able to draw on a greater amount of topic area information if they write a preliminary draft in their L1 and then translate it into English. In this light, translation appears to facilitate rather than hinder the writers.

Qi (1998) reported a study examining the factors relating to language switching in the thinking process. In the study one Chinese/English bilingual (bilingual referring to a person with any proficiency level in more than one language) from China enrolled in a Master's degree program in social science at a Canadian university was asked to perform three sets of L2 composing tasks: text composition in English, written translation from Chinese to English, and problem-solving in math in English. Each set consisted of one task with low knowledge demands and another with high knowledge demands. Analysis of the think-aloud protocols and subsequent interviews with the participant found that the participant, while thinking, often switched to the language in which an idea could be most comfortably expressed - usually her L1. Then the content generated in L1 was transferred to L2 via translation. The reason was that the complexity of information required for the difficult tasks would be too much of a burden if she used her weaker language (L2) to process it. Thus, Qi concluded that high knowledge demands were a general factor for language-switching (to L1) in the thinking processes. Specifically, these factors included an implicit need to encode efficiently a non-linguistic thought in the L1 to initiate a thinking episode, a need to facilitate the development of a thought, a need to verify lexical choices by turning to the L1 to judge their appropriateness, and a need to avoid overloading the working memory which may result from attempts to process much complex information in L2 in limited time.

The study (Qi, 1998) further claimed that

> the effectiveness of language–switching provides important evidence supporting the notion that conceptual knowledge is shared across L1 and L2 and may be accessed cross-linguistically without the risk of affecting the quality at a conceptual processing level. In other words, knowledge may well be tied to a shared rather than a separate conceptual store in a bilingual's memory. (p. 429)

This claim agrees with Cummins' (1984) knowledge interdependency hypothesis which indicates that knowledge may be directly accessible in either of the two languages of a bilingual, but disagrees with the separate stores theory supported by Frielander (1990) described above. I think Qi's claim is valid to a certain extent if the knowledge demand is very low for the bilingual. That is, conceptual knowledge is shared across L1 and L2 if the bilingual can comfortably express the knowledge in both languages, such as in the case of a task with low knowledge demands. However, if the bilingual is unable to express the knowledge comfortably (i.e., freely) in both languages, or has to constantly rely on a bilingual dictionary to translate the knowledge from one language to the other, it may be hard to claim that the person can access the knowledge via L1 or L2 without affecting the quality at a conceptual processing level. For instance, in my study, Ying was studying audiology and speech pathology at UBC but had almost no educational or professional experience in Chinese in this area. Therefore, she seldom used Chinese, her L1, in thinking about her disciplinary writing since that would cause her discomfort. I return to this discussion in 7.3.3 below with data from my interviews.

What Qi (1998) and Frielander (1990) seem to agree upon is their recommendation of using L1 and translation in performing complex writings. Both of them thought that switching to L1 and translating content generated in L1 may facilitate rather than inhibit L2 composing processes, though Qi approached the issue from the perspective of knowledge demands while Frielander did it from the perspective of the language of knowledge/experience acquisition. Thus they think it would be misleading to advise our L2 students to refrain from using their L1 in L2 writing. However, sound advice will need to be based on the student's L2 proficiency as well; that is, how comfortable the student feels in thinking in L2 for the specific writing task or task component in question.

In the rest of this section, by analyzing my students' thinking media and relating them to these theories, I offer an interpretation which I think can better account for a greater variety of situations involving thinking media by bilinguals. For the purpose of this discussion, I divide my students into four relatively distinct categories: 1) similar L1 and L2 disciplinary fields (I), 2) loosely related L1 and L2 disciplinary fields, 3) entirely different L1 and L2 disciplinary fields, and 4) similar L1 and L2 disciplinary fields (II). The difference between groups (1) and (4) is that the former group generally had underdeveloped knowledge in both language and content, whereas the latter group was highly developed in both language and content. I first recapitulate their thinking media on the basis of the categories and then see how they can be used to support or improve the above theories.

7.3.1 Similar L1 and L2 Disciplinary Fields (I)

Category 1 includes those students who studied in an area at UBC which was closely related to what they had done in China and who had been at UBC for only a short time, that is, six months to two years. Due to their fairly short stay in Canada and science and engineering backgrounds, their English proficiency was generally underdeveloped. These students include Ming, Ting, Feng, Ling, Ping, Qing, Wang, Xing, Bing, and Hang. They often thought in English while reading English texts. However, because their English was not very strong in contrast to Chinese, their L1, they had to use Chinese and their Chinese background knowledge to process and retain the information learned from English sources. This difference between the language of knowledge input and that of knowledge storage can be revealed in my interview with Ping:

> J: But how come here you said you translate into Chinese in order to memorize it.
> P: Because when I reading, I just got the concepts. But I cannot get the exactly way, the whole way to express the concepts in English. So if I try to remember the whole thing, I cannot do so in English.
> J: So it seems that while you are doing readings, you think in English. But after you finish the article, then you come and sit back to process the information in Chinese?
> P: Yes.
> J: Why do you do so?
> P: The reason is - I have mentioned.
> J: This part I know: You read English, you think in English. How come you got the second part?
> P: Because the second part - I cannot think always in English. I can not. That's the reason. If I can, I don't bother to translate between Chinese and English. That's the reason. But when I was reading, I can't [think in Chinese] because everything has been written here [in English]. I just get. But I cannot process myself all in English. That's the problem.
> J: What's the difficulty?
> P: I think there are two difficulties. One is habit. I'm used to doing so. The second is there are some problem because I cannot remember exactly how such meanings are expressed in English. I cannot do it all by myself. And also it's not convenient for me. You know people like to do things if possible.
> J: So it's easier for you to process it or bank it, keep it in Chinese. You have a more solid memory if you keep it in Chinese. If you keep it in English, you may lose it.
> P: Yes.
> J: Is it because you cannot relate to your Chinese background?
> P: It's part of the reason.
> (Interview with Ping, Nov. 29, 97)

As evident, if Ping tried to store new concepts in English, the concepts might be quickly forgotten for lack of an English storage system to attach them to since he (and most of the other students in this category) had not firmly established a strong English storage system. Ting's complaint to a similar effect provides further illustration:

> When I listened in class, I felt I understood (the professor). But after class I forgot everything. I don't have anything in my memory. This lack of memory suggests I was listening at the level of an elementary school student to the lectures of professors. (Aug. 27, 97)

It is not that Ting completely failed to understand what the professor said in English; rather he was unable to remember what he heard - without having the opportunity to translate the English information into Chinese.

When these students planned for writing, that is, generated and organized ideas, they mostly thought in Chinese though they might jot down notes in English phrases and sentences since they were to write English assignments. They seldom wrote their outlines entirely in Chinese, though, against what Frielander (1990) advised (even if they doubtless employed their disciplinary knowledge learned in Chinese). Most of these students (that is, except Xing; see below) continued to use Chinese for thinking for much of the writing by accessing and retrieving information from their Chinese memory and meantime relying on their Chinese thinking skills. So their writing involved translation and then thinking in English. The latter process seemed to vary with the individual students. For example, Xing, who had a relatively high English proficiency, might be thinking in English more than Hang, who was still practicing translation in order to improve his disciplinary writing skills. Compare:

> J: In what language do you normally think about your writing?
> X: English.
> J: Do you use any code switching between languages (jumping from one to the other)? If

> so, in which direction? Under what circumstances do you switch?
> X: I usually think in English. But sometimes I do it in Chinese especially if it is a difficult concept.
> (Interview with Xing, Nov. 18, 97)
>
> J: In what language do you normally think about your writing?
> H: I think I still use Chinese. For some topic if I'm very familiar maybe I just write in English.
> J: I see. Your thinking in Chinese would be true for outline as well as for the writing of the paper itself?
> H: I think the same.
> (Interview with Hang, Dec. 5, 97)

As can be seen, Xing thought in English in normal cases and in Chinese only in case of difficult concepts. In contrast, Hang usually thought in Chinese. Only when the content was very familiar did he think in English.

The amount of thinking in Chinese also varied relative to the sources from which these students first obtained the information. If the information came from their own laboratory experiments, field trips, or some other hands-on experiences, namely, obtained first hand, Chinese would likely be the language because they were thinking in Chinese, their own language (see section 7.2), in performing the experiments. Feng offered some reasons why he used Chinese for his research in the following.

> F: When I read English articles, think in English. When I read Chinese articles, think in Chinese. But after that, I think in Chinese. After reading, because you get some information here, so you think about some information and try to look for, dig out some important information and come back to your research program, and design your experiment. All this process is in Chinese, thinking.
> J: Therefore after you read an English article, you have to process that information to see which part is useful for your research, and which can be incorporated into your bank of knowledge.
> F: Not really. Because sometimes you read an article, only for report, like you give a presentation. In this case you don't need to translate into Chinese. You just think in English and talk with English. That's fine. But if you want to dig out some important information and try to design some experiments related to your research work, in this case, yes, in Chinese.
> J: That means when you do your research work, most of the thinking, the processing, is done in Chinese.
> F: Yeah.

> J: That's why you come back to Chinese. It makes sense. Why do you use Chinese when doing research?
> F: I think it's faster to get idea. Get new idea is very fast. I think maybe so many years you used Chinese, especially calculations. When you use Chinese, very fast.
> J: True. Your English is not so fluent as Chinese for that purpose.
> (Interview with Feng, Nov. 19. 97)

Feng used Chinese in research experiments because Chinese clearly was his much stronger and more efficient language and also it would be much easier for him to "dig out" needed information to generate new ideas, suggesting that the information he retrieved was probably stored in his Chinese memory. This supports Frielander's (1990) argument that the knowledge or experience acquired in L1 or L2 would be best retrieved via the same language. What is noteworthy about my students is that they took in and stored the information in Chinese even if they were in Canada. On the other hand, if they obtained the information from English sources, that is, second hand, they might think in English and keep the information in short term English memory in order to use the information to write English texts such as reports and literature reviews (as Feng did). Even if the students tried to comprehend English sources in English, they still had to resort to translation to Chinese in order to understand difficult concepts. They even had to translate the concepts to Chinese in order to store them in long term memory (see above). Pennington and Zhang (1993) in a survey of Chinese graduate students at a U.S. university too found that the majority of the students thought in Chinese to some extent while writing in English. Myers' (1998) Chinese graduate students echoed the same practice. This practice may change, however, if the students gradually build up a strong English storage system, as we see in 7.3.4.

7.3.2 Loosely Related L1 and L2 Fields

Kang, Ding, and Ning, making up category 2, switched from their fields of study in China to new fields which were only loosely connected with their previous studies. But since their

English was not very strong in contrast to their very solid Chinese academic background and they were normally thinking in Chinese, they thought mainly in Chinese in reading in the beginning but moved much more quickly than most of those in category 1 to thinking more in English because they did not have a similar specialized knowledge in L1 to turn to. For example,

> J: When you read academic writing (e.g., an article in your field), do you normally think in English or Chinese?
> K: Guess now I think in English, 'cause there are many academic terms in my paper (of which I do not know the Chinese for).
> (Interview with Kang, Nov. 22, 97)

But when Kang met difficult sentences, he would come to his mother culture to get a sense about the sentence and then continue with the reading.

> J: So you use code-switching from Chinese to English. Do you go backwards from English to Chinese?
> K: Yeah, if I met some tough sentence, I really can't find the exact meaning to explain that in English, so I will come back to my mother language, because when you understand some sentence, you have to use your cultural background to understand that. I think you must have such experience, right?
> J: Sometimes I do.
> K: So you have to come back to your mother culture background and get a sense about that, and go back and you understand what this is in this English environment, what's the meaning for that.
> (Interview with Kang, Nov. 22, 97)

However, they used mainly Chinese for thinking during the planning process for writing because Chinese was still their stronger language. It was easier and more efficient to generate ideas and then organize them.

> D: When I write, I usually do an outline. Usually for the outline I think in Chinese. But when I do the writing I try to think in English.
> J: Why use Chinese for the outline?
> D: I think it's pretty easy, because I always think that's for outline, just know the whole things. It doesn't matter. It won't affect your writing. It's easier and quickly to think about it.
> J: So why do you switch to English in the actual writing of the paper?
> D: I don't know because at the beginning when I first write a paper in English, I think for

> me it's difficult. So usually I read lots, lots of papers. So it's like a format (model). So when I write this, if I read many papers, it's like a format (model). When I think I'm going to write in this sentence, just English come first, not Chinese.
> (Interview with Ding, Dec. 29, 97)

While writing, whenever they came to difficult concepts to process or complex ideas to analyze, they would still come back to Chinese. For example, Ding would think in Chinese first and then think about it again in English.

> But what I mean is if what I did is too complicated to use English to express, so you use Chinese to think about. When you think it through, so you just use English to think this again. (Dec. 29, 97)

It is probably because their Chinese culture supplied them with the logic skills, in addition to basic knowledge, necessary for generating ideas and getting their thinking going. This finding is in keeping with Qi's (1998) claim that high knowledge demands were a general factor for language-switching (to L1) in the thinking processes and that L1 students should use their L1 to plan for complicated writing tasks.

Worth noting is that it is this group of the participants who relied on copying and modified copying most either through note-taking and information collection on the computer (Ning and Kang) or through memory (Ding). Since they had shifted to a fairly new area, they had no closely related specific disciplinary knowledge from their Chinese education to access. The Chinese education and culture could only provide them with a broad knowledge base and thinking skills, which they exploited on demand. Their specific disciplinary knowledge must come chiefly from the English sources they had just read or accessed otherwise (such as through lectures). Yet their English was not strong enough, at least in the beginning, to accommodate the storage of the entire English knowledge they learned. Thus they had to reprocess a portion of the English knowledge and store it in Chinese while keeping the rest (such as technical terms) in English. The former was evident in that the participants often used Chinese to generate ideas in planning and sometimes during writing. In the latter case, they had to rely on the computer considerably to help store the English knowledge, again reflecting their underdeveloped disciplinary knowledge as well as English proficiency. Therefore, when they wrote their disciplinary assignments in English, they were writing using "unfamiliar discourse" (Howard, 1995; Hull & Rose, 1989) in terms of both content and language (see section 7.2). Also, in this respect, it would be only partially right to assert that these students had an interdependent language system since while one portion of their knowledge was readily accessible via both L1 and L2, the other was only accessible via L2.

