CHPATER ONE

INTRODUCTION

In the early 1960s, the invention of computers has shaped language learning and teaching. Language teachers have employed a variety of CALL programs in classrooms to foster second language learning. For instance, teachers may use hypermedia technology to facilitate learners' vocabulary learning (Liu, 1994) or electronic dictionaries to enhance learners' reading and writing (Hulstijn, 2000). As the technology advances, more interactive features are incorporated into the uses of CALL (Liu, Moore, Graham, & Lee, 2003). With the advent of Internet, learners are provided with ample access to authentic interactions with other learners all over the world via local or worldwide computer networks. The use of networked computers to facilitate human communication is commonly known as computer-mediated communication (CMC).

With the increasing popularity of CMC, some studies have attempted to examine a variety of issues between CMC and face-to-face class discussion. These issues include students' online interaction (Beauvois, 1998), language production (Kern, 1995), participation equality (Warschauer, 1996), oral proficiency (Payne & Whitney, 2002), and thinking ability (Warschauer, 1996). As suggested in previous studies, one notable issue of CMC mode is its potential to enhance thinking ability (Warschauer, 1996). This claim has inspired some researchers to investigate the potentials of CMC for teaching critical thinking skills (e.g., Bloch's, 2004; Garrison, Anderson, & Archer, 2000; McAlister, Ravenscroft, & Scanlon, 2004). According to Diane (1997), critical thinking refers to "the use of those cognitive skills or strategies that increase the probability of a desirable outcome" (p. 4).

In the L1 context, the use of asynchronous CMC for facilitating critical thinking

in distant education was widely investigated (Garrison, Anderson, & Archer, 2000; Garrison, Anderson, & Archer, 2001; Kanuka & Garrison, 2004). These studies argued that text-based communication such as computer conferencing provided time for recall and reflection, and thus had considerable potential in fostering rigorous critical thinking. In analyzing the online transcripts, Garrison, Anderson, and Archer (2000) proposed "cognitive presence" to assess critical discourse in a text-based educational environment. Based on Kanuka and Garrison (2004), cognitive presence is a manifestation of practical inquiry, which is defined as the extent to which learners were able to construct and confirm meaning through collaborative discourse in a critical community of inquiry (p.3). Cognitive presence represents a cyclical concept of critical thinking: producing a triggering event, exploring relevant information, integrating ideas, and resolving problems (Garrison, Anderson, & Archer, 2001). They further developed a model of practical inquiry that comprised the four phases of cognitive presence (triggering event, exploration, integration, and resolution) in a critical community of inquiry. Even if the model has been proposed as a tool to assess critical thinking in an educational computer conference, few studies have applied the model to examine students' critical thinking in a L2 context.

In addition to the studies examining the ways of assessing critical thinking in the L1 context, other studies have tried to investigate critical thinking in the L2 context. One crucial issue revealed from the studies of critical thinking in the L2 context is to investigate critical thinking in different types of online discussion—online debate (McAlister, Ravenscroft, & Scanlon, 2004) and online free discussion (Bloch, 2004). McAlister, Ravenscroft, and Scanlon (2004) observed the development of L2 learners' critical discourse in online debating sessions. It was found that during online debating sessions, the students checked their understanding of the issues by challenging others' perspectives and defending their own positions. In addition, they constructed

knowledge about issues and developed alternative views through online collaborative reasoning. As a conclusion, L2 learners' thinking skills may be promoted in online debating sessions via synchronous CMC.

While McAlister et al.'s study investigated critical thinking in online debating sessions, Bloch's (2004) study examined critical thinking in online free discussion. Bloch argued that in online free discussion, Chinese writers were able to freely express their arguments and viewpoints. In addition, he found that the text-based communication helped the Chinese writers develop a collective interpretation of an issue and take action for the issue and the problem being raised. These identified rhetoric features offered a unique insight into the nature of critical thinking that Chinese writers exhibited in online free discussion.

These studies have provided positive results concerning enhancement of critical thinking in online debate and online free discussion. However, the extent of how EFL students perform critical thinking in two types of online discussion formats—debate and free discussion—has not been explored. Additionally, little research attempts to examine if EFL students' interaction patterns may vary in different types of online discussion.

Given the unresolved issues like the adoption of the practical inquiry model in assessing critical thinking in a L2 context, and the comparison of critical thinking as well as interaction patterns in different types of online discussion, the present study attempts to assess EFL undergraduate students' critical thinking by means of four-phase cognitive presence, and compare their interaction patterns in two types of online discussion — free discussion and debate. Additionally, the relationship between interaction patterns and cognitive presence in two types of online discussion will be examined. Three research questions were addressed.

1. What differences of interaction patterns can be found in EFL college students'

online discourse through two types of online discussion — free discussion and debate?

2. Do EFL college students perform different phases of cognitive presence in online discourse through two types of online discussion— free discussion and debate?
3. Are EFL college students' interaction patterns related to their cognitive presence in online discussions?

To examine interaction patterns and cognitive presence in online discussions, the study was conducted in an elective English writing course where thirty EFL college students were required to participate in online discussion via a web-based classroom management system. Data were collected from a background questionnaire and the students' online postings which were analyzed based on: 1) Henri's (1991) model of interactive behavior and communicogram drawings to determine the interaction patterns, and 2) Garrison et al.'s (2001) practical inquiry model to determine the phases of cognitive presence exhibited in each type of discussion. Additionally, the relationship between interaction patterns and cognitive presence was examined. In the following chapter, a review of the related literature is presented.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, a brief overview of CALL was first presented. Next, the nature of CMC and CMC-based studies in L2 Education were discussed. Finally, studies of critical thinking in L2 education were briefly examined.

CALL Overview

In the early 1960s, the invention of computers has shaped language learning and teaching. Language teachers have employed a variety of CALL programs in classrooms to foster second language learning.

In the earliest CALL programs, the majority of these technological innovations were non-interactive uses, mostly appearing in the form of monotonous drills and practices. These drill programs tended to emphasize on the accuracy of linguistic forms and achieved products, rather than the cognitive or social processes. As the technology advanced, more sophisticated programs came of age, contributing to the emergence of the next stage of CALL. At the second stage, the pedagogical emphasis shifted from repeated drills of accurate linguistic forms to learning system of mental construction. Therefore, more learner-oriented programs have been developed to help learners construct new knowledge in the process of developing understandings in a simulated environment. In recent years, with prevalence of computer technology in both schools and households, we have seen more interactive features being incorporated into CALL programs, providing learners with ample access to authentic contexts and social interactions with other people. This paradigm of CALL enables learners to interact with others via computers for meaningful interaction in more authentic communities.