7.3.3 Entirely Different L1 and L2 Fields

Similar to Kang, Ning, and Ding, Ying, who constitutes category 3, was also studying in a new area, shifting from English language and literature in China to audiology and speech pathology at UBC. She shared the challenge of learning new specific disciplinary knowledge and using it in written assignments. But unlike the other three students, Ying as a former English major had the critical advantage of a developed English proficiency. Therefore, she was able to learn English knowledge from the sources and use her English which was strong enough to accommodate the storage of the knowledge in English. Thus, when she accessed and retrieved the knowledge for thinking and writing, she did so in the same language, namely English. Furthermore, also owing to her strong English and experience in using English, she was able to use her logic skills in English. Thus her whole process of thinking and writing for the purpose of the assignments was predominantly in the English medium. As an evidence of proof, she found it difficult to explain her studies to Chinese speakers in Chinese because then she had to translate everything to Chinese, which she was not used to and which would involve terms she did not know the Chinese equivalents of.

> J: In what language do you normally think about your writing?
> Y: English.
> J: All the time from planning to proofreading?
> Y: Yeah.
> J: Why don't you use Chinese?
> Y: I don't know how Chinese - it's hard to translate and back. Just all the readings are English. All the terminology are English. I don't have a background in this area in Chinese.
> ...
> J: You said sometimes you switch from Chinese to English.
> Y: When I talk to Chinese people but –
> J: - why do you do so?
> Y: It's faster. It's something you don't have to...I think it's vocabulary in Chinese - sometimes it's limited.
> J: Or you don't know.
> Y: You don't know. You just don't think readily what's the Chinese proper translation for the English words.
> (Interview with Ying, Nov. 24, 97)

As is obvious, Ying had a preference for thinking in English, her stronger and faster language as far as her discipline is concerned. This is in sharp contract to most of the students in category 1. My own experience as a bilingual writer supports Ying's evidence in that I always think in English during both planning and composing stages of disciplinary writing since all my academic knowledge has been acquired in English for the past many years. It must be admitted that as adult ESL students the English we use for thinking may be still called a variety of "interlanguage" (i.e., the internal system of the target language constructed by a learner at a given point in time; see Selinker, 1972) rather than the same language as that of many native English speakers. Ying's experience provides further evidence for Frielander's claim that knowledge acquired in a certain language would be best accessed in that language, and counter evidence for the claim that the knowledge of a bilingual can be readily accessible via either L1 or L2 (Cummins, 1984; Qi, 1998).

7.3.4 Similar L1 and L2 Fields (II)

A special case was Zong, who I call category 4. Like the participants in category 1, he had roughly the same field of study at UBC as his in China. So it can be said that he had a good background knowledge from his Chinese education of wood science. But unlike those in category 1, he enjoyed a highly developed level of both disciplinary knowledge and English language proficiency. By the time of the interview he had completed his PhD studies and had been working at high-profiled research institutions in an almost entirely English environment as a promising scientist. Thus Zong can be said to have a solid knowledge of his discipline in English. In that environment, even if he talked to another Chinese L1 speaker, he would speak English. He told me:

> I have some Chinese people in our group. I find it's hard to talk to them in Chinese because you are in this English environment. Naturally you become accustomed to speaking English. (April 8, 98)

His English was so developed that when he now planned for writing and composed research texts, he thought in English all the time. But at the beginning when he put his first couple of articles together, he had to write in Chinese first and then translate it to English, similar to what Hang did sometimes.

> J: When you write, do you think in English?
> Z: English.
> J: At the planning stage, do you use English?
> Z: Yeah.
> J: In the beginning did you do this?
> Z: Let me see. No, I had a lot of difficulties at the beginning. I probably, when I put the first couple of journal articles together, put Chinese first, then translate.
> (Interview with Zong, April 8, 98)

The progress Zong made in thinking in English did not occur overnight but through many years of exposure to English, both oral and written, an eagerness to learn what he considered to be good language, and tremendous English practice in applying what he learned. He reflected:

> I found...it's such a learning curve. You really can't pick one thing - that's the way I got to a different level. It's a process. So I think I pay a lot of attention to how other people write. Sometimes I even stop and think: hey, if I write this sentence it would be different, why. I would admire people who write well. Gradually you learn the way the native people would express themselves.
> (Zong, April 8, 98)

Zong's case demonstrates a superb example of development over many years from thinking and writing in Chinese to be translated into English to thinking and writing directly in English. In the process, his stronger language for English academic writing shifted from L1 to L2. But on the other hand, since he had a strong knowledge background of wood science in both Chinese and English, it is likely that he had an interdependent knowledge storage to a greater extent than any of the other students in that he might be able to access much of his disciplinary knowledge via both L1 and L2.

7.3.5 Discussion

Frielander (1990) hypothesized that "ESL writers will be able to plan more effectively and produce texts with better content when they are able to plan in the language related to the acquisition of topic-areas knowledge" (p. 113). In my study the findings for case category 3 strongly support his hypothesis. However, the cases in categories 1 and 2 are more complicated. Some of the members in category 1 were so used to thinking in Chinese, especially with regard to difficult concepts, that they would reprocess their English texts and integrate the knowledge gained in the texts with the knowledge they had learned in China in order to store the knowledge in Chinese in long term memory. Wang was one of them.

> J: So while you read, it's in English. After you read, you process it in Chinese.
> W: I think so.
> J: Because you want to relate to something you learned before.
> W: Most probably in Chinese. I think only when you say in your mind in Chinese, 'OK, I understand,' then you are really understand about this paragraph. And if in your mind your Chinese is totally a mess, then you really don't get the point.
> (Interview with Wang, Dec. 5, 97)

Therefore, while planning to write their papers, most of the students in category 1 thought in Chinese as they retrieved the information stored in their Chinese memory. The students in category 2 (such as Ding) still often thought in Chinese while planning for writing in English even though they received their knowledge input in L2 and they had little corresponding L1 disciplinary knowledge from China. But these students did think more in English than most of those in category 1 while producing the texts. Thus it appears difficult for Frielander's hypothesis to account for these complexities.

However, an alternative theory proposed by Qi (1998) based on cognitive demands seems to fall well into place. That is, if the task is complex and demands a high level of knowledge, the students tend to use their L1, namely their stronger language, for thinking. This occurred in cases such as Kang in breaking his reading blocks and Ding in breaking his writing blocks. But if the task is not cognitively demanding relative to both the students' disciplinary knowledge and language proficiency, such as giving advice to the international student advisor on how to meet the needs of international students in Frielander's study, then the students may think in English in planning for and writing English texts.

As can be discerned from above, a significant factor which determined whether the students were able to store the knowledge learned in English in their memory in English was the student's English language proficiency, namely, whether the students had a strong enough English language to support the storage of the English knowledge. For example, while Ying kept her

English knowledge in mind in English without much difficulty, most students in categories 1 and 2 found it not easy to mentally remember the knowledge in English. As Ping stated, it is not that he did not want to think in English to reprocess the information he just read; he wanted to but was not able to. So he automatically fell back on his Chinese memory system.

> J: But how come here you said you translate into Chinese in order to memorize it?
> P: Because when I reading, I just got the concepts. But I cannot get the exactly way, the whole way to express the concepts in English. So if I try to remember the whole thing, I cannot do so in English.
> J: So it seems that while you are doing readings, you think in English. But after you finish the article, then you come and sit back to process the information in Chinese?
> P: Yes.
> J: Why do you do so?
> ...
> P: Because the second part - I cannot think always in English. I can not. That's the reason.
> (Interview with Ping, Nov. 29, 97)

Nonetheless, as he continued to use English in his studies, he began to think more and more in English in writing as well as reading. In this respect, Zong, from category 4, was similar.

> J: When you read articles you would think in English?
> Z: I never analyzed it in a definite fashion. I think now when I talk to you, I don't think of anything in Chinese.
> J: What about reading?
> Z: I would say more in English than Chinese. Something -
> J: - not clearly cut?
> Z: Something you would develop over the years.
> J: Perhaps at the beginning you probably thought more in Chinese, as time goes on, you think more in English.
> Z: I think so...
> (Interview with Zong, April, 8, 98)

Thus, it is worth reiterating that the development of students' English language proficiency is a gradual process. As their English proficiency develops, they will be able to think more and more in English for both reading and writing.

The case of Zong also supports Qi's (1998) claim, which agrees with Cummins' (1984) language interdependency theory, that ESL students have an interdependent storage system of conceptual knowledge in their memory. That is, conceptual knowledge is shared across languages and can be accessed via both L1 and L2. In Zong's case, for some knowledge which he had learned in China and which he learned again or reprocessed in Canada, Zong might have an interdependent storage system that could be accessed through either English or Chinese without much difficulty. However, my study findings in general suggest that whether conceptual knowledge is shared across languages also depends on at least two other factors that are interrelated: cognitive demands of the knowledge and L2 proficiency. If the knowledge is not cognitively very difficult and the student has L1 and L2 both of which are sufficient for the student to process the knowledge comfortably, then the knowledge may be shared across languages and accessible via either language. An excerpt from my interview with Hang supports this claim:

> J: But do you find it hard to translate? The thing is if you think in Chinese, and you have to write in English, there must be a process of translation going on.
> H: Yeah. But if the topic is familiar, English and Chinese are the same. But if some topic is very difficult, maybe I think in Chinese.
> (Interview with Hang, Dec. 15, 97)

This same illustration simultaneously supports a counter claim that if the knowledge is too difficult or complex for the student to process in one language, then the student may be able to process it only in the other, rather than either of the two. In my study English was the weaker language for most of my students; therefore they normally resorted to Chinese, their stronger language, to process difficult knowledge. Such examples were abundant in my interviews with the students especially in category 1. Here is one of them:

> P: ...But I cannot process myself all in English. That's the problem.
> J: What's the difficulty?
> P: I think there are two difficulties. One is habit. I'm used to doing so. The second is there are some problem because I cannot remember exactly how such meanings are expressed in English. I cannot do it all by myself. And also it's not convenient for me. You know people like to do things if possible.

(Interview with Ping, Nov. 29, 97)

On the other hand, Ying learned her conceptual knowledge in audiology and speech pathology in English and had had almost no opportunity to reprocess the knowledge in Chinese. Therefore, she stored the knowledge only in her English memory and retrieved the information in the same language. She did not have a Chinese memory for the conceptual knowledge. Though as a Chinese L1 speaker, Chinese might be her stronger language for life and social topics, in the realm of her scientific discipline, English was obviously her stronger language (see 7.3.3 above for interview data). The reason why the students preferred to use the stronger language to process complex knowledge is that the knowledge complexity or difficulty would be too much of a burden or an obstacle for the participant if s/he used the weaker language to process the knowledge.

Qi (1998) in his study of one Chinese graduate student at a Canadian university found similar observations from his participant. However, Qi (1998) overgeneralized his case study findings. Qi argued that since his participant depended on her L1 to complete composing tasks of high knowledge demands, "it would be extremely misleading to advise our L2 students to refrain from using their L1 in L2 performance" (p. 429). I argue that whether we should encourage ESL students to think in L1 or L2 depends to a large extent on how proficient the students are in the L2 relative to the subject matter. If the proficiency level of the L2, in this case disciplinary L2, of the ESL student, is fairly low, then in accordance with the research findings we should encourage the ESL student to think in L1 especially in performing difficult tasks, rather than asking the ESL student to think in L2. But on the other hand, if the L2 proficiency level of the student is high relative to the task to be performed, and the student would feel quite comfortable or even more so thinking in English, then it would be unwise to encourage the student to still think in L1 rather than in L2, which the writing is supposed to assume. The case of Ying discussed above provides a strong evidence for this claim.

Thinking in L1 before or during L2 writing, while helpful in generating ideas and straightening thoughts, is inevitably bound by the constraints of translation and accompanied by problems which at least partially resulted from L1 influence and writing through translation. The problems manifested in the works of my student participants or admitted by the participants include absence of required articles (e.g., "have only slight effect"), misuse of prepositions (e.g., "in nowadays"), subject-verb disagreement (e.g., "Biotic system require..."), unidiomatic use of words (e.g., "...is got"), run-on sentences (e.g., "However, the hot pressing method was not used until later research, since a big difference expected in density profile in thickness between the cold pressing boards and hot pressing boards, the use of cold pressing data to predict flakeboard properties is questionable."), use of Chinese formats (e.g., "I. Introduction:"), and what has often been termed "Chinese English," or literal translation (e.g., "So far, the only study on fractal dimension directly applied to wood exists (Brown, Smith 1994)."[9]). (See Appendices H, I, K, M, and N for more texts containing these and other problems.)

Further, while translation may be a positive writing strategy for a developing student, it will phase out as the student matures in writing in English. Thus there is presumably a thinking medium continuum along which the use of translation varies. This observation is consistent with Lay's (1982) argument that L1 is more useful in the beginning stages of L2 development and as L2 develops, L1 use would lessen. Further support is evident in the developmental view of bilingual memory organization (de Groot & Hoeks, 1995), which suggests that L2 learners start to process L2 via L1 (i.e., translation), but with L2 practice, develop the direct connections between L2 word-form representations and conceptual memory common to both L1 and L2 words. But, with advanced L2 proficiency, the L1 word-form associations will gradually pass into disuse, giving way to the use of direct L2 word-form associations. One of my participants, Zong, provides vivid exemplification of this developmental process, which I call *the thinking media continuum*. In other words, *L2 students start by thinking of L2 in L1 (often through translation), and as the L2 develops, gradually think more in L2 and less in L1, and finally, come to think of L2 mainly or even entirely in L2.*

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[9] The names of the two quoted authors have been changed to preserve anonymity.