From the shifts of computer use, Kern & Warschauer (2000) discussed the role of technology in pedagogical frameworks. They claimed that "shifts in perspectives on language learning and teaching have paralleled developments in technology from the mainframe to the personal to the networked computer" (p.7). The theoretical perspectives on language learning and teaching have been shifted from structural, cognitive to sociocognitive approaches. In line with the shifting views of learning, the role of technology has changed from structural, cognitive to sociocognitive frameworks on account of technology development. The corresponding shifts between the language theoretical development and paradigm shifts of CALL are outlined in Table 2.1.

Table 2.1

Corresponding Shifts Between the Language Theoretical Development and CALL Paradigm (Kern & Warschauer, 2000)

Paradigms	Language Theoretical Development	CALL
Structural Approaches	Emphasize on structure and achieved linguistic product rather than cognitive or social processes	Provide immediate feedback and repeated drills
Cognitive Approaches	Shift its emphasis from habit formation of accurate linguistic forms to learning system of mental construction	Provide opportunities for problem solving and hypothesis testing
Sociocognitive Approaches	Aim at exposing students to authentic contexts and social interactions	Enable learners to interact with others via computers for meaningful interaction in authentic communities

Given the shifts of CALL paradigms, it is important to explore the potentials of CALL in second language learning. The implementation of computer uses in second

language classrooms has become widespread in education. As the technology advances, more interactive features are incorporated into the uses of CALL (Liu, Moore, Graham, & Lee, 2003). With the advent of Internet, learners are provided with ample access to authentic interactions with other learners all over the world via local or worldwide computer networks. The use of networked computers to facilitate human communication is commonly known as computer-mediated communication (CMC). In the next section, the definition of CMC and unique features of CMC from other computer applications are provided.

Nature of CMC

According to Herring (1996), CMC refers to "communication that takes place between human beings via instrumentality of computers" (p.1). With the rapid development of Internet, CMC has become a worldwide communication medium among language users. The phenomenon of CMC has intrigued TESOL educators and researchers to understand its distinctive characteristics in CMC-based speech communities. In CMC environments, language users exhibit different forms of turn-taking and discourse threads that are crucially different from face-to-face communication as well as other medium of communication. For instance, discussion boards allow language learners more time to post prepared responses, whereas face-to-face conversation entails immediate responses. TESOL educators and researchers have begun to understand the distinctive nature of CMC from two aspects: linguistic features of CMC (Collot & Belmore, 1996; Yates, 1996; Davis & Thiede, 2000; Sotillo 2000) and interactional features of CMC (Werry, 1996; Darhower, 2002).

Linguistic Features of CMC

The electronic language involved in CMC has been regarded as a new variety of language, which exhibits distinctive linguistic features. In order to investigate how electronic language differed from other varieties of English, Collot & Belmore (1996) conducted an empirical study by comparing two corpora: a privately collected corpus of Electronic Language and the Survey of English Usage corpus. Based upon Biber's multidimensional-multi-feature model (1985), these researchers described the unique linguistic features of BBS language. They found that BBS language exhibited: 1) more information of spontaneous genres, 2) more non-narrative features, 3) higher frequency of overt expression of persuasion, 4) greater informational elaboration, 5) frequent conjuncts and adverbial subordinators, and 6) more time and place adverbials for the explicit identification of referents. To draw a conclusion, some features of electronic language were similar to written genres, while others were more associated with spoken genres.

Similar to the aforementioned study which used large data sets, Yates (1996) compared the differences among spoken, written and CMC discourse by large corpora. The CMC corpus was collected from 218 messages in the CoSy system, compared with written texts from Lancaster-Oslo/Bergen corpus and spoken texts from London-Lund corpus. This researcher analyzed the data by Hallidayan model of language use (1978), with particular attention on textual, interpersonal, and ideational features. The results indicated that CMC was akin to written discourse in the textual aspect, but greatly different from spoken and written discourse in the aspects of pronoun and modal auxiliary use. Based upon the findings, he concluded that CMC combined both features of spoken and written discourse. This conclusion coincided with the findings of Collot & Belmore (1996).

From a sociolinguistic perspective, Davis & Thiede (2000) examined the

discourse features of EFL learners in the forum of electronic postings, with a focus on style shifting and accommodation. In this study, three Chinese and Japanese graduate students participated in the asynchronous conferences with thirty-one graduate and advanced undergraduate students from the University of North Carolina-Charlotte. From the L2 learners' reflections, it was found that they became aware of discourse conventions while interacting with L1 writers in the asynchronous exchanges. Being engaged in an L1 context, they emulated L1 writers' organization, changed their style to the perception of status, and accommodated to the American use of compliments in the asynchronous conferences.

Sotillo (2000) further investigated the differences of discourse functions and syntactic complexity in synchronous mode and asynchronous mode of CMC discussions. Twenty-five students from two advanced ESL writing courses participated in two types of computer-mediated learning tasks: one was synchronous (online discussion by using Internet Relay Chat), and the other was asynchronous (threaded postings by analyzing assigned readings). Data was collected from 90 minutes of synchronous discussions at different time intervals and 105 postings to the discussion forum. By applying T-unit analyses, the researcher showed that types of discourse functions in synchronous discussions were closer to those in face-to-face conversations, whereas more syntactically complex language was found in asynchronous discussions.

Interactional Features of CMC

In addition to the linguistic features, the interactional features constitute a second crucial aspect of CMC nature. Increasingly, CMC tools such as MSN and SKYPE are becoming popular among young users. However, without nonverbal cues (gestures and facial expressions), Internet users inevitably need to employ different ways to

interact with others. This phenomenon has intrigued many researchers to investigate possible forms of interaction resulted from this unique medium of communication.

Werry (1996) examined the characteristics of interactional written discourse produced on Internet Relay Chat (IRC). The extracts used for this study were collected from two-minute sessions: one was English-speaking channel, and the other was French-speaking channel. Based upon the extracts, the interactional properties of IRC were described in terms of addressivity, abbreviation, prosody, and actions. In order to avoid ambiguity, online speakers intended to indicate the addressee by putting the person's name at the start of an utterance, which was characterized as addressivity of IRC discourse. In addition to addressivity, online speakers tended to use short length and various forms of abbreviation to sustain the rapid flow of conversation. By prosody, Werry referred to orthographic strategies such as capitalization and punctuation employed by online users to compensate for the lack of paralinguistic cues. The final property of IRC was actions, indicating that online speakers employed words and visual images to symbolize gestural qualities of face-to-face communication. This research clearly demonstrated that synchronous interaction was shaped in the way that simulated face-to-face spoken language.

Chat rooms, emerged as one of the most popular forms of CMC among young users, are interesting environments in which L2 interaction can be investigated. From a sociocultural perspective, Darhower (2002) explored the interactional features of synchronous CMC by analyzing the discourse in chat room communication. The participants were 33 English learners in two intact intermediate Spanish classes that employed an integrated-skills approach. After selecting pseudonyms, the learners were divided into four groups engaging in chat room discussions through the *WebCT* program. To understand the nature of chat room communication, the researcher analyzed 300 pages of transcripts by the research approach of discourse analysis.

Based upon the Vygotskian theoretical framework, the interactional features that emerged from the data were described as intersubjectivity, off-task discussion, social cohesiveness, exploration of identities and role plays, and the use of L1. Intersubjectivity and the use of L1 might be the most unique features found in this study. In the Vygotskian view of cognitive development, collaborative discourse entailed shared background knowledge among learners, which referred to intersubjectivity. As this concept related to the data, the establishment of intersubjective communication was particularly challenging in the chatting environment without nonverbal cues and systematic turn-taking rules. The other noticeable characteristic was the use of L1, by which the English learners were able to maintain conversation in Spanish throughout the nine chat sessions when they met difficulties in expressing the meanings of Spanish lexical items.

Studies of CMC in L2 Education

Previous studies have shed light on the nature of CMC by examining its linguistic features as well as interactional features, and now the researcher examines the studies of incorporating CMC in L2 education. CMC has several applications in language-learning environments: CMC has been used for enhancing cultural awareness (Gray & Stockwell, 1998; Itakura, 2004; Zeiss & Isabelli-Gracia, 2005), for fostering language skills (Abrams, 2003; Cummings, 2004; Payne & Whitney, 2002; Yang, 2006), and for promoting collaborative language learning (Paramskas, 1995; Warschauer, 1997; McAlister, Ravenscroft, & Scanlon, 2004). With the increasing popularity of CMC, some studies have attempted to examine a variety of issues between CMC and face-to-face class discussion (Kern, 1995; Warschauer, 1996; Beauvois, 1998; Payne & Whitney, 2002).

CMC for Enhancing Cultural Awareness

It is widely recognized that learners should be provided with opportunities to interact with target language speakers and the target culture. As suggested by Itakura (2004), understanding cultural practices and meanings plays a crucial part in foreign language learning. Various studies have reported positive effects of asynchronous CMC exchanges on the enhancement of cultural awareness.

Gray & Stockwell (1998) conducted a small-scale pilot study to examine the effect of CMC on intercultural awareness by engaging students in e-mail correspondence within a time span of five weeks. Eighteen Australian undergraduate students were assigned to nineteen undergraduate students in Japan, exclusively using Japanese as the language of communication. In addition to the e-mail exchanges, all the participants were required to complete a retrospective questionnaire. According to the responses in the questionnaire, Australian learners of Japanese found that they developed a better understanding of Japanese culture. Furthermore, they acquired more lexical items, idiomatic expressions, and Japanese orthography while being engaged in authentic language interactions with Japanese speakers. However, from a perspective of language learning, the benefits seem to be one-way since Japanese learners were not provided with opportunities to use English alternatively.

In order to explore the formation of cultural stereotypes, Itakura (2004) conducted a collaborative intercultural e-mail project between Hong Kong learners of Japanese and native Japanese speakers. Thirty Hong Kong undergraduate students and four Japanese students participated in the project, exchanging attitudes toward life such as love and marriage. Additionally, they administered a questionnaire to investigate the cultural differences and similarities between Japan and Hong Kong. At the end of the project, all the participants wrote a project report in Japanese on a basis of their responses to the questionnaire. Analysis of data was thus based upon e-mail

exchanges, four project reports, and interviews. These data revealed that Hong Kong students' stereotypical assumptions about Japanese culture were validated and modified through e-mail interactions. As a result, they developed more diversified views of Japanese culture.

Borrowing similar procedures frequently used to provide authentic language experiences, Zeiss & Isabelli-Gracia (2005) addressed the effects of CMC on enhancing cultural awareness by asynchronous exchanges. An experimental group of twenty-three American students received extra CMC exchanges with Mexican students, whereas a control group of thirty-eight American students were engaged in class discussions only. Data were collected from a questionnaire, administered in the form of a Lickert-scale. The responses on the questionnaire were subsequently analyzed by a chi-square test to confirm the significance of the greater tendency on increased cultural awareness as well as enhanced motivation to study abroad in the experimental group. This study demonstrated that students were better informed about the target culture by engagement in intercultural activities through the convenient medium of CMC. Another important finding of this research was that, unlike the previous two studies, it indicated the degree to which learners' cultural awareness was enhanced with statistical evidence.

CMC for Fostering Language Skills

One pedagogical application of CMC was to augment foreign language skills such as writing and speaking. In a variety of studies, the relationship between second language oral proficiency development and synchronous CMC has been examined. In an attempt to explore the role of synchronous CMC on enhancing language proficiency, Chun (1994) undertook a longitudinal study of first-year German students over two semesters. All the students participated in topic discussions by means of

computers, and data were thus collected from five computer networking sessions during the first semester and nine sessions during the second semester. Based upon the transcripts, the quality and quantity of the written discourse were analyzed. The results showed that the use of synchronous CMC provided foreign language learners with opportunities to generate different types of discourse as well as interactional speech acts. She further suggested that this type of written discourse strongly resembled spoken conversation, and thus it might be gradually transferred to spoken competence.

Similar to Chun's research, Payne & Whitney's (2002) investigated the relative impact of synchronous CMC on learner oral proficiency. The specific intent of this study was to relate L2 oral proficiency with the cognitive construct of working memory proposed by Levelt's (1989). The study employed a quasi-experimental design with two experimental groups receiving extra online periods and two control groups receiving the face-to-face instruction. To measure verbal working memory, a nonword repetition task and a reading span test were administered to the participants. The scores of four groups on the tasks were then compared by ANOVA to examine if there was significant difference in oral proficiency development among four groups. The results gave a preliminary indication that participants spending a half of time in synchronous discussions were advantaged in their oral skills over those receiving face-to-face instructions only. It was thus implied that a direct transfer from writing to speaking occurred through the medium of synchronous CMC.

Concurring with the findings of Payne & Whitney's quasi-experimental study, Abrams (2003) discovered the transferability of CMC to oral skills. In a German course, ninety-six intermediate American students were divided into one control group (no CMC) and two experimental groups—Group A with extra synchronous CMC and group B with extra asynchronous CMC. For analyzing the effects of

synchronous and asynchronous CMC on oral production, learners' pretest and posttest scores of oral output were calculated for the number of words, the lexical density, and the syntactic complexity. As the results revealed, participants in the synchronous mode outperformed those in the asynchronous mode and in the face-to-face mode with regard to quantity of speech. With regard to the lexical density and the syntactic complexity, no significant difference was found.