Thus, whether one thinks in L1 or L2 when reading or writing in the L2 may not depend on one factor or other in a fixed fashion as proposed in earlier studies (Frielander, 1990; Qi, 1998), but rather on the interplay among a number of factors which include, but certainly are not limited to, the language of knowledge input, the language of knowledge acquisition (Frielander, 1990) or storage, development of L2 proficiency (de Groot & Hoeks, 1995; Lay, 1982), and the level of knowledge demands (Qi, 1998). It is the interplay among these (and possibly other) factors that determines the user's choice of the thinking medium for a particular writing task, or a task component which can be as big as writing up the whole piece and as small as searching for a desired word. It is worth pointing out that as already implied, the thinking medium may be switched back and forth as required during reading, planning for writing, and especially the process of writing proper.

The findings above as a whole have important implications for teaching L2 writing, education of ESL students in their disciplines, and assessment of L2 writing, both general and academic. ESL educators and disciplinary instructors may need to encourage ESL students who have just arrived with an underdeveloped L2 proficiency, to feel free to think more in their L1 and use translation to generate content for writing and keep writing going. Translation can be a valuable strategy at the initial stage of the students' studies. Further, these students should be permitted, wherever possible, to choose writing topics related to their L1 education and working experience, especially in the beginning, rather than forced to write on a topic solely of the instructor's interest (as occurred in Ting's case). The latter situation might find the student uninterested, incompetent, disempowered, and unmotivated. But for L2 students with advanced

L2 proficiency, particularly after they have studied in the English-speaking institution for several years, we should certainly encourage them to think more in English, if they can, in order to produce L2 texts as close as possible to the writing by professional NES writers. Thus, their writings may receive better appreciation from their instructors and other evaluators and stand a better chance of acceptance by academic publishers. In this respect, Zong and Ying were good examples.

ESL educators and disciplinary instructors need to tell ESL students not to be disappointed if they fail to produce satisfactory writing. The students should know that learning to write well in English is a process: it takes time. But they must keep up the practice. With sound guidance and an eagerness to learn, the students will eventually be able to produce native-like texts.

With an understanding of the findings, particularly the fact that translation can be an inevitable but positive strategy for ESL students with low English proficiency, disciplinary instructors might need to tolerate the writings of the students in their assessment to a certain extent, especially in terms of rhetoric (i.e., good sentence structures). But in the meantime these instructors can offer constructive guidance by providing written feedback and also ideally, face-to-face conferences, to explain what is more desirable, how to improve, and why, without disrespect for the students, their thinking, or their writing. The reason is that many ESL students (e.g., Ping) simply are not aware that they have made mistakes or followed inappropriate formal conventions; nor do they know HOW to improve. Ideally, the instructors should have some understanding of both the native language and culture of the ESL students and of the English language and North American academic culture in order to offer effective guidance. This understanding can be achieved through faculty development as part of the initiative of internationalization. If ESL students write poor academic texts, university faculty should have a responsibility to educate them.

7.4 Summary

In this chapter I have applied the schema theory developed by Carrell and others to examine how writing was connected to reading from the perspectives of my student participants. I found that the students obtained linguistic, content, and formal schemas from their readings and restructured their prior schemas in order to write their assignments. However, since the students had much more difficulty making their sentences flow than deciding on the overall paper structure, I have distinguished micro- and macro-level formal schemas to make Carrell's formal schema more meaningful.

Plagiarism has been found quite common among ESL/EFL university students writing English academic assignments (Decker, 1994; Shaw & Crocker, 1998; Sherman, 1992), and yet it continues to be highly controversial not only across cultures (Pennycook, 1996b; Scollon, 1995; Sherman, 1992) but also in ESL writing research (Currie, 1998; Howard, 1995, 1999; Myers, 1998; Pennycook, 1996b). By relying on the research, discourse theories (e.g., Bakhtin, 1986), and my own study findings, I have challenged the traditional notion of plagiarism on the grounds of the nature of writing using others' language, the nature of writing text-responsible assignments in scientific and engineering disciplines, and the value of patchwriting for academic discourse writers. It appears that copying from sources to a certain extent is inevitable for ESL students writing disciplinary texts, especially when they are in the developing stage, that is, the stage of learning to write in English. However, as they become more mature disciplinary writers, they would be able to write like professional NES writers eventually. These findings confirm the observations and theoretical claims made by other researchers, such as Currie (1998), Howard (1999), Myers (1998), and especially, Pennycook (1996b), on ESL/EFL students' use of others' words in L2 writing. My study also found that opportunities must be provided for developing ESL students not only to learn the Western writing convention and thinking skills necessary for disciplinary writing but also acquire general English language proficiency. The students in my study were afraid to be left to "sink or swim." They were eager for opportunities such as writing conferences and English classes which offered explicit interactive teaching. The general English proficiency was essential in enabling the students to produce mature writing, free from linguistic errors.

Finally, Frielander (1990) claimed that an L2 speaker normally accessed his/her knowledge in the language in which the knowledge was acquired, and Qi (1998) maintained that an L2 writer's choice of language for thinking depended on the level of knowledge demands of the given writing task. While their conclusions were valid on the basis of their respective empirical studies and yet limited as they each failed to consider the vast array of writers and writing situations, I have argued that it is the dynamic interplay among a number of factors such as the language of topic knowledge acquisition, development of the student's L2 proficiency, and the level of knowledge demands of the writing task or one of its components, rather than a single factor, that normally determines which language the L2 student uses for thinking in a particular situation. As suggested, the L2 student may need to switch back and forth between two or more languages or media in the course of completing the writing task. However, the general trend is that as the student improves his/her L2 disciplinary language proficiency, s/he will likely think more and more in the L2 along a continuum. I believe my theoretical propositions can account for more writing contexts than what earlier research has suggested.

In the next chapter, I will dwell further on the practical implications of the theoretical analysis. In addition, I will make further recommendations for research and education of ESL students based on my study in general.

CHARTER 8: CONCLUSIONS AND IMPLICATIONS

In this chapter I summarize the major findings, conclusions, and theoretical implications of my study. Then I discuss what implications my study has for policy and practice in terms of institutional development, particularly faculty development, curriculum development, and ESL graduate student development. Lastly, I would like to suggest questions and issues that need further research.

8.1 Conclusions

In this study I have explored the general question: How do Mainland Chinese graduate students in sciences and engineering complete the written assignments required by their academic programs, especially course assignments and research proposals? In particular, I addressed three sets of specific questions: a) What kind of written assignments must Chinese students complete? What are the faculty expectations and feedback regarding the assignments? b) How do Chinese students try to complete the assignments? c) What challenges do Chinese students encounter? The major findings and conclusions from the study are summarized as follows:

1. The Chinese students wrote various genres of assignments including weekly exercises, lab reports, project reports, literature reviews, and research proposals. Among them, project reports were the closest in format to the scientific articles published in academic journals. Some of the students also wrote proposals for their research, theses or dissertations. Most major assignments, such as project reports, literature reviews, and research proposals, were fairly flexible in that students could choose to write according to their interests; however, depending on the instructor and program, the assignments could

be rather restrictive in that the topic was prescribed or selected by the faculty. The students were generally unhappy about the restriction or imposition.

2. The faculty differed considerably across and within disciplines in their expectations on the students' written work. This finding is consistent with earlier research (Becher, 1989; Frentz, 1991; Herrington, 1985; Johns, 1990; Louis & Turner, 1991; Norton & Starfield, 1997; Prior, 1991; Steinke, 1991). However, many faculty members in the sciences seemed to have higher demands on the linguistic aspects of the students' writing, expecting it to be publishable. The engineering faculty in general did not seem to have high expectations of the formal aspects of the students' writing (except theses and dissertations). The faculty were more interested in the content. In Electrical Engineering, for example, the students were assumed to bear responsibility for their own writing since they should have mastered English prior to enrolment by demonstrating their proficiency with a minimum score of 600 on the TOEFL. Compared with the faculty in education, the faculty in sciences and engineering in general had lower expectations of formal aspects of ESL students' writing.

The science and engineering faculty expected detailed information regarding background, methods, and analysis in the students' research writing while the students were not used to providing all the details. This discrepancy could presumably be attributed to cross-cultural disciplinary differences since the Chinese students usually valued results more than the process.

3. In general, the Chinese students preferred to receive both positive and corrective faculty feedback regarding the form and content of their writing. They desired to improve their English and academic performance and continue to remain competitive. But, since

they might not be able to recognize their own problems, they needed someone else to point out and explain the problems to them and then preferably suggest alternative expressions. Yet, since English was their second language, some of them thought it unfair to tie marks closely to language errors. The students also longed for reinforcing comments on parts of the paper. Such positive feedback provided them with needed psychological nourishment, such as encouragement and motivation, for their academic growth. But unfortunately, the faculty, especially in the engineering programs, often failed to return their papers or failed to provide feedback that would help them improve their writing. Further, if faculty did not provide much feedback on their language or other formal imperfections, the students would think that the faculty did not consider language important, and therefore, would not pay close attention to the form of their writing. But depending on the nature of the problem, feedback alone might not be sufficient. Student conferences after written feedback, that is, *interactive feedback-based conferences*, were believed to be much more effective than feedback through written comments alone, which was better than no feedback at all. The Chinese students appreciated one-on-one teacher-student conferences for two reasons: the opportunity for the teacher to repeat in alternative expressions until the student acknowledged understanding; and building a closer relationship with the faculty, which showed the faculty cared and which could translate into motivation for the students.

4. When reading sources, the students were often selective by attending only to parts that best provided wanted information. If the students did not have a high English proficiency in the beginning but a strong corresponding disciplinary knowledge base in Chinese, they would most likely think in Chinese while reading English texts. Even if they started to comprehend English texts in English after studying at the university for some time, they

might still need to reprocess their English information in Chinese in order to retain the knowledge in Chinese in long term memory. However, if the students had a high English proficiency, they could both comprehend and retain English knowledge in English.

Plentiful reading could create a writing mood. In other words, reading extensively right before writing could translate into an understanding of the research topic and a fresh memory of language, structure, and style that would help in preparation. The most common approach they used to learn to write was imitating model journal articles in terms of the language and style. However, imitating, through understanding, how to write had a more permanent effect on learning how to write than imitating what to write through memory or mechanical copying.

5. When writing source-based assignments, the most typical method the students used was modified copying, or copying source sentences while making changes. This seemed to arise from taking notes of reading materials. To the students, modified copying was a way of learning to express themselves in academic English, to write like a professional writer, without being accused of plagiarism by their instructors. Since they were writing in others' language and most of their ideas were learned from others, modified copying seemed to be not only unavoidable but presumably the only practical way of learning, and in practice, it was not possible to provide all the direct and indirect language and content references.

6. As they planned the paper, the students with lower levels of English proficiency mostly thought in Chinese since their background knowledge was largely stored in Chinese and they had been used to thinking in Chinese. When they composed their papers, the students would often try to think in English, albeit slowly, as they believed that it was the right way to learn to write like native English writers. They thought in Chinese if the assignment

involved a considerable amount of mathematics or calculation, if they wrote on a complicated topic, or if they had no pressure from instructors to write good English. For the students who had no corresponding knowledge background in Chinese but a good English proficiency, they were more likely to think in English almost all the time since they retained their English knowledge in English. I called this phenomenon of retrieving knowledge retained in a certain language in the same language the *storage-retrieval phenomenon.* A more common phenomenon, however, was that instead of thinking in English or Chinese entirely when writing a paper, most of the students would use both, but often separately, switching back and forth between Chinese and English. They would switch from English to Chinese when they met conceptual difficulties or could not express their ideas in English during writing, and then either translate or switch back to English for thinking. There was *a continuum from thinking entirely in Chinese to thinking entirely in English.* The students occupied different points on the continuum at any given time. As their English skills developed, they would move from one end of the continuum toward the other, though some moved faster than others.

7. The students tended not to revise the linguistic aspects of their assignments once drafting was completed. "What is done is done," as the proverb goes. However, when the instructors or supervisors made high linguistic demands, the students would pay close attention to language.

8. The students encountered many challenges in completing their written program requirements. One of the language difficulties they initially encountered was those of technical terms in writing and speech. Another difficulty was to use varied vocabulary and sentence structure. Not surprisingly, the students' writings exhibited many problems in

grammar and vocabulary. The students' challenges in vocabulary and grammar partially resulted from their significant lack of writing practice.

9. Writing in the desired academic style and format posed challenges to the students in the beginning. Some of them were not used to providing references when quoting sources directly or indirectly. The greatest challenge for all of them was writing with good rhetoric, appropriate style, clear meaning, and a flow of language. These challenges could be attributed, in part, to linguistic and cultural differences between English and Chinese as well as a lack of detailed instructions about the assignments from some instructors.

10. The students often found challenges in managing information from readings and experiments and organizing the paper in a logical order. A different kind of organization that posed problems sometimes was to get organized mentally, or get into the writing mood, owing to difficulties in language, culture, motivation, and life.

11. A general writing challenge that seemed to concern all the students was to put their thoughts, which were often in Chinese, into accurate English words and expressions. In terms of parts of the research paper, research rationale and discussion seemed to be the most challenging as they required original sentences for original ideas and strong reasoning and arguments.