Aside from these studies exploring the potentials of CMC for enhancing language-learning students' oral skills in L2 context, Yang (2006) examined the effects of synchronous CMC on Taiwanese learners' English oral proficiency. With a quasi-experimental design, fifty-nine college students were divided into a comparison group with unstructured synchronous CMC sessions and an experimental group with structured synchronous CMC sessions for English chatting. After sixteen-week instruction, the scores of both groups' oral performance were compared by ANOVA. She found no significant differences between the two groups in the mean scores of pretest and posttest for oral output. It indicated that structured synchronous CMC did not seem to enhance students' English oral proficiency.

The aforementioned studies focus on the potentials of CMC for fostering oral performance, while the study conducted by Cummings (2004) attempted to investigate the effect of CMC on the enhancement of student composition skills. As an instructor for EFL writing classes in Japan, the researcher established an asynchronous Internet classroom to reduce learning anxiety and to improve the quality and quantity of student writing. As a course requirement, the Japanese students responded to the assigned readings in the CMC classroom. After fourteen-week observation, the researcher found that they changed their perceptions of English writing, and participated more in the course.

CMC for Promoting Collaborative Language Learning

In recent years, Web-based online chats have become a widely used communication tool, especially for fostering collaborative interaction. As suggested by Freiermuth (2002), online chat can be a useful tool for collaborative activities in the language classroom. Warschauer (1997) claimed that the pauses in the text-based mode permitted students to reflect on the written discourse while practicing rapid interaction. Another feature of online learning is that many-to-many communication allowed group members to initiate interaction with another, thus creating opportunity for a group of people to construct knowledge together. Due to time- and place-independence of CMC, users were allowed to write and access messages at any time and sustain communication outside the classroom. The long distance feature of CMC enabled students from different schools to interact simultaneously. In recent years, long distance collaboration has been well established in Europe. The final feature of CMC was that hypermedia links could be incorporated into collaborative activities. For instance, students could work collaboratively to plan travel activities by gathering information from websites.

To augment student interaction and collaboration, Paramskas (1995) used a conferencing system to which students posted messages and discussed assignments. This research involved three case studies in French classes. In the first case, conferencing-based tasks (summarizing ideas via bulletin boards and authoring notes via e-mail) were assigned to the students; as for the second case, the students discussed topics in the computer conference, generating 400 messages related to the course content; in the third case, group research papers were posted to the classroom conference for critique and discussion. As a primary effect, student collaboration was fostered since in CMC collaborative tasks they shared and exchanged their ideas.

Online results have been reported to be positive concerning the improvement of

argumentation in collaborative activities. McAlister, Ravenscroft, & Scanlon (2004) presented an educational design for synchronous online peer discussion that enhanced collaborative knowledge. This design included a phased collaborative learning activity, including offline preparation (considering sessions), online group collaboration (comparing and debating sessions) and offline discussion (consolidating and summarizing sessions). In the phase of online group collaboration, students checked their understanding of the issues by challenging others' perspectives and defending their own positions. In this way, they constructed knowledge about issues, and developed alternative views through collaborative reasoning. Based upon a data set of four online discussions, the preliminary results showed that online collaboration supported students to produce deeper and more extended argumentation.

Comparison of CMC and Face-to-face Learning Modes

With the increasing popularity of CMC, some studies have attempted to examine a variety of issues between CMC and face-to-face class discussion. These issues include students' online interaction, language production, participation equality, oral proficiency, and thinking ability.

One of the first studies comparing CMC and face-to-face learning modes was reported in Kern (1995). In this study, the researcher compared the quantity and characteristics of the discourse produced in the synchronous communication as opposed to face-to-face conversation. Forty students in a French course participated in this study, engaging in Interchange discussions to study grammar structures and assigned readings. Data were collected from three sources: transcripts of synchronous discussions, transcripts of oral discussions, and students' and teachers' responses to a questionnaire. According to data analysis, there were striking differences in quantity and quality of language production between *InterChange* discussions and oral

discussions. It was revealed that the learners exhibited more discourse functions as well as morphosyntactic features in the *InterChange* condition.

To test the claim that CMC could result in equal participation among students, Warschauer (1996) conducted an experiment comparing equality of participation in the face-to-face mode and the electronic mode. The subjects in this study were sixteen ESL students in an advanced composition class, discussing questions in a counterbalanced way. As for data collection, face-to-face discussions were recorded and transcribed, while electronic discussions were saved verbatim on the computers. The transcripts were then analyzed to compare student participation and language complexity by Gini coefficient, type-token ratio, and coordination index. The findings showed a tendency toward more equal participation in the electronic mode, in which students used more lexically and syntactically complex language. Another important finding of Warschauer's study was that learners' thinking ability was assisted by the effective discussion-stimulating tool.

With regard to the rapid nature of electronically assisted and student-driven discourse, Beauvois (1998) examined the differences of CMC mode and face-to-face mode. In the context of an intermediate French course, forty-one undergraduate students attended at least two lab sessions in addition to regular classroom discussions. The electronic exchanges, as well as classroom discussions, were recorded for data analysis. The transcripts of network sessions revealed that students produced much more interactive conversation with complex sentence structure, and participated more in the electronic discourse. It was also indicated that the slow motion of the communicative process provided a lower anxiety environment, in which the learners treated topics more thoroughly and deliberately.

In addition to these studies exploring written differences in the electronic setting and face-to-face communication, the aspect of oral proficiency in the two modes of

communication was investigated by Payne & Whitney (2002). This quasi-experiment involved fifty-eight students from four sections of Spanish courses, in which the students were divided into four groups: two experimental groups receiving extra online periods and two control groups receiving face-to-face instructions. Based upon the scores on the non-word repetition task and the reading span test, differences in oral proficiency development among the four groups were examined. The results indicated that participants spending a half of time in synchronous discussions were advantaged in their oral skills over those receiving face-to-face instructions only. Thus it was implied that synchronous CMC was beneficial for promoting oral skills among foreign language learners.

To synthesize findings from the studies previously mentioned, this means of communication differed fundamentally from classroom-based instruction with respect to participation, motivation, interaction, language production and thinking ability. As concluded by Payne & Whitney (2002), synchronous CMC offered a variety of benefits to second language learners that may be difficult to obtain in classroom-based instructions. Table 2.2 lists the alleged benefits of CMC over face-to-face conversation.