8.2 Implications for Theory

Some research has shown that interaction with native speakers that involves comprehensible input and ample opportunities for negotiation of meaning greatly enhances the L2 learner's acquisition of the target language (Angelil-Carter, 1997; Ellis, 1990; Jacob et al., 1996; Pica, 1988; Pica et al., 1987). Swain's (1985) output hypothesis further suggests that in order to develop their spoken L2 to native or native-like levels, L2 students need to produce the L2 and receive corrective feedback. Shi (1998) suggests using writing conferences to help students revise and organize their essays better. In concert with these theories and suggestions, my study (particularly Chapters 5 and 7) indicates that not just corrective feedback but interactive feedback-based conferences are considered to be of great value in helping ESL students improve their disciplinary writing in English. These conferences are best delivered by the course instructor, teaching assistant, or tutor who knows how to explain the feedback in ways that make sense to the student.

Parallel with second language acquisition (SLA) theories which distinguish language input (what meets the eyes and ears), language intake (information from language input stored in temporary memory), and interlanguage (an internalized but developmental system of linguistic rules) (see e.g., Chaudron, 1985; Ellis, 1995; Gass, 1988), my study (Chapters 5-7) suggests that with L2 students, especially those with an underdeveloped L2 proficiency, there is sometimes a difference between the language of knowledge input (e.g., English) and the language of knowledge retention or storage. In other words, though the students receive the information in English, they may have to reprocess it in Chinese (or another L1) in order to understand it and retain it in Chinese in their long-term memory. Thus, the process of reading disciplinary texts by students with an underdeveloped ESL but a developed L1 may be much more complex than that suggested by previous SLA literature and certainly more complex than the process used by native English-speaking (NES) students.

In section 7.1 I have applied Carrell's (1983, 1984a, 1984b, 1987, 1988) schema framework for reading comprehension to analyze the reading-writing relationships perceived by the Chinese students when writing source-based texts. While the concepts of linguistic, content, and formal schemas presented by Carrell are useful to describe various kinds of information the students obtained from the reading sources for the benefit of their writing, they do not give central attention to micro thinking methods, that is, the methods the students learned, or needed to learn, from the readings, or other sources, to process thinking, while writing, at the sentence level and between adjacent sentences rather than the structure of the whole paper. These methods are important because they are essential to produce sentences and texts with clear meaning, a flow of language, and the academic style and yet, they are difficult to learn and use for most ESL students, even those with a considerably high level of English proficiency like Ying.

Based on other research and theories on language reuse (e.g., Bakhtin, 1986; Currie, 1998; Howard, 1999; Myers, 1998; Pennycook, 1996b), I have challenged traditional views of language reuse and argued that intertextuality, which means that each text of a discipline forms a link in the chain of written communication in that discipline, is the nature of writing in scientific and engineering disciplines (see section 7.2). Therefore, science and technology writers depend on each other for ideas and words in writing up their own research texts, without always having to or being able to provide all the references. This is even more so with developing ESL students who lack proficient means of linguistic expression and who are learning and using the language as an L2 in addition to learning the content. So, using others' words and/or ideas can be a positive textual strategy for these students to learn, display, and react to knowledge in an academic discourse. Thus, language reuse can be reconceptualized as a textual strategy in the development of the natural process of ESL students learning to express their ideas by using the language and knowledge learned in their disciplines. In practice this reconceptualization would call for a relaxation of the traditional notions and rules of plagiarism.

Finally, while Frielander (1990) proved that knowledge in one's memory is best accessed via the language in which it is acquired and Qi (1998) maintained that whether a bilingual uses the L1 or L2 for thinking depends on the level of knowledge demands of the written task, I have argued with support of my data that it is not just the language of knowledge acquisition or the level of knowledge demands alone but rather the interplay among a number of factors such as the language of knowledge acquisition, the development of the student's L2 proficiency, and the level of knowledge demands of the writing task or one of its components that normally determines which language the L2 student uses for thinking in a particular situation (see section 7.3). More importantly, the L2 student may still need to switch back and forth between languages or media (such as graphics) in completing the writing task. In general, as the student improves his/her disciplinary L2 proficiency, s/he will likely think more and more in the L2 along a continuum with L1 at one end and L2 at the other.

8.3 Implications for Policy and Practice

In this section I discuss some of the implications of my study for the academic institution, with particular reference to UBC. In order for UBC to better accommodate an increasing number of ESL students in completing their study programs efficiently, particularly with regard to academic writing, it is imperative for the university as a whole to improve its current policies and practices. The changes involved can be identified as institutional development. I focus on three areas: faculty and faculty development, curriculum development, and ESL graduate student development.

8.3.1 Faculty and Faculty Development

As the students in my study were often frustrated about the requirements of the assignments they must write, course instructors and graduate supervisors should be held accountable for their course requirements (cf. Norton & Starfield, 1997). They need to be explicit in their requirements regarding the scope of content, format, style (such as APA), length, degree of details, and language expressions of the paper to be written. This is important and necessary especially for ESL students who have just come from another academic culture where academic assignment writing practices are widely different, such as the Chinese academic culture. Several of the students in my study such as Ning and Ping longed for explicit detailed instructions which their instructors failed to provide. Faculty who have ESL students need to have an awareness of the students' needs which might be different from what they assume to be, and adjust their teaching methods accordingly (see also Silva, 1997 for similar recommendations). Given the special values of feedback and conferences to Chinese graduate students regarding their written assignments, faculty should make all possible efforts to meet the students' needs and expectations.

However, if faculty are to participate in the explicit teaching of the writing rules of Western academe, faculty professional development is necessary across the disciplines since many faculty members do not know very well how to articulate their tacit knowledge in a way understandable to ESL students. Further, they may not be knowledgeable about the different academic cultures that their ESL students bring to the classroom. My study and Currie's (1998) study both revealed such weaknesses of some faculty members. For example, Adams, a faculty member in engineering at UBC, felt helpless in trying to assist his students.

> Written and oral communication is a big problem with many Chinese students. I have students write up to 8 or 9 drafts. Their writing just doesn't make sense to me. I don't know what's the reason. I spent a lot of time on students' drafts. (Adams, Mar. 12, 98)

On the one hand, it may be true that the students did not have good communication skills, but, on the other, Adams might have failed to explain what exactly he wanted the students to do - in a way that made sense to the students. Thus both the teacher and the students must have felt rather frustrated in their respective attempts.

My interview with Ray, another faculty member in engineering, informed me that he had very little knowledge of ESL education, such as the placement test practiced at many North

American universities, or what ESL support facilities UBC had or did not have. This suggests that we as ESL educators need to reach out - there needs to be more communication between ESL education and other academic units with ESL students whom we are supposed to serve in research or practice. Even though Ellis, a faculty member in Wood Science, was aware that there were various language schools or programs in the Lower Mainland, he did not know exactly whom those programs were for or what they taught. So when he paid for a student to learn ESL at Langara College, the student quit after one week because the program did not teach the kind of English she badly needed. Thus it is necessary to supply the interested faculty in the disciplines with some basic knowledge of ESL education and ESL services. This can be easily fulfilled through the participation in faculty development by well-informed ESL educators.

Faculty development at UBC is necessary also because UBC has recently made internationalization one of its guiding principles for development. Under this principle, UBC will enroll an increasing number of international ESL students, increasing the occurrence of the above problems encountered by the faculty.

I envision two goals for the faculty development program: 1) to raise faculty awareness of the issues facing ESL students in academic writing including the students' common language problems and the issue of cultural differences, along with other aspects of ESL students' studies; and 2) to provide the faculty with some strategies to help their ESL students respond effectively to the academic writing requirements (cf. Ferris & Tagg, 1996). The program may include having faculty share experiences with other faculty members and intercultural specialists or educators who may be able to offer explanations and suggestions for the problems. Some strategies, for example, may include providing a variety of assignment tasks, where possible, for students with a variety of cultural and professional backgrounds, clarifying values (what is expected and why it is crucial), and clarifying academic standards (Droge, 2000). It is hoped that following faculty development, the faculty members will feel less frustrated and more confident and strategic in teaching and supervising their ESL students.

8.3.2 Curriculum Development

Most academic assessments of graduate students's work are based on the students' written assignments. Some faculty in Ferris and Tagg (1996) describe writing as being more important to university ESL students than oral skills and presenting a bigger problem than oral skills. Blunt and Li's (1998) study suggests that the Chinese graduate students had more serious problems in writing and cultural skills than oral skills. The faculty and staff in my study follow-up (Adams, Ellis, Erwin, Oates, Ray, and Vivian), too, perceived their Chinese students as having great cultural problems. This is not surprising since writing is directly related to thinking, which in turn is directly related to the culture that underlies thinking. For most Mainland Chinese students, this underlying culture means the Chinese culture of Mainland China (see section 7.1 for further discussion of writing, thinking, and culture). The students in my study and Blunt and Li's (1998), however, mostly felt that speaking presented more problems than writing or cultural skills. The reason is probably that they could consult references and dictionaries and had more control over time during writing, whereas in speaking, they might have lost the control and the opportunity to consult resources. In either case, that ESL university students generally have significant problems with academic writing, culture, and speaking is undeniable.

Given that by far the majority of ESL students are not adequately prepared linguistically or culturally to undertake competently studies at an English-speaking institution such as UBC at least in the beginning, given that UBC, by joining the Canada Education Network and through various other programs, endeavors to bring in more international students who are financially advantaged enough to pay high tuition fees but who may be linguistically and academically disadvantaged, and given that many faculty members expect ESL students to meet all academic standards upon their arrival, the university, or its constituents, must provide accessible courses or programs of academic writing to help ESL students develop needed academic skills. To this end, I recommend that the university offer regular credit-bearing academic writing courses for graduate ESL students (see Hu, 1998). These courses, lasting one term but offered all year round, may include Academic Writing for Graduate ESL Students in Sciences and Engineering, Academic Writing for Graduate ESL Students in Humanities and Social Sciences, and ESL Oral Communications. Similar courses should be offered to ESL undergraduate students. If the courses are not awarded credits, ESL students who are struggling with all sorts of challenges and pressures may not take them seriously. Faculty-specific courses are more effective and motivating than "all purpose" English courses because the types of academic work students in science and engineering need to undertake are different in some respects from those in humanities and social sciences (Gilroy, 1998; Ramanathan & Kaplan, 1998). To design such courses, further needs analysis may be required by contacting teachers and students in the faculties (Gilroy, 1998).

The Writing Centre at UBC recently started offering a course, Writing for Graduate Students (posterior to the publication of my 1998 article; see below), but it only has 16 hours of instruction and requires high additional tuition. English 100 level courses and other English courses for NES undergraduate students at UBC are not designed to address the special needs of ESL students. To accommodate the offering and administration of these courses and support services, I suggest the creation of an academic development center for ESL students. Such a center is fundamental to boosting the quality of research at UBC by ESL students and the marketability of UBC's growing number of ESL graduate and undergraduate students as well as facilitating the fulfilment of its goal of internationalization (Hu, 1998; see Appendix P for the full text of my earlier article).

8.3.3 ESL Student Development

ESL graduate students need to be aware that they can request their papers back if the faculty fail to return them, ask the instructor for feedback if desired, and ask for a conference if it is difficult to understand the instructor's comments or necessary to consult with the instructor. Just as students may need to be pushed somewhat in order to produce better texts, so some faculty members may need be pushed in order to make better instructors.

As my study data show, some ESL graduate students do not pay much attention to their writing, partly because some faculty do not make high linguistic demands. If the students continue to maintain this attitude, they will likely not only encounter serious problems in the latter stages of their studies, such as writing the thesis, but more importantly, find their weak communication skills hindering their advancement in future careers. On this point, Zong had good advice:

> I think for any foreigner the biggest challenge is language. Depending on the profession, I think in our area, I think this is probably THE most important area. If you can do well in mastering the language, I think you would have a much better chance of progress in your career than somebody who is excellent in research but very poor in communication. For example in Forintek, they put communication as equally important as technical skill. (April 8, 98)

Doubtless, I cannot overemphasize the importance of mastering the dominant linguistic and cultural codes if ESL students intend to gain a voice, move up the textual hierarchy (Howard, 1999), and have access to publication opportunities, grants, and high status jobs.

8.4 Suggestions for Further Research

Since learning a second language or learning to write in a second language inevitably involves imitation, it is not always easy to distinguish learning from imitation, learning from mechanical memorization (rote learning), learning from copying, imitation from plagiarism, or learning from plagiarism. Certainly, more research needs to be continued in this direction on theoretical and pedagogical fronts. Further, research will also be needed to find out to what extent traditional rules of plagiarism should be relaxed with ESL students in the classroom, and how to teach ESL students to write for publication without being accused of plagiarism.

In order to assist or participate in the faculty development programs, we as ESL educators need to identify what the faculty in the disciplines need to know about L2 acquisition, teaching, and services so that they may better instruct or supervise graduate ESL students. This can be achieved through a survey of the target faculty members. Similarly, in order to develop academic writing courses for graduate and undergraduate students in the disciplines, it is necessary to conduct a needs analysis by contacting faculty and students, establish goals, and design appropriate materials.

The focus of this dissertation has been on the ESL students' experiences and perceptions. Though I interviewed six faculty members and one staff member, I did not give central attention to the data gathered. Therefore, I will need to write a more systematic analysis of the interview data from the faculty and staff members in a separate report.

Finally, as this dissertation has been concerned mainly with Chinese graduate ESL students writing course assignments and research proposals, further qualitative research is necessary to inquire into their thesis and dissertation writing experiences. Similar studies will also be necessary to look into the disciplinary writing experiences and perceptions of UBC ESL graduate students from other major cultural and linguistic backgrounds such as the Middle East and Eastern Europe.

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APPENDIX A

The Academic Writing of Chinese Graduate Students in Sciences and Engineering: Processes and Challenges

Informed Consent Form: Chinese Graduate Students in Sciences and Engineering

Principal Investigators: Dr. Carl Leggo, Department of Language Education, (phone: 822-4640, e-mail:leggoc@unixg.ubc.ca); Dr. Bonny Norton, Department of Language Education, UBC (phone: 822-5236, e-mail: bonny.norton@ubc.ca).

Co-Investigator: Jim Hu, PhD candidate, Center for the Studies of Curriculum and Instruction (CSCI), Faculty of Education, UBC (phone: 221-8668, fax: 822-3154, e-mail: jhu@unixg.ubc.ca). The study is for the doctoral dissertation of Jim Hu.

Purpose: At UBC, Mainland Chinese graduate students, numbered 251 as of January 1997, constitute the largest geographic group that speak English as a second language (ESL). The majority of them pursue graduate studies in sciences and engineering. These students have experienced considerable difficulties and frustrations in writing for academic purposes. Therefore, it is of extreme importance and urgency for some in-depth studies to be initiated that investigate Chinese students writing English academic assignments. For this reason Jim Hu is devoting his PhD dissertation to such a study and would also like to invite me to participate in the study. In return for my your participation, Jim will act a resource person to help me with my questions about cultural and academic adjustments as well as specific writing concerns.

Study Procedures: I understand that during September 1997 to February 1998, Jim, the co-investigator, will interview me a few times on an individual basis regarding issues related to my academic writing. The interviews will each last 30-60 minutes and will be held at Jim's office, Room 302, Education Building, at mutually convenient times. We may converse in English or Mandarin or a mixture of the two. To ensure accuracy of my subsequent interpretation, Jim may audio-tape our conversations. I may also write e-mail journals to record my experiences. There are no known physical or psychological risks associated with the research. Upon request, I may obtain a copy of the summary of the results of the study after its completion.

Confidentiality: Any information resulting from this research study will be kept strictly confidential. All documents will be identified only by code numbers and kept in a locked filing cabinet. In particular, I will be identified by a pseudonym in all reports of the study, as will be my course number, my university, and my city. Following the completion of the study, all the collected documents and materials will be destroyed.

Contact: If I have any questions or desire further information with respect to this study and the procedures described above, I may contact Dr. Carl Leggo, Dr. Bonny Norton, or Mr. Jim Hu.

If I have any concerns about my participation or rights as a study participant, I may contact the Director of Research at the University of British Columbia, Dr. Richard Spratley at 822-8598.

Consent: I understand that my participation in this study is entirely voluntary and that I may refuse to participate or withdraw from the study at any time without jeopardy to any evaluation of my study or me.

I have received a copy of the consent form for my own record.

The Academic Writing of Chinese Graduate Students in Sciences and Engineering: Processes and Challenges

I consent to participate in this study.

____
Signature

____
Name in print

____
Date

____
Phone

APPENDIX B

Background Questionnaire

1. Personal background

1.1 Name _______________

1.2 Native language (please check in appropriate bracket)

[ ]Chinese (including its dialects) [ ]Other language (specify) ____________________

1.3 Year of birth __________

1.4 Sex: [ ]male [ ]female

1.5 Time of arrival in Canada: Time to start studies at UBC:

2. Educational background

2.1 How many years did you attend the following schools?

Junior high _____

Senior high _____

2.2 a) When did you study for your *undergraduate* degree?

19 _____ to 19 _____

b) Where did you study for your *undergraduate* degree?

Name of college/institute/university ___________________________

c) What was your *undergraduate* degree major/specialization?

Degree (e.g., B.S.) ___________________________

Major ___________________________

2.3 a) When did you study for your *graduate* degree?

19_____ to 19 _____

b) Where did you study for your *graduate* degree?

Name of college/institute/university __________________________

c) What was your *graduate* degree major/specialization?

Degree (e.g., M.S.) ______________________________

Major ______________________________

2.4 Did you write a thesis for your last degree? [ ]Yes [ ]No
If yes, what was the title? (You can write in Chinese.)

2.5 a) Do you have any *domestic* publications (i.e., published in China) (including journal articles, books, and book chapters, etc)?

[ ]Yes [ ]No

If yes, please describe each publication briefly by specifying title, author or co-author, year, publication type (such as journal, book, or book chapter), language, approximate number of pages, and other related information (such as journal name in case of journal article, and winning such-and-such a prize). You may write in either English or Chinese.

b) Do you have any *international* publications (including journal articles, books, and book chapters, etc)?

[ ]Yes [ ]No

If yes, please describe each publication briefly by specifying title, author or co-author, year, publication type (such as journal, book, or book chapter), language, and other relevant information (such as journal name in case of journal article, and winning such-and-such a prize). You may write in either English or Chinese.

3. Working experience

3.1 What work positions did you have before you came to Canada? Please list all occupations since completion of undergraduate study.

e.g., Lecturer of Forestry, 1995 to 1997, Jilin University

3.2 Had you been out of China before coming to UBC?

[ ]Yes [ ]No

If yes, please describe briefly.

4. Current program

4.1 What is your current program?

Program of study (e.g., PhD in Forestry) ________________

Dept. ____________________________

4.2 What credit courses are you taking this term?

Course # (e.g., FRST 555) ___________

Title: __________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ___________

Title: __________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ___________

Title: __________________________
Name of instructor:

Writing assignments (please describe briefly):

******

Course # ___________

Title: __________________________

Name of instructor:

Writing assignments (please describe briefly):

4.3 What credit courses had you taken at UBC prior to September 1997?

Course # (e.g., FRST 544) ____________

Title: ______________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ____________

Title: ______________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ____________

Title: ______________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ____________

Title: ______________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ____________

Title: ______________________________

Name of instructor:

Writing assignments (please describe briefly):

******

Course # ____________

Title: _____________________________

Name of instructor:

Writing assignments (please describe briefly):

5. English language background

5.1 How many years did you learn English in school before receiving post-secondary education?

5.2 How long did you learn English in classes while in university?

Undergraduate: number of years ________; hours/week _________

Graduate: number of years ________; hours/week _________

5.3 What was the **primary** language of your previous study and research?

Instructors' lectures: (Bachelor's) _________ (Master's) _________

Discussion with instructors: (Bachelor's) _________ (Master's) _________

Textbooks: (Bachelor's) _________ (Master's) _________

Your writings: (Bachelor's) _________ (Master's) _________
Others (please specify) ____

5.4 What were your (highest) TOEFL scores?

Total _____

Listening comprehension ______

Grammatical structure and written expression _____

Reading comprehension _____

Test of Written English (if taken) ______

Year of the test written:

5.5 What were your (highest) GRE scores if applicable?

Total ______

Verbal _______

Quantitative ______

Analytical ______

Year of the test written:

5.6 What areas of writing in English cause problems for you? You may mark more than one area.

A: General English

[ ]None
[ ]Grammar
[ ]Idioms
[ ]Coherence (consistency of meaning)
[ ]Style (e.g., formal vs. informal; written vs. oral)
[ ]Organization (e.g., how to organize a piece of writing)
[ ]Tenses
[ ]Clear argument
[ ]Sentence structure
[ ]Sentence connection
[ ]Paragraph connection
[ ]Spelling
[ ]Vocabulary
[ ]Specific areas of vocabulary such as ________________
[ ]Words with multiple meanings
[ ]Others ____

6. Cultural and other perceptions

6.1 Please briefly describe the things that you feel *good* about since your arrival in Canada?

6.2 Please briefly describe the things that you feel *bad* about since your arrival in Canada?

APPENDIX C

Interview Guide (Students)

Written academic requirements

1. Generally, do you have a great deal of written work to do in your current program?

2. Could you please tell me what the written assignments are for each of the courses you are taking this term? How much are they worth for the particular courses? Are you working on any other written work?

3. Could you please tell me what the written assignments were for each of the courses you had taken prior to September 1997? How much were they worth for the particular courses?

4. How flexible are/were the assignments? In other words, are/were they flexible enough so that you could write according to your interests?

5. Did you have any difficulty understanding any of the assignments?

6. What did you write in each of these assignments?

Writing environment

1. Do you discuss your work with native English speaking students in your course/department? If so, how helpful is it?

2. Do you discuss your work with other Chinese students in your course/department? If so, how do such interactions enhance or hinder your academic thinking and writing?

3. Do/Did you discuss your topic or work with your course instructor? If so, how helpful is/was it?

4. Do/Did you discuss your topic or work with your supervisor if the course is taught by a faculty member other than your supervisor? If so, how helpful is/was it?

Sources

1. What kind of sources (e.g., textbooks) do you use for your topics?

2. What academic journals do you read?

3. Do you have any written sources of information about your topics, which are not in English?

4. Do you use any aids to writing like dictionaries?

5. How do you read articles or books? (e.g., Do you read all the parts in sequence or otherwise?)

6. When you read academic writing (e.g., an article in your field), do you normally think in English or Chinese?

7. Do you sometimes notice useful sentences or words in your reading and write them down? If so, how useful are they?

8. What have been the effects of your readings on your writing?

Composing

1. In what language do you normally think about your writing?

2. Why do you use this language?

3. Do you use any code switching between languages (jumping from one to the other)? If so, in which direction? Under what circumstances do you switch? Do you revert to Chinese for difficult problems/concepts?

4. How do you start writing your papers?

5. Do you write on the computer right away or do you make a hand-written draft first?

6. Do you use editing and revision in your writing? If so, how and at what stages?

7. What aspect of the paper-writing is most challenging?

8. In your opinion, how did you learn to write in English papers?

9. How do you perceive memorization as a strategy for writing?

Audience

1. Do you visualize a reader while writing?

2. Do you care about your professor's expectations?

3. How do you try to adapt yourself to those expectations?

4. What difficulties do you experience in doing so?

5. Do you use different strategies/styles for writing assignments for different courses?

Papers and feedback

1. What feedback did you receive from your professors on your papers?

2. What did you think about the feedback? Helpful, fair, etc.?

3. Did the feedback influence your writing subsequent papers?

Socio-Cultural Differences

1. How are academic requirements in your current program different from your last degree program in China?

2. According to your experience/perceptions (if applicable), what is the role or responsibility of the academic supervisor in your studies (especially in writing) in China vis-à-vis in Canada? How did that influence your writing in China and Canada respectively?

3. According to your experience and perceptions, what is the role or responsibility of the course instructor in your writing in China vis-à-vis in Canada? How did that influence your writing in China and Canada respectively?

4. How are written course assignments in your current program different from those in your previous Chinese university/institute, in terms of instructor expectations, format, organization, and conventions?

5. What did you have to do to become a successful student in China and in Canada respectively, especially in relation to academic writing?

6. According to your observation/experience/readings, how is writing academic papers in English in Canada different from that in Chinese in China, in terms of format, organization, and conventions?

7. What linguistic difficulties and conflicts have you found when writing academic papers?

8. What difficulties and conflicts have you found with cultural identity when writing the assignments? Or: What ideological and logical difficulties and conflicts have you found? What did you do to try to resolve these difficulties and conflicts?

9. Given your previous experience as __________ (e.g., university teacher), how do you feel about being a STUDENT writing papers required by your current program?

Miscellaneous

Why did you choose English, or Mandarin, or both of them, to answer my questions?
Additional comments/suggestions

APPENDIX D

Free Informal Conversation

1. Why did you choose to study in your current program at UBC?

2. What do you wish to get out of your current program experience?

3. How do you evaluate the importance of academic writing for (a) your program, (b) your future career (such as research, business, and publication)?

4. Use of languages

A) Use of English in speech: what situations, to what extent

Use of English in writing: what situations, to what extent

B) Use of Chinese in speech: what situations, to what extent

Use of Chinese in writing: what situations, to what extent

C) Their respective effects on academic writing in English.

5. How do you perceive your academic experience at UBC, positively or negatively? Supporting examples?

6. Generally, what do you think to be your difficulties/problems with respect to academic writing?

7. What more would you like the instructors and especially your supervisor(s) to do to help you with writing your academic papers?

8. What would you like UBC or your department to do to help you with academic writing and other aspects of academic studies? (Any suggestions on educational practices and policy changes re. academic writing?).

9. What would you like my research project to accomplish?

10. What advice would you like to offer to a NEW Chinese graduate student with reference to academic writing?

11. What would you suggest to China's universities to do in order to better prepare students who will need to do academic writing in North American universities?