Table 2.2

Advantages of CMC Mode over Face-to-face Mode (Kern, 1995; Warschauer, 1996; Beauvois, 1998; Payne & Whitney, 2002)

Advantages
a) more student-initiated interaction
b) greater amount of language production
c) more syntactically complex output
d) reduced anxiety
e) enhanced motivation
f) encouragement of collaborative spirit
g) positive effects on writing ability as well as oral skills

h) more balanced participation i) increased participation j) enhanced thinking ability

Critical Thinking in L2 Education

As suggested in previous studies, one notable issue of CMC mode is its potential to enhance thinking ability. Electronic discussion is found to enable to improve the students' thinking ability (Warschauer, 1996). This claim has inspired some researchers to investigate the potentials of CMC for teaching thinking skills in the field of L2 education and language teaching in recent years. However, researchers have questioned if it is appropriate to teach critical thinking in ESL classrooms. Discussions in this area have already generated debates over the inclusion of critical thinking in the curricula of L2 composition courses. Before addressing the core issues in the debate over the inclusion of critical thinking in L2 curricula, various meanings and definitions appended to critical thinking are briefly examined.

Definition of Critical Thinking

In the literature, a myriad of definitions have been proposed to describe critical thinking. According to Daniel (2003), critical thinking can be defined by three predominant research areas:

1. Philosophy, which stresses the applications of logic to the problems of everyday life including education. For instance, Ennis (1987) characterized critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (p. 2). This definition included formulating alternative ways of viewing problems, questions, possible solutions, and plans for

investigation.

2. Psychology, which conceives of critical thinking as a separate aspect of the cognitive domain that ranges from comprehension, application, analysis, synthesis, and evaluation. Sigel (1984), a prominent figure in psychology, regarded critical thinking as “an active process involving a number of denotable mental operations such as induction, deduction, reasoning, sequencing, classification, and definition of relationships” (p.118).
3. Education, which focuses on the kind of thinking involved in solving problems, formulating inferences and making decisions in a thinking task. By critical thinking skills, Davidson (1994) referred to “the capacity to create and analyze proofs or arguments by making sound use of evidence and logic” (p. 20). Such skills included the ability to construct a coherent chain of reasoning and also the ability to evaluate sources of information for their relative objectivity, coherence, and validity.

The preceding discussions clearly demonstrated that philosophers, psychologists, and educators have proposed various definitions for critical thinking. To capture the main concept, Diane (1997) defined critical thinking as “the use of those cognitive skills or strategies that increase the probability of a desirable outcome” (p. 4). After reviewing the origins, applications, and limitations of critical thinking for postsecondary ESL students, Curry (1999) proposed a synthetic concept of critical thinking that incorporated the skills from the fields of philosophy and psychology. In other words, critical thinking could be regarded as the applications of cognitive functions such as analysis, synthesis, and evaluation to the problems of everyday life including education.

Debates over the Inclusion of Critical Thinking in L2 Curricula

Despite overlaps and similarities in the definitions of critical thinking, the theorists have held divergent views on the value of including critical thinking in L2 curricula. A group of researchers (Atkinson, 1997; Ramanathan & Kaplan, 1996) have assumed that critical thinking is an ineffable notion immersed in shared cultural knowledge. Nevertheless, Another group of researchers (Davidson, 1998; Benesch, 1999; Gieve, 1998; Zamel, 1997) have considered that critical thinking is a clearly definable notion that can be taught to nonmainstream groups.

Opponents of the Inclusion of Critical Thinking in L2 Curricula

For the first group of researchers, Ramanathan & Kaplan (1996) assumed that critical thinking was predicated upon the extent that the students were acculturated to mainstream values in the U.S. culture. By analyzing L1 composition texts, they found that some culturally constrained notions such as voice, audience, and critical thinking were inaccessible to students who had not been cultivated in the U.S. culture. As a result, the authors viewed the acquisition of thinking skills as an unconscious process that might be problematic for language learners whose L1 was not English. Drawing from this study, it was inappropriate to teach critical thinking to ESL student writers.

Atkinson, as a major figure in this group, claimed that teaching critical thinking might be potentially problematic in the ESL classroom. In his influential work, Atkinson (1997) attempted a critical exploration of critical thinking, offering four reasons why TESOL educators should be cautious about adopting critical pedagogies in L2 settings. To begin with, he argued that critical thinking was a social practice unconsciously learned in the early socialization of mainstream children. Since it was an unconscious process, people seemed unable to define critical thinking clearly. The second argument was concerned with the nature of critical thinking, which Atkinson

regarded as exclusive and reductive. The third reason why it might be inappropriate to teach critical thinking was that some U.S. cultural assumptions underlying critical thinking differed from various values in other cultures. Therefore, he questioned if individuals with different modes of expression and notions of individual might benefit from thinking skill instructions. A fourth and final issue regarding critical thinking was that the researchers failed to confirm the transferability or generalizability of thinking skills. Since transfer was difficult to measure, Atkinson held that "TESOL educators should approach the critical thinking bandwagon with care and caution" (p. 87).

Advocates of the Inclusion of Critical Thinking in L2 Curricula

On the other side were those who believed that critical thinking was a clearly definable notion that could be taught to nonmainstream groups (Davidson, 1998; Benesch, 1999; Gieve, 1998; Zamel, 1997). In a response to Atkinson's critique, Davidson (1998) presented two different perspectives with regard to definition and cultural issues. For the definition issue, in contrast to Atkinson's claim that people had not defined critical thinking clearly, Davidson contended that the definitions offered by numerous researchers generally conveyed the same idea. As for the cultural issue, Davidson indicated that in literature none of these definitions related critical thinking to culture, which Atkinson believed to equate with critical thinking. By providing ample evidence from empirical studies, Davidson confirmed that critical thinking could be taught to nonmainstream groups.

Rather than focusing on discrete aspect of language, culture, and discourse, Zamel (1997) urged the importance of transculturation that celebrated "the selective, generative and inventive nature of linguistic and cultural adaptation" (p. 350). In a collaborative work with her colleagues, she immersed L2 students in reading and

writing that required them to challenge views and provide their own perspectives. Based upon students' reflections on their learning processes, she found that writing in English had facilitative effects on critical thinking. For instance, one student from Vietnam stated that English encouraged him to write and think in a critical way that he had not experienced in L1. The picture emerged from students' reflections was that L2 students were able to adopt critical stances and take individual positions while adapting to the Western culture.