APPENDIX E

Coding System

Themes and subthemes

1. Course Assignments [AC] and Research Proposals [RP]

Course assignments [AC]
    assignment: writing amount [AA]
    course outline [CO]
    assignment requirements [AR]
    faculty expectations [FE]
    assignment: writing type [AT]
    lab-based report [RL]
    assignment: presentation [AP]
    course assignment: grade [ACG]

Research Proposals [RP]
    research proposal [RP]
    proposal writing [PW]
    proposal defence [PD]
    comprehensive exams [ACE]
    disciplinary difference in assignments [DDA] and program requirements [PR]

Faculty feedback [FF]
    faculty feedback [FF]
    faculty feedback effect [FFE]
    faculty feedback: student perception [FFSP]
    student hopes

Writing views/perceptions [WV]

2. Study Methods [SM] -> Learning Methods [LM]

Learning methods in Canada [LMCA]
Learning methods in China [LMC]
Learning methods for speaking [LMS]

Reading method [RM]
    reading source [RS]
    reading aids [RA]
    thinking method: language: reading [TMLR]
    reading method for vocabulary [RMV]
    reading method: notation [RMN]
    reading-writing relationships [RWR]

Writing method [WM]
    learning method for writing [LMW]

- language use for writing [LUW]
- assignment difficulty: strategies to deal with [ADS]
- taking notes [WMN]
- planning/preparation [WMP]
- thinking method: language: writing [TMLW]
- translation [WMT]
- dictionary use [WMD]
- reader awareness [WMRA]
- revision [WMR]
- writing sample [WS]

- language use for speaking [LUS] and
- Presentation method [PM]
  - TA-ing [TA]
  - speaking-writing relations [SWR]
- thinking method: language: speaking [TMLS]

Study method: participant suggestions [SMPS]

Researcher-participant interaction: suggestions to participants [RPIS]

Student difference/distinction [SD]

3. The Academic Context (or context for academic studies) [CAS]

Institutional support [IS]
- university support for ESL [US]
- student perceptions on university ESL support [SPUS]
- student participant suggestions for university ESL support [PSUS]
- financial assistance/support for the students [FA]

Student-faculty relations [SFR]
- faculty support [FS]
- student-supervisor relations [SS]
- student-faculty interaction [SFI]
- socialization: language [SOL] (SO -> SOL)
- student expectation [SE]
- student hope [SH]
- number of students in a course or for a supervisor [NS]
- faculty influence [FI]
- faculty influence: effect [FIE]
- faculty difference [FD]
- disciplinary difference: student-supervisor relations [DDSS]
- student perception on faculty [SPF]
  - faculty attitude to Chinese students [NESA] (FA -> NESA)

Student-student interactions [SSI]
- peer interaction with NES and peer help [PI]
  - NES attitude to Chinese students [NESA]

- peer interaction: group meeting [PIGM]
- peer interaction with other Chinese students [PIC]
- (socialization: language [SO] -> PI, PIC, SFI)

4. Study Difficulties [STD] and Problems [STP]

Writing difficulty [WD]
- language difficulty [LD]
- style [WDS]
- idiom [LDI]
- thinking difficulty [TD]
- writing difficulty: impact [WDI]
- reason [WDR]

Speaking difficulty (i.e. language difficulty in speaking) [LDS] (language difficulty: oral [LDO] -> [LDS])
- language difficulty in oral (speaking) presentation [LDSP]
- listening (aural) difficulty [AD]
  - listening difficulty with faculty accents [ADA]

Study problems [STP]
- writing problem [WP]
  - grammar [WPG]
  - punctuation [PUN]
  - language problem: usage [LPU]
  - abbreviation [WPA]
  - language program: style [LPS]
  - writing problem: format [WPF]
  - citation [WPC]
  - plagiarism/copying [PL]
  - speed [WPS]
  - writing views/perceptions [WV]

- Speaking problem
  - oral presentation [LDSP]
  - translation in speaking [TRS]

Student needs [SN]
- student needs in writing [SNW]

5. Socio-Cultural Differences [SCD]

Students' positive experience [PE]

Cultural similarities [CS]
- cultural similarities: academic [CSA]

Cultural differences [CDE]
- cultural difference: academic [CDEA]
- cultural difference: curriculum [CDEC]

        - teaching methods in China [TMC]
        - student perceptions on teaching methods in China [SPTMC]
        - teaching methods in Canada [TMCA]
        - student perceptions on teaching methods in Canada [SPTMCA]
    - cultural difference: writing [CDEW]
    - cultural difference: assessment/evaluation (of students for a course) [CDEE]
    - cultural difference: faculty [CDEF]
    - cultural difference: student-supervisor relations [CDESS]
    - cultural difference: faculty support [CDEFS]
    - language difference [LDE]
    - cultural difficulty [CDY]
    - cultural conflict [CC]
    - cultural difference: impact [CDEI]

Social difference [SDE]
    - Chinese students' life [CSL]
    - social difference: reaction [SDER] and impact [SDEI]
    - social difficulty [SDY]

6. Identities

Identity: ethnic [IDE]

Identity: cultural [IDC]

Identity: linguistic [IDL]

Identity: social [IDS]
    - academic ID [FPIDA]
    - attitude [A]
    - motivation/investment [MI] - > [M]
    - future career [FC]

7. Methodology

Methods for interview [MI]
    - language for interview [LI]

Researcher-participant relations [RPR]

Researcher-participant interaction [RPI]

Participant suggestions for my study [PS]

8. Miscellaneous

Student perceptions on the importance of writing [SPW]

Educational background in China [EBC]

English language education in China [EEC] (LPC -> EEC)
    English language education in China: suggestions [EECS]

My own experiences and perceptions [JIM]

Test scores [TS]
Writing experience in China [WEC]
Publications and presentations in China [PPC]
Publications and presentations in Canada [PPC]
Working experience [WE]
Study-aborad status [SAS]
Teaching assistant [TA]
Future career [FC]
(Put in student profiles.)

Theory [TH]

9. Faculty Perceptions [FP]

My study [FPMS]

Program requirements [FPPR]
    admission [FPAD]
    TOEFL [FPTOEFL]
    program requirement [FPPR]
    disciplinary difference in program requirement [FPDDPR]
    number of Chinese students [FPNCS]

Strengths [FPSTR] and weaknesses of Chinese students
    Chinese students [FPCS]
    Chinese students' strengths [FPSTR] and
    strengths of Chinese students [SCS]
    faculty expectation [FPFE]
    writing style/format [FPWS]
    study difficulty [FPSD]
    cultural problem [FPCP]
    academic ID [FPIDA]
    writing problem [FPWP]
    speaking problem [FPSP]

Faculty reaction to Chinese students [FR]
    importance of writing [FPW]
    faculty support [FPFS]
    faculty feedback [FPFF]
    disciplinary difference in faculty feedback [FPDDFF]
    evaluation -> assessment of students' writing [FPWE] -> [FPWA]
    faculty advice on learning English [FPFALE]
    faculty advice on writing [FPFAW]
    university support for ESL [FPUS]

university support for ESL: faculty suggestions [FPUSFS]
faculty expectation re academic preparation in China [FPEEC]

APPENDIX F

E-Mail Excerpts from zhong_hua@cs.ubc.ca (emphasis added; edited to protect anonymity)

1. Subject: English version: Two students commit suicide in UBC
lonely (xxx@aicom.com)
Sun May 5 18:44:26 1997
...
Two Chinese Students Commit Suicide for economical pressure and loss of belonging

Within last 3 weeks, there were two students in UBC commited suicide, one is Xie Tong from Hunan in computer department, the other is Yang Ke in biochemistry department. It is really a tragedy as they are excellent students.

They have the same background, **both came from US with degrees to Canada for further development; they are all single without friends.** One cut his throat at home, the other drunk suphurous acid at lab.
Enjoy.
lonely

2. Subject: my personal feeling to these two students
lonely (xxx@aicom.com)
Tue May 7 22:08:59 1997

Sorry you feel that way which I didn't mean. what I mean is that in this world, there is no mercy or pity. also from my own experience, last time when I was nearly killed, after staying the hospital for only one week, I was kicked out with bones still broken, because the insurance company did not want to pay the bill. I vomited a lot at the time when I was dismissed from the hospital, the nurse showed no pity, she said that since you don't feel comfortable, you can stay another hour, and in 60 minutes I want to see you on your way home. and on the first day when I managed to get home, I received that "welcoming" message from my best friend. that is the last straw on a hamlet's back. I realized that the whole world is cold-blooded, as Mao said, the sky will be old if the sky has emotions. Especially I watched a recent new about an abused dog which was thrown in a garbage bin. It stayed in hospital for more than 3 months with no one paying the bill. From this example, **I found that I am not even worth than a dog. Living in such a cold world with such friend, can you expect mercy from me? as my nickname shows "lonely", I have no friends in this world, I am a lonely wolf**. If that offends you, sorry again.
lonely.

xin wrote:
>so you mean that two students deserve death? because they are weakness in life.
>they aren't the winner.
>and we 'd better not fell pity on them
>what we should do is make ourselves "strong enough" to face life, to
be a winner.
>don't care others death, especially they are loser?

3. Subject: What is your experience told you?
Wei (xxx@metaxa.wimsey.com)
Fri May 9 11:31:03 1997

Hi, Friends
Mr. Longly wrote:
"Be strong, be a winner."
"you have to get melted with this society, then you can feel some belonging to this country."

My problem is: my English is not good. I cannot melt into this society.

Everyday I feel very reluctant to join my colleagues for coffee and lunch, to listen all those things I don't know. The company use me only because my academic background and computer skill. **I don't belong to this society. Yet I know I won't go back because I don't belong to China anymore, because I choose to leave her 7 years ago. I lost between two culture.**

I have a old friend who works for a bank on Wall Street. She tried every kind of sport, watch almost every new movie. Should I follow her while I don't enjoy? Someone suggest me find a English speaking roommate. I feel hard to accept.

Hi netters, What is your suggestion? What is your experience told you? **By the way, I maybe spoiled in China but not here**. I worked as waitress, housekeeper, sewing machine operator in North American. Once I decided, I'll do no matter how hard it is. The question is what should I do? Do I have to?

Any opinion are welcomed. Thanks in head.

Sincerely,
xxx

"...that you may declare the Praises to
Him who called you out of darkness
into His wonderful light."
I Peter 2:9

4. Subject: Re: What is your experience told you?
Wei (xxx@metaxa.wimsey.com)
Mon May 12 11:36:03 1997

Hi Luke,

Thank you for your response. "Well, find a quiet place with book on your hand and enjoy your food." is exactly what I like to do if I don't care to be "left out". I'll try radio as you suggest.

I guess I got uneasy by the suicide and the talking of "strong". It is not shame to be weak especially when one is not weak all the time. I believe everyone here are brave for we choose to challenge ourselves by coming to this country. **I came from another city. There were also male Chinese student suicide.** Vancouver is made more tragic by two at same time. I can't help myself to think "only if they were willing to seek help!" **Why our women are allowed to be weak but not men?** We are all human being. Why not accept that no one is perfect by nature, no one is strong all the time by nature? Why not say "cry out when you feel bad and then you'll feel better." to boys and men same as to girls and women? My parents say this to me all the time and people here understand and encourage me. **It is wonderful to be brave and strong. Yet it is good to accept our weakness and know how to release the tension. Big tree is strong and grass are weak. When storm come, grass are OK while big tree may broken. Personally I like to be grass. They make this world so beautiful.**

I wonder if you know "I Peter 2:9"? I hope your name is from the same book as my name.

Thanks again.

Sincerely,
xxx

"...The lovingkindness, O Lord,
will hold me up.
When my anxious thoughts
multiply within me,
Thy consolations delight
my soul."
Psalm 94:19

5. Subject: Re: Articles: Put your head on my shoulder
Zhao (xxx@chml.ubc.ca)
Thu May 15 13:23:10 1997

On Mon, 13 May 1997, lonely wrote:

> "Put your head on my shoulder..." this is a sentence from an old song.
> In reality, if a girl puts her head on your shoulder, it is so natural and so tender, so lovely, in one word, beautiful. But, suppose, the the man put his head on the girl's shoulder, oh, forget it, disgusting :-)!
> Right?

> From this example, we can see, women enjoy some priviliges which men don't. In actual life, woman can move forward and backward freely. when they move forward, and become successful in work, we call them "iron lady", strong female; when move backward, retread to family unemployed, we say they sacrified their work for the family and for the children.

> But, as for men, there is only one way, that is "move forward", no retread. If you are unsuccessful, and unemployed, can you go back home and "put your head on your wife's shoulder?"

Why not? As long as your wife or your lover love you and would like you to put your head on her shoulder if she can undertake. I think no one can always success in everything. Why not go back to have a rest when you couldnot support youself if you have struggled long time for you and your child(wife).
If your wife still push you hard, I think you should consider again what you should do !
Life and study is tough to everyone. But There are many roads under your feet. The real men should not only go forward bravely, but also turn back have a rest, look for new and suitable way,struggle again. Don'let me feel you live too havey. Giving more positive and active to new coming students--like me.

6. Subject:
lonely (xxx@aicom.com)
Mon May 13 23:08:28 1997

Dear netters,
Sorry for wasting so much of your valuable time. **I guess it is time for me to shut up now. I appreciate the chance you give me to release the pressure build inside me.** Thank you so much. So long.

Lonely.

APPENDIX G

Sample E-Mail Discussions

(Jim, UBC; Helen, Harvard University; and David, University of Illinois at Chicago)

Note: Permission has been obtained from Helen and David. Their e-mail is edited to protect anonymity.

From Jim Hu <jhu@unixg.ubc.ca>
Date: Mon, 20 Apr 1998
To: Helen <xxx@HUGSE1.HARVARD.EDU>
Subject: Re: Jim on Prior et al at TESOL

Helen, I'm glad you put into words here sth I have intuitively felt and have been carrying on - maybe somewhat implicitly - for the last couple of years. I strongly believe in studying the process, the experiences, the struggles, and cultural/social interplays the students went thru rather than analysis of the product alone. I think the process, in my case, thru interviews, can tell a lot more about the students' real difficulties than otherwise.

Jim

Date: Tue, 21 Apr 1998 17:52:58 -0700 (PDT)
From: Jim Hu <jhu@unixg.ubc.ca>
To: Helen <xxx@HUGSE1.HARVARD.EDU>
Cc: David <xxx@uic.edu>

...I talked to some students and faculty. The general answer seems to be that those profs who do not conference with students are too busy to spare the time. Or they consider language problems to be students' responsibility. So in the engineering depts some profs simply don't bother with students language in the course assignments until the diss./thesis draft is handed in. Those publicized docs will bear their names. That's why they care only at that stage, I mean quite a # of them.

Jim

Date: Wed, 22 Apr 1998 18:16:01 -0700 (PDT)
From: Jim Hu <jhu@unixg.ubc.ca>
To: Helen <xxx@HUGSE1.HARVARD.EDU>
Cc: David <xxx@uic.edu>
Subject: Re: value of interaction with students

Hi, David and Helen. Now that you remind me, I think you are perfectly right. From my experience as student and teacher in China, I think the teacher-student relationship is very essential for the motivation of the Chinese students to learn. This ties in with the respect for teacher as authority, as source of knowledge. The respect is not only for the teacher but also for the teacher's knowledge. In other words, if you deviate from the teacher, your creativity may lower your mark.

...

Now back to our previous discussion, the teacher-student relationship is recognized and appreciated by Chinese students but certainly it's not the only reason. I think the conferencing affords an opportunity for face-to-face interactions that mere written feedback lacks. The interactions have a better chance for the teacher to make his/her ideas clear (sometimes thru repetition and alternative explanation) and for the student to grasp the intended ideas.

The two aspects, relationship and interaction, reinforce each other.

Pondering for additional explanations.

Jim

From Helen <xxx@HUGSE1.HARVARD.EDU >
Date: Wed, 22 Apr 1998 11:39:15 -0400 (EDT)
To: David <xxx@uic.edu>
Cc: Jim Hu <jhu@unixg.ubc.ca>
Subject: value of interaction with students

Dear David and Jim,

On Wed, 22 Apr 1998, David wrote:

Helen, I am indeed convinced that students from more collective cultures seem to learn better through personal contact. I have not only read about this--"field dependent" vs "field independent" learning--but have experienced it firsthand, particularly in China. The unsettling possibility (for Western educators like us), which Chinese students have in fact pointed out to me, is that they learn better when the teacher takes a personal interest in them--in other words, favors them over other students. A student's motivation increases in direct proportion to your desire to develop a personal friendship with him/her. This runs against everything we've been taught about professionalism in the teacher-student relationship.

David

Helen responds:

This is fascinating. Helps explain what I've felt for a while--the sense of Asian students sort of coming after me for attention, almost vying to be my favorites, but not quite--becuase of course they're doing it in an Asian way that I don't quite recognize. And which, frankly, sometimes annoys me. But actually your explanation helps me both make sense of their behavior and sort of forgive/tolerate it. And, of course, the next stage, is to be able to talk to them about it and see the cultural differences in our expectations about interactions...

Helen

From Helen <xxx@HUGSE1.HARVARD.EDU>
Date: Wed, 22 Apr 1998 21:30:51 -0400 (EDT)
To: Jim Hu <jhu@unixg.ubc.ca>
Cc: David <xxx@uic.edu>
Subject: Re: value of interaction with students

Thanks for this, Jim and david.

I've been working on my 'findings' chapter and what i seem to be coming to is exactly what you've both just put into words for me. Sure, my folks learn somethign from courses and feedback. But I keep finding that it's all kinds of interaction that really "do the trick" for them--not just conferencing, but being a tutor, and having a teacher ask them about their process, and hashing things out with fellow students...

Still, the biggest one seems to be that key interaction with a teacher. But isn't that true for nearly everyone?

Helen

From Helen <xxx@HUGSE1.HARVARD.EDU>
Date: Sun, 26 Apr 1998 21:28:24 -0400 (EDT)
To: David <xxx@uic.edu>
Cc: Jim Hu <jhu@unixg.ubc.ca>
Subject: student-teacher relationships

Dear Jim and David,

...

Also... and it's only taken me 3 times reading over your message for this bell to actually RING... one of my 6 folks talked over and over during her interviews about the importance of teachers in Taiwan who cared about teaching, as opposed (implicitly, she wouldn't say it out loud) to teachers here. Indeed, this is someone with phenomenal English skills whose primary struggle at Harvard has been to focus her study, find an advisor she felt was understanding, etc., etc. Of COURSE it's about caring!

...

helen

From Helen <xxx@HUGSE1.HARVARD.EDU>
Date: Mon, 27 Apr 1998 11:31:27 -0400 (EDT)
To: Jim Hu <jhu@unixg.ubc.ca>
Cc: David <xxx@uic.edu>
Subject: Re: student-teacher relationships

Dear Jim, and David,

Oh, this keeps getting better..

Thanks for your comments on professionalism. That helps. But this, below, on care, seems to be right on. It just fits so well with what I've seen. I don't know about the suicide. I hardly remember hearing about it. That alone tells us something about Harvard. I'll ask around.

I do think there's a lot to explore here. The ways students expect to have relationships, and faculty simply don't know about it...that creates so much pain. We think it's language difference, but it's relationship difference.

helen

APPENDIX H

A Sample of Writing with Formal Problems

Background

Ritter C. and Dangl J.L (The Plant Cell 8:251-257, 1996) in Feburay, 1996 demonstrated that the interaction of virulence gene *avrRpt2* and the cognate resistance gene ~~-~~RPS2 interferes with the interaction of *avrRpm1*-RPM1 in *arabidopsis*, and *avrRpt2* is functionally epistatic to *avrRpm1* in a manner independent of wild-type RPS2 protein. Therefore, three working models are suggested: (A): the independent interaction of each avr-protein with its cognate R gene product; (B): one avr-protein competes with the other for binding to either the cognate R gene; (C): the direct interference of one avr-protein with the other.

thats ?

were ? what about active voice ?

competing

for what ?

(On this basis)

Question

Is it possible to figure out the real working mechanism by testing the model A, B, and C ?

Answers

(whether?) then

GENERAL APPROACH---Using transient gene expression assay to test if *avrRpm1* or *avrRpt2* protein could induce an HR when expressed inside the plant cells respectively. Then, using yeast two-hybrid system to test whether *avrRpm1* protein directly interact with RPM1 protein, whether *avrRpt2* protein directly interact with RPS2 protein, and whether *avrRpt2* protein directly interact ~~with RPM1~~. Furthermore, ~~to~~ express *avrRpm1* protein, RPM1 protein, *avrRpt2* protein, RPS2 protein, respectively, and ~~to~~ express both *avrRpm1* and RPM1 protein together, and both *avrRpt2* protein and RPS2 ~~protein~~ in yeast cells, respectively. Then perform SDS/PAGE, Western Blot analysis. ~~These~~ methods lead to check the bands showed by Western blotting of anti-*avrRpm1* and anti-RPM1 antibodies, and anti-*avrRpt2* antibodies and anti-RPS2 antibodies.

verb?

we can

we can

I. Testing Model A:

ing

STEP 1. Constructing a plasmid. The *avrRpm1* gene under control of the cauliflower mosaic virus 35S promoter is constructed in pBI121, designated as pBI1. The *avrRpt2* gene under control of the cauliflower mosaic virus 35S promoter is constructed in pBI121, designated as pBI2.

a c

STEP 2. Using gene gun to deliver pBI121, pBI1 and pBI2 to cells of tomato leaves respectively, then Observing the HR. If an HR appeared after introducing pBI1 and pBI2 respectively, and non-HR ~~appeared~~ after introducing pBI121, it means that *avrRpm1*, and *avrRpt2* protein induce a defense response when introduced directly into plant cells expressing the *avrRpm1* and *avrRpt2* genes respectively.

ing

STEP 3. Construction ~~of~~ both *avrRpm1* and RPM1 genes, both *avrRpt2* and RPS genes in the two-hybrid system, respectively. The method is the same as that described (previously) by Tang X et al. Science 274: 2060-2063, 1996. ?

a. Creating chimeric RPM1-Fen constructs by PCR and appropriate restriction enzymes.
b. Chimeric cf9-Fen gene constructs were cloned into pEG202 and introducing into yeast EGY48 containing the *avrRpm1* gene in pJG4.

cloning

then

a + b. a, b, and c

APPENDIX I

A Sample of a Supervisor's Feedback p.1

recently developed a research program which focuses on the fixation chemistry of these systems.

2. Literature Review

have et extremely

the general public high awareness of the need for

Waterborne preservatives ~~are~~ becomi~~ng~~ ~~increasingly~~ popular because of environmental

wood treatments, Such benefit are not

Waterborne preservative

and economical ~~concerns~~ associated with oil borne preservatives, a~~nd they are~~ a major component of the treating industry because of their ease of application, low cost, and the

have ~~[illegible]~~ become

treated wood

pleasant appearance of the wood after treatment (Hulme, 1979). Thes~~e materials~~,

s

preservative

however, require a fixation period after use to ensure that thei~~r~~ components are no longer water soluble and capable of leaching from the treated wood ~~in significant quantities~~.

The wood preservation industry faces a great challenge in bringing new products to the market which satisfy the standards already established by CCA in areas of importance to approval authorities, regulators, treaters and users of treated wood. The four most

Instructor's comment, not // structure

① High

important criteria are: ~~sufficient~~ efficacy against fungi and insects, appropriate to the

② available to be

without

ing

hazard of the end use; ~~the capability of being~~ applied ~~in a way not to~~ caus~~e~~ any detrimental

③

s

of the chemical

effect to the user or to the environment; the requirement for safe handling ~~both~~ at the

of treated wood

④

treatment site and by the end user; and lastly, the need to be cost effective when compared

(Hulme, 1979)

with alternative materials such as plastic or concrete. One group of preservatives that

the

ive is the

shows promise in meeting many of the requirements of modern wood preservati~~on~~ ~~is the~~

copper

ammoniacal/amine systems.

2.1 Historical development of ammoniacal and amine copper preservatives

Ammoniacal copper wood preservatives have been known since the beginning of the century. One of the first to be introduced was Aczol in 1907, an ammoniacal solution of lignin adsorption than ~~in the case of~~ cellulose. ~~Their results~~ These observations suggested that cation exchange with carboxyl and phenolic hydroxyl groups may be the dominant mechanism for DDAC adsorption onto lignin, and demonstrated that the affinity of (m) ? unamended quaternary ammonium compounds towards individual wood components follows the order of lignin > hemicellulose > ~~and~~ cellulose. ~~Andress~~ Doyle (1995) ~~found the~~ confirmed while lignin and wood adsorbed relatively large quantities of DDAC, ~~and cellulose~~ DDAC adsorption on cellulose was very limited. The adsorption by ion exchange that occurred in wood and lignin account for 13% ~~to~~ and 26% of DDAC adsorbed, respectively. The other 74% to 87% of the DDAC was adsorbed by a combination of ion pairing, dispersion forces and hydropholic interaction. ~~These observations were consistent with the finding by Jin and Preston (1991).~~

~~The bonding sites for copper in wood from~~ a ~~Ammoniacal/amine based systems, has been a topic of investigation for a long time.~~ Current research has focused on ~~Both~~ phenolic and carboxylic functional groups ~~have been discussed~~ as potential bonding sites for copper. ~~The most~~ Recent research (Thomason and Pasek, 1997) has reported that selective adsorption to southern pine sawdust of copper and boron from amine ~~based~~ copper preservative solution is achieved via two distinct and separate pathways. Adsorbed copper determined in this way was shown to react exclusively with the carboxylic groups found in hemicellulose constituents. Contrastingly, boron was found not to react with the carboxylic groups, but rather with ~~some other~~ another wood component, (presumed to be ~~presumably~~ lignin) by the formation of borate esters. The mechanism for selective copper adsorption proposed ~~in this paper~~ by Thomason and Pace ~~is~~ contradict~~ory~~s ~~to conclusions made~~ the general reactivity shown between lignin and copper found by other researchers and proposed ? by Pizzi (1982) and Xie (1995). ~~who proposed a copper:lignin complex. Their results were based on model lignin compounds.~~ It is important to note that ~~It is suggested that the~~ reactions of copper preservatives in the heterogeneous structure of

The authors considered that the difference between the copper retention measured in treated sawdust and that calculated on the basis of solution absorbed, was due to the absorbed copper.

APPENDIX J

A Sample of a Supervisor's Feedback

III. Materials and Methods

1. Materials

of indentical size size (–W.

them

Four ~~identical~~ reactors are used, two of which are used for suspended growth and the other two are for immobilized growth. The mixed culture activated sludge is obtained from the pilot-scale municiple waste water treatment plant, ~~in~~ at the South Campus of UBC. Brewery waste water is collected from Molson Brewery, Vancouver, B.C. (Spell out)

V

2. Methods

the plant

1) Sequencing batch reactor set-up

The working volume of the reactors is 10-12 L. Two peristaltic pumps are used to pump the influent into the reactors and pump the effluent out. Oxygen supply is provided by aquarium aerators. The time control of SBR and monitoring of pH and Dissolved Oxygen concentration in the reactors are performed by Labtech. Control software. The same amount of mixed culture activated sludge are seeded into four reactors.

a Figure is required ?

2) Sampling

After microbial build-up in reactors (after a period of acclimatization)

Samples are taken from the Influent and the Effluent of each run. Identical analyses will be done on both the influent and the effluent samples. The BOD5, COD, total suspended solids, suspended solids, volatile solids, suspended volatile solids are determined according to the Standard Mehtods (A.P.H.A. 1985 ~~1~~). ~~And~~ Dissolved Oxygen concentration (DO) and pH in the reactors are continuously monitored. Ammonia-N, nitrate-N, orthol-P and total Kjeldahl nitrogen(TKN) are analyzed periodically using a Technicon Auto AnalyzerII (Schumann et al., 1983).

To study the relationship of microbial population and suspended and immobilized growth, ~~we are going to observe~~ the morpological change of the microbial population under microscope will be observed.

3) Experimental Design:

characteristics (settlability)

In the preliminary ~~pre~~-experiments, it was ~~we~~ found ~~out~~ that these aerobic sequencing batch reactors ~~system~~ may be limited by factors such as the rate of ~~adequate~~ oxygen transfer, the settling of the biomass, the process stability under different loading, as well as the fluctuation of pH in the waste water. ~~We are going to design~~ Factorial experinments will be carried out to effectivelly investigate the influence of pH , HRT ,and Loading rate on the efficiency of treatment, as well as to compare the suspended growth reactor and immobilized growth reactor.

IV. Further consideration:

By running factorial experiments , attempts will be made ~~we may be able~~ to find the optimal operating conditions for these set of reactors. ~~We~~ will be considered using dissolved oxygen concentration in the reactor to create a realtime control, since the dissolved oxygen concentration changes in the reactor will indicate the microbial activity as well as the nutrients condition within the reactor.