While Zamel challenged the reductive character of nonnative students, Gieve (1998) proposed a dialogic approach to teaching thinking skills. In her study, Malaysian students were encouraged to examine the reasons for their claims and beliefs, and to question themselves, their peers, and their teachers. This dialogic process allowed students to debate and uncover assumptions and presuppositions in argumentation. Gieve promoted this type of thinking as a powerful tool for dissent across cultures and classes, not just in the Western societies.

Drawing inspiration from Gieve, Benesch (1999) demonstrated a close analysis of dialogic critical thinking in the classroom discussion. The primary concern of this research was that teaching critical thinking dialogically allowed students to consider various viewpoints. From the researcher's perspective, critical thinking could be taught to students through encouragement. By contrast, choosing not to teach critical thinking may lead to unquestioning acceptance of assumptions and intolerance of dissent and change. The current debate about the inclusion of critical thinking in L2 curricula is outlined in Table 2.3.

Table 2.3

Key Issues of Inclusion of Critical Thinking in L2 Curricula

Key Issues	Opponents (Atkinson, 1997; Ramanathan & Kaplan,	Advocates (Davidson, 1998; Benesch, 1999;

	1996)	Gieve, 1998; Zamel, 1997)
Definition	Critical thinking is an ineffable notion that people cannot define clearly	Critical thinking is a clearly definable notion
Culture	Critical thinking is cultural thinking, which is more in the nature of a social practice	Critical thinking is universally relevant than just a social practice
Transferability	Teaching critical thinking may be potentially problematic in ESL/EFL classrooms	Critical thinking instruction can be applied with encouraging results in ESL/EFL contexts

Critical Thinking in L2 Classroom-based Mode

Although the debates of critical thinking mentioned in previous sections has not reached any agreement, the issue—critical thinking—has inspired a number of studies to discover whether critical thinking can be taught to ESL/EFL students in classroom-based contexts (*e.g.*, Chamot, 1995; Pally, 1997; Davidson & Dunham, 1997). According to Chamot (1995), L2 instructors should develop a community of thinkers in the ESL/EFL classroom by following five principles. To begin with, instructors needed to relate students' prior knowledge to their current learning in English. The second principle was to provide meaningful learning tasks from different subject areas in the language classroom. After providing meaningful tasks, instructors worked together with students to discover and create their understanding and skills. At the fourth stage, teachers explicitly demonstrated students how to use strategies that helped them learn efficiently. The final principle to be followed was that instructors should help students evaluate their own learning by reflecting on their accomplishment and assessing the effectiveness of the strategies used.

With regard to pedagogical approach of critical thinking, Pally (1997) advocated using sustained content to develop thinking skills in ESL learners. In this article, she

offered three directions for implementing sustained content in classroom-based instructions. This researcher suggested ESL teachers might develop classes examining differences in critical thinking and expository writing among different cultures. To achieve this goal, teachers could provide controversial articles for students to examine the organizational structures of the assigned texts and to evaluate the arguments of each reading. Also, films could be used in ESL composition courses for its wide involvement in politics, economics, and social relations. Pally believed that students would be able to develop critical thinking while exploring unresolved issues.

By using the Ennis-Weir critical thinking essay test, Davidson & Dunham (1997) examined whether critical thinking could be taught through explicit instruction in the ESL context. This experimental study involved thirty-six undergraduate Japanese students in an intensive academic English course. The participants were divided into two groups: the treatment group enrolling in the critical thinking seminar, and the control group without enrollment in the critical thinking seminar. For the seminar session, the treatment group explored basic elements of critical thinking such as source incredibility and assumption-identification. After a year of instruction, students' progress in critical thinking was assessed and compared using Ennis-Weir critical thinking essay test. They found that the treatment group with additional training in critical thinking outperformed the control group with regard to test scores and individual paragraph scores. Accordingly, it was suggested that training in thinking skills could be effectively combined with EFL/ESL instruction.

Critical Thinking in L2 Settings via CMC Mode

Previous studies have emphasized the importance of promoting critical thinking as an integral part of English language pedagogy in classroom-based contexts. However, in online environment, few studies have been carried out in the area of

including thinking skills into EFL/ESL instruction. Among these few, McAlister, Ravenscroft, and Scanlon (2004) observed L2 learners' critical discourse in online debating sessions to see if critical thinking could be promoted in online environment. It was found that during online debating sessions, students checked their understanding of the issues by challenging others' perspectives and defending their own positions. In addition, they constructed knowledge about issues, and developed alternative views through online collaborative reasoning. They concluded that L2 learners' thinking skills may be promoted in online debating sessions via synchronous CMC.

Bloch's (2004), on the other hand, found that in online free discussion non-native speakers of English were able to develop alternative forms of rhetoric, deeply expressing their arguments and viewpoints. By tracing an online discussion topic responding to a television show regarding alleged Chinese spying and analyzing 153 messages in Usenet,[1] he found that these Chinese writers adopted four rhetorical strategies. The first strategy emerged from Chinese writers' arguments was to reflect both the interests of the individual and[1] the interests of the group. After connecting the relationship, they developed a collective interpretation of an issue. This collective interpretation might incorporate the Chinese rhetorical forms and the architecture of the Internet, known as cyber cross talk. The last strategy they used was organizing responses collectively so as to take action for the issue and the problem being raised. The features identified above offered a unique insight into the nature of thinking skills that Chinese writers exhibited as they were required to use English in online discussions.

McAlister et al.'s and Bloch's studies provided positive results concerning

1Usenet is a worldwide information distribution system containing numerous newsgroups, usually organized around specific topics.

enhancement of thinking skills in different types of online discussion—online debate and online free discussion. However, the extent of how EFL students' critical thinking is developed in online debate and online free discussion has not been determined and compared. Also, little research attempts to examine if EFL students' interaction patterns may vary in different types of online discussion. Given the unresolved issues, more research is needed to determine the extent of how critical thinking is developed in different types of discussion, and to compare the degree that critical thinking and interaction patterns may vary in different types of discussion.

To address the issues, the present study incorporated two types of online discussion—online debate and online free discussion. Two models were adopted for analysis of interaction patterns and critical thinking: 1) Henri's (1991) Interactive Behavior Model and communicogram drawings to determine the interaction patterns, and 2) Garrison, et al's (2001) Practical Inquiry Model to determine critical thinking in the two types of online discussion.

In the L1 context, Garrison et al. (2001) developed the Practical Inquiry Model to examine students' critical thinking in distance education. The Practical Inquiry Model comprised four phases of cognitive presence (triggering event, exploration, integration, and resolution) in a critical community of inquiry. Cognitive presence represented a cyclical concept of critical thinking: producing a triggering event, exploring relevant information, integrating ideas, and resolving problems (Garrison et al., 2001).