VI) References

full form preferred

1. Choate, W. T. et al., 1983, " Membrane-enhanced anaerobic digesters ", Proc. 37th Industrial Waste Conference, Purdue University, Indiana, USA, pp. 661-666.

2. Christensen, M. H. et al., 1977, " Combined Sludge Denitrification of Sewage Utilization Internal Carbon Sources ", Prog. Wat. Technol., 8, 589-997.

3. Cronin, C., 1996, "Anaerobic treatment of brewery wastewater using a UASB reactor seeded with activated sludge", Master thesis ~~Thesis~~, the University of British Columbia.

4. Dague, R. R. et al., 1966, " Anaerobic activated sludge ", J. Water Pollution Control Federation, 38(2),

5. Dague, R. R., 1992, " Initial studies on the anaerobic sequencing batch reactor ", Wat. Sci Tech., 26(9-11), pp. 2429-2432.

full form?

APPENDIX K

A Sample of Writing with Supposed Copying

3.1 Experiment Design

Ten structural criteria are investigated. As they apply to programs whose control and data flow graphs remain tractable, their main application field is unit testing. For each criterion, they consider two types of test input generation: deterministic and statistical. In structural deterministic testing, inputs are predetermined by a selective choice according to the given criteria. In random structural testing, inputs are randomly selected according to a defined probability on the input domain, and both the distribution and the number of input data are determined according to the given criteria. In practice, people making use of random patterns often draw test inputs from a uniform distribution on the valid input domain. This generation method, called uniform statistical testing, has led some authors to deny the adequacy of randomly selected test sets. They also make an experiment with it in order to examine its limits in relation to structural statistical testing.

Project

APPENDIX L

A Sample of Writing through Perceived "Brick-Collecting"

A study showed that growth of S. aureus was inhibited by EDTA and its K or Na salts, but not by Fe or Ca salts. Addition of Fe, Zn and ~~Ca to media~~ reversed the inhibitory action, whereas ~~Mg~~ was far less effective (Kraniak and Shelef, 1988). The survival rate of S. typhimurium could be decreased from 1 to 5 logs by the treatment of EDTA and lyophilization ~~(Kabara, 1991)~~. The effects of combinations of nitrite, isoascorbate and EDTA have been studied on C. botulinum in canned meat. It showed that the presence of EDTA was necessary to delay the outgrowth of spores, since the control without EDTA showed no inhibition. EDTA may remove iron which is sufficiently high in cured meat to nullify the usual effects of nitrite and isoascorbate (Kabara, 1991).

A recent study showed that EDTA can make Gram-negative species susceptible to the action of nisin. Nisin in combination with disodium EDTA could decreases Salmonella species and E. coli O157:H7 significantly at 37°C. Treatment with Na2EDTA or nisin alone produced no significant inhibition of the Salmonella and E. coli O157:H7. The most likely mechanism is a disruption of the Gram-negative outer membrane by EDTA chelation of membrane-stabilizing magnesium ions, thus exposing the cell to the action of nisin (Stevens et al. 1991).

indicates (?)

Unclear!!

very sketchy

??

e.g.

of bricks collecting

place ref. at the beginning.

APPENDIX M

A Sample of Writing with Problems Presumably through Translation

There is general agreement that diversity at all levels of biotic organization is necessary for functional purposes and evolution. Biotic system require variation to respond to changes, and genetic variance is a key parameter that determines the rate of evolutionary respond to selection forces. There is no evolution~~ary~~ without genetic variance, and future survival may depend on variants that may not now exist. We therefore assume that even if no fixed state can serve as a goal, ~~that~~ there is common agreement on the necessity to conserve variations. ~~In such an objective,~~ for most species, this objective implies managing only to maintain or maximize evolutionary potential.

APPENDIX N

A Sample of Writing with Linguistic, Rhetorical, and/or Cognitive Problems

Illustration 1
So far, the only study on fractal dimension directly applied to wood exists (Brown, Smith 1994) [The names of the two quoted authors have been changed to preserve anonymity].
(Excerpt from Ting)

Illustration 2
I. Introduction:

Since the invention of computer, it has increasingly become pervasive in our society and constituted an essential part of our civilization. On one hand, the hardware developed with a dramatic speed and incessantly upgraded with acceleration, on the other hand, the software remains in large scale manual. Also, while the reliability of hardware in nowadays is quite high, the correct behaviour of software is to at least some extent without guarantee. There are several reasons for this phenomenon: [1]

Programs are hard enough to write even without having to also write program checkers for them;

2. It's difficult to develop program checker and there is no clear notion what constitute a good checker.

In an effort to improve this situation, the strict engineering discipline should be applied to the development of software systems (programs). Nowadays, many research works have been done with respect to software & system testing.

Basically, the fundamental of software testing is to develop a mechanism that will determine whether or not the results of a test execution are correct with respect to specifications. In practice it is often done by comparing the actual output, no matter obtained automatically or manually, to some pre-calculated and assumed correct output. The problem is, in many cases it is very time consuming, tedious and error prone to get such expected output. However, once if the program has been formally specified (documented), then it is possible to develop a testing method based on such formal specifications, i.e. using the specification to directly determine whether or not a software system has been successfully developed.

Motivated by the above reason, how to constitute formal program specification and achieve software testing based on it become an important branch among software system testing.
(Excerpt from Ping)

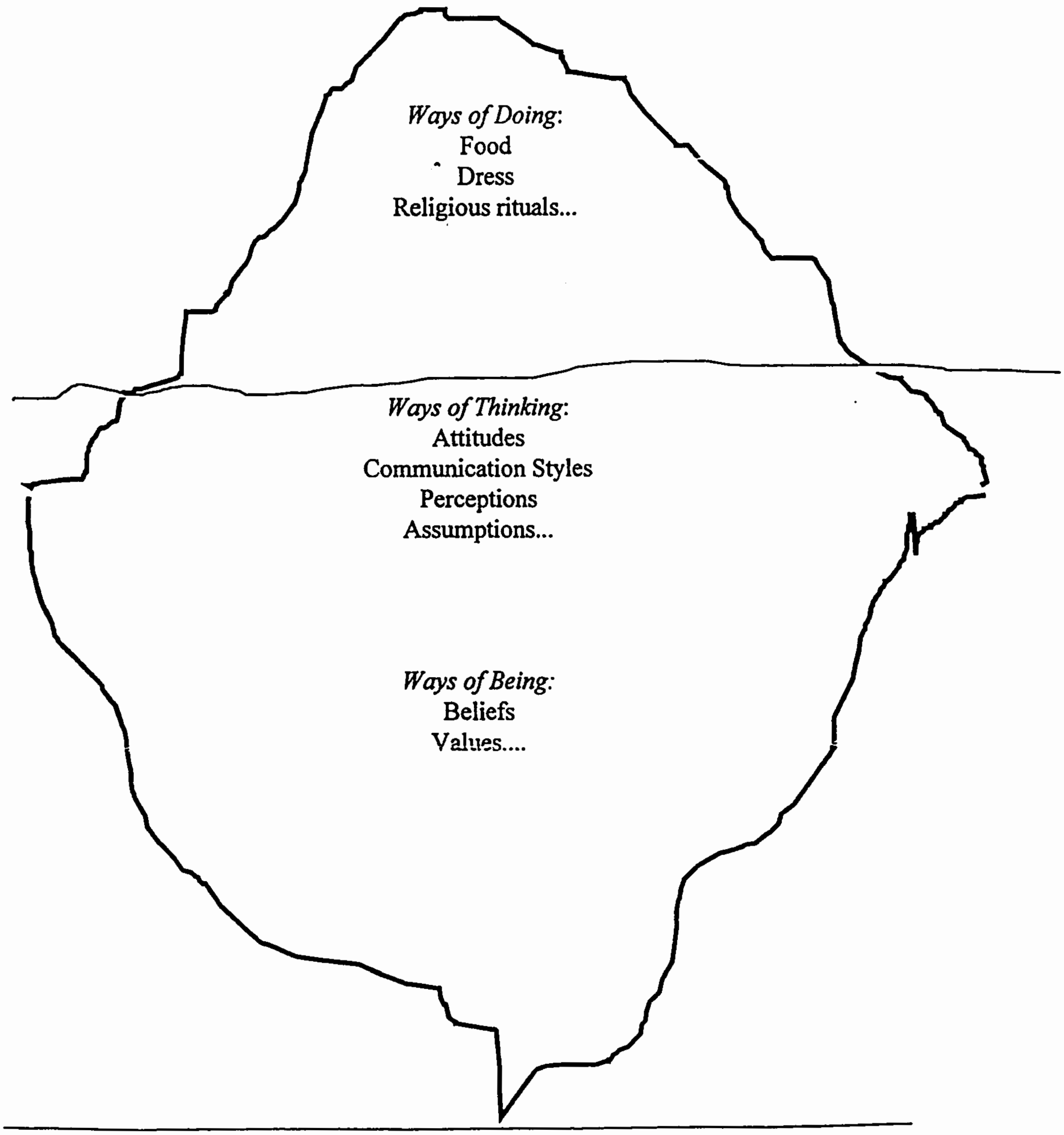
Illustration 3
VIII. Conclusion

In this project, the main procedure of two dimensional SAR radar signal compression procedure are illustrated, including signal generator, range compression, azimuth FFT, range cell migration correction (RCMC), azimuth compression. Finally real time requirements are given. Many signal processing technique are employed, such as fast convolution, match filter and so on. A compressed pulse is got, the compressed pulse is as good using frequency domain RCMC interpolator as using time domain RCMC interpolator, this is because the azimuth compression is very sensitive to the mismatch of parameters.
(Excerpt from Qing)

APPENDIX O

The Iceberg View of Culture

Culture has often been described as an iceberg. At the "tip of the iceberg" are the visual manifestations of culture. Under the surface in the main body of the iceberg are the underlying, ingrained patterns of thought, learning and ways of being of cultures. These are most often the areas that cause cultural bumps when communicating across cultures.


Ways of Doing:
Food
Dress
Religious rituals...
Ways of Thinking:
Attitudes
Communication Styles
Perceptions
Assumptions...
Ways of Being:
Beliefs
Values....

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APPENDIX P

Are UBC's ESL facilities capable of supporting the university's international aspirations?

Research-Based Comments on the UBC Vision Green Paper: The ESL Factor

(Published in *The Graduate*, Sept./98)

Jim Hu

I am a PhD candidate in Curriculum and Instruction with a concentration on Teaching English as a Second Language in the Faculty of Education. My dissertation research, guided by Drs. Carl Leggo and Bonny Norton of the Department of Language Education, explores the experiences and perceptions of Chinese graduate students of sciences and engineering in academic writing at UBC. Before I decided on my topic, I conducted an informal survey of the English as a second language (ESL) support facilities for graduate students. The programs I inquired about were such as offered by the English Language Institute (ELI), the Writing Centre, Continuing Studies, International House, AMS, and English Department. I visited their web sites, read their program brochures, the UBC Calendar and Registration Guide, and talked to some administrative staff. I found ESL support for graduate students in these programs was either very minimal or nonexistent. While English was offered in a few ESL courses, usually for a fee, almost none of them were meant to meet the academic needs of ESL graduate students (Note: The Writing Centre started to offer a 16-hour writing course for graduate students soon after this article was published). The only two programs, funded by the Teaching and Learning Enhancement Fund, which ESL graduates can attend are (1) Spoken English Tutorials offered by Language Education and UBC Lib and (2) ITA Program sponsored by Intercultural Training and Resource Center. Both these programs focus on oral communication to the exclusion of writing. To conclude, the ESL support for graduate students at UBC is very minimal, especially in terms of academic writing.

As part of my dissertation research, I have conducted multiple in-depth interviews with 14 Chinese graduate students of sciences and engineering regarding their academic writing experiences and challenges and a one-time interview with seven faculty members. Preliminary findings reveal: 1. All the student participants experienced difficulty of various degrees in both written and oral English, especially in the initial stages of their studies at UBC. 2. The language difficulties affected the students' course work and research. 3. The faculty generally did not know of any formal language course for ESL graduate students offered on campus and those concerned about the time spent revising ESL students' drafts longed for formal ESL courses to relieve them of the burden to help ESL students with their writing.

Based on my research and that of others in my field, I would like to make the following comments: The draft Vision places internationalization as one of its major principles and international students and scholars as one of the corresponding strategies. However, one critical component is missing, namely, communication. It appears to me that Vision might have assumed that everybody (to be) connected with UBC speaks and writes English and that communication is not a problem. The reality is often a big NO once we start to talk about/with people in or from other countries. However, no mention is made in the Green Paper of ESL support services for international students, visiting scholars, or international contacts. I believe unless the issue of English language support is adequately addressed (I think it is high time to get started), our efforts for internationalization will be greatly compromised. On the other hand, I cannot overemphasize that smooth language communications will facilitate and enhance internationalization.

While other initiatives may need to be introduced, I present a recommendation offered by some of my faculty participants that credit ESL courses be offered to graduate students. These courses, lasting one term but offered all year round, may include ESL Academic Writing for Sciences and Engineering Graduates, ESL Academic Writing for Humanities and Social Sciences Graduates, and ESL Oral Communications. Similar courses should be offered to ESL undergraduates (English 100 level courses and other English courses for native English speaking students do not directly address the special needs of ESL students). If the courses are not awarded credits, they may not be taken seriously. To accommodate the offering and administration of these courses and support services, I would like to suggest for the Vision a restructuring and redefining of the current ESL support facilities, and the creation of an academic development center for ESL students. I see this new function as fundamental to UBC's boosting the quality of its research as well as enhancing the marketability of its growing number of ESL students, not to mention its contribution to the focus on internationalization. Many universities in the U.S. have set excellent examples in ESL support. I think it is time for UBC to catch up if it is serious about its aspirations.