As for the analysis of interaction patterns, Henri (1991) developed the Interactive Behavior Model. The analytic model allowed us to distinguish between two types of interaction:

1. interactive messages: those messages that answer a previous statement with reference to the theme of the teleconference, and with connection to one or

more other messages.

2. non-interactive or independent messages: those messages that relate to the theme of the teleconference, but are not connected to other messages (p.152).

In order to be more specific, communicograms (Henri, 1991) were also created to indicate the flow of discussion and the direction of the postings. According to Henri, a communicogram is "a visual representation of the exchanges for each teleconference (p.155)." It indicated the development of discussion flow for each type of discussion and revealed if the links between messages were interactive or independent.

Based on the two models, the researcher analyzed and compared students' interaction patterns and phases of cognitive presence in the two online discussion types (online free discussion and online debate).

CHAPTER THREE

METHOD

The present study attempted to investigate EFL undergraduates' interaction patterns and cognitive presence in two types of online discussion— free discussion and debate, via asynchronous discussion sessions. Additionally, the relationship between interaction patterns and cognitive presence was further examined. This chapter presents the participants and the study settings, the study design, data collection, and the approaches of data analysis.

Study Setting

The study was conducted in an English writing course at a public university in Taiwan. This course aimed to help college students exchange opinions with their peers on the issues discussed in English via an online system, E3 (A detailed description of the online system will be provided later). Also, the course helped the students gain basic concepts of and skills of formal writing through various peer and tutoring revision process. Furthermore, to provide extra writing opportunities, the students were required to participate in online forum discussions. The online discussion was a required activity, comprising a portion of the students' final grades. As for the course content in regular in-class sessions, the syllabus included six units: narrating paragraph, describing, analyzing reasons, comparing and contrasting, and evaluating effects. In the online sessions, the discussion topics assigned were English learning, Truman show, and career and dream.

Participants

The participants in the study were thirty undergraduate students enrolling in the

elective writing course. Their ages ranged from eighteen to twenty-two. Among these thirty students, fifteen of them were males, and the other half were females. Four of the students were freshmen and sophomores, and the rest of them were juniors and seniors. Except two English majors, twenty-eight were non-English majors, mostly from science and technology fields. Based on the background questionnaire, they took this elective course primarily to fulfill English credits required for graduation, which included 2 Freshman English courses and at least one elective English or other foreign-language courses.

At the beginning of the semester, the researcher recruited the students as the study participants and asked them to sign a consent form (see Appendix A). They then filled out a background questionnaire (see Appendix B). The results of the background questionnaire revealed that twenty-eight of the students (93.3%) had the experience of chatting online in Chinese, all of them had ever posted messages online, while twenty of them (66.7%) had engaged themselves in a classroom-based discussion forum. As for their English proficiency levels, twenty-four of the students reported having passed the first stage of General English Proficiency Test at high-intermediate level, including reading and listening comprehensions. In a self-evaluation of their own English writing and reading ability, seventeen of the participants (56.7%) rated their writing ability at the intermediate level, while twenty of them (66.7%) rated their reading ability at the intermediate level. For descriptive convenience, all the students were numbered from 1 to 30.

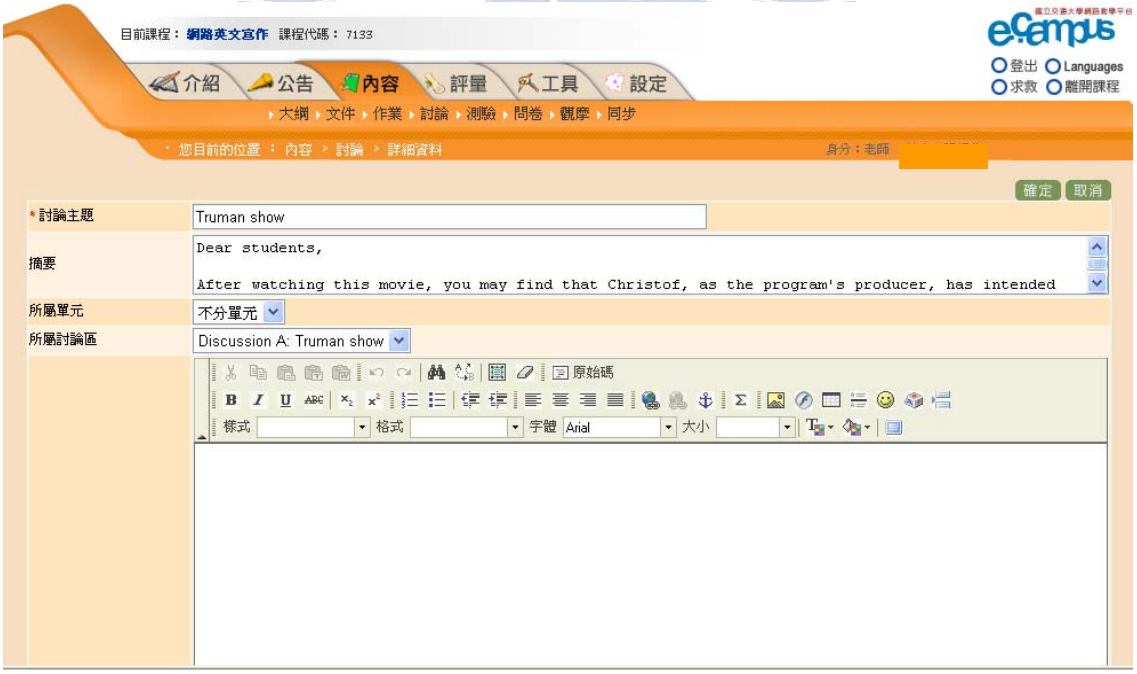
Online System

The course adopted an online system, E3, which was developed by the university as an important class delivery system for e-learning and distance education (see Figure 3.1). E3 provided several functions—First, the time-and place-independent

communication allowed the participants to contribute and retrieve messages at any time. Second, E3 provided an online environment which allowed many-to-many communication creating the opportunity for group members to interact with each other. Third, the time-delayed communication mode allowed the participants to take their time to reflect on their written discourse. Other distinctive functions of E3 included grouping and mapping; that is, via E3 the participants could be easily divided into several virtual groups, and the direction of postings could be displayed by tree maps.

Figure 3.1

The Discussion Forum of E3



Study Design

Previous studies have suggested that L2 learners' critical thinking can be promoted in online debate (McAlister, Ravenscroft, & Scanlon, 2004) and online free discussion (Bloch, 2004). However, neither of these studies compared and examined the extent critical thinking occurs in online discussions, and the degree of students'

critical thinking might vary in different types of online discussion. Accordingly, this study attempted to investigate L2 learners' cognitive presence in two types of online discussion— free discussion and debate.

In this study, free discussion was operationally defined as a discussion format where the students enjoyed full freedom in discussing topics without inhibitions (Courtney, 1996). They were encouraged to freely express their personal opinions on a discussion topic assigned. Debate, on the other hand, was defined as to a discussion format where the students were encouraged to provide reasonable argument for and against a given proposition (Freeley, 1990). Based on the definitions, the instructions and guiding questions for the two types of online discussions were designed. The topics in the two types of discussion were selected in consultation with the class instructor to correspond with the objectives of the writing course.

Pilot Study

To test the appropriateness of the data analysis, a pilot study was first conducted to examine the online discussions of twenty-eight students in an English writing class where the students experienced online free discussion and online debate on two different topics. The online discussion logs were analyzed by Henri's (1991) Interactive Behavior Model and Garrison, et al's (2001) Practical Inquiry Model.

Based on the analysis, the researcher found that a complete message was not an appropriate analytical unit since the online logs often addressed more than one theme. Furthermore, the coding results reflected discussion types resulted in different levels of cognitive presence. Following the coding procedure and the findings in the pilot study, the main study then aimed to divide the students into different groups to engage in free and debate discussion simultaneously but to discuss the same assigned topics.

Main Study

According to Schellens & Valcke (2006), a group of 10 to 12 participants invoked moderate load for online discussion and knowledge construction. To avoid an overwhelmed online discussion load, the participants were randomly assigned to three groups consisted of 10 members respectively, engaging in two types of online discussion—free discussion and debate. All of the predetermined types of discussion and topics are outlined in Table 3.1 (see Appendix C for detailed description of guiding questions for discussion). As shown in Table 3.1, there were totally three rounds of discussion, and each round lasted for two weeks. During each round, two of the three groups simultaneously discussed the same topic with different guiding questions to facilitate discussions in both free discussion and debate. After each round of discussion, the topic shifted to another one. The groups took turns participating in each round of discussion until they all experienced these two online discussion types. For instance, in week 7 and 8, Group C was assigned to discuss the same topic with Group A, who changed from free discussion to debate; for the second round, Group C was changed from free discussion to debate, discussing another topic with group B in free discussion. During the three rounds of discussion, the instructor did not play an active role. Instead, some of the group members played the role as mediators, responsible for leading the online discussions.

Table 3.1

Predetermined Types of Discussion and Topics

	Week 4-5: English Learning	Week 7-8: Movie (Truman show)	Week 12-13:Career and Dream
Free Discussion	Group A	Group C	Group B
Debate	Group B	Group A	Group C

Data Collection and Data Analysis

In the present study, the data collection included a background questionnaire and the online discussion logs. The background questionnaire included questions about their experience in using web-based communication tools, and their English proficiency levels (see Appendix B). The online logs and postings were collected through the three rounds of online discussion.

Online discourse was analyzed based on: 1) Henri's (1991) Interactive Behavior Model and communicogram drawings to determine the interaction patterns, and 2) Garrison, et al's (2001) Practical Inquiry Model, modified by Pawan, Paulus, Yalcin, & Chang (2003) to determine the phases of cognitive presence exhibited in the two types of online discussion. Additionally, the relationship between interaction patterns and cognitive presence was examined. In the following section, the analytic framework and method for analyzing interaction patterns are presented.

Analysis of Interaction Patterns

To address the first research question—the differences of interaction patterns in EFL college students' online discourse through two types of online discussion (free discussion and debate), the online discussion logs were analyzed according to the Interactive Behavior Model developed by Henri (1991). The analytic model allowed us to distinguish between two types of interaction: interactive messages and non-interactive or independent messages. In order to be more specific, communicograms (Henri, 1991) were also created to indicate the flow of discussion and the direction of the postings.

Similar to Henri's study, the present study investigated text-based communication in an educational context, and particularly, attempted to compare patterns of interaction provoked by differing designs. Therefore, Henri's model was

selected as a tool to establish the patterns of interaction since it was developed for the context that fitted into the present study.

A speech segment rather than a complete posted message was used as the unit of analysis. A speech segment was adopted in the study for it was the most useful unit for coding some messages contained several themes. A speech segment was defined by Henri and Rigault (1996) as "the smallest unit of delivery linked to a single theme, directed at the same addressee, identified by a single type, having a single function" (p.62). The following example demonstrated a message which addressed two themes:

Segment 3.1

I agree that to learn English well, studying abroad is the best way. I have a senior high school classmate, who had studied junior high school in the US for three years. He is very good at English reading, writing, listening, or speaking. When we were senior high school students, he could talk with our English teacher in English fluently.

Segment 3.2

But just like many classmates mentioned before, economy is a big problem when we study aboard. As a college student, I also agree that saving money from many ways is a good idea. Not only study English, but also experience a lot of different things like cultures or life in the world.

Segment 3.1 dealt with the best way to learn English well. Segment 3.2 was concerned with the financial problem in learning English abroad. Accordingly, the message addressing two different themes was coded into two segments. After deciding the segments, the percentages of independent and interactive messages in free discussion and debate were calculated and compared by descriptive statistics. Finally, the communicograms were drawn to visually indicate the interactive chains among messages.

Analysis of Cognitive Presence

To address the second research question—the differences of cognitive presence in EFL college students' online discourse through two types of online discussion (free discussion and debate), online discourse logs were coded according to Garrison, et al's (2001) Practical Inquiry Model, modified by Pawan, et al.(2003). The modified version was adopted in the study because in their study the speech segment was identified as the unit of analysis, which was reasonable to analyze a whole message which may contain several themes.

Based on the Practical Inquiry Model, the online logs were categorized into four phases of cognitive presence: a) the triggering phase in which participants "posted questions that recognize an issue, dilemma, or problem"; b) the exploration phase in which participants "grasp the nature of the problem", and move to a deeper sharing of information; c) the integration phase in which discussions move from "sharing information to constructing meaning and synthesizing ideas"; and d) the resolution phase that "represents a resolution to the issue, dilemma, or problem presented in the first phase" (Garrison et al., 2001, p.11). Detailed description for the refined coding categories, definitions and indicators is presented in Table 3.2.

Table 3.2
Practical Inquiry Model (adapt from Garrison et al., 2001, modified by Pawan et al., 2003)

Descriptor	Indicators	Sociocognitive Processes
Phase 1 Trigger events (evocative)	1.1 Recognizing the problem	1.1.1 Presenting background information that culminates in a question
	1.2 Sense of puzzlement	1.2.1 Asking questions 1.2.2 Messages that take discussion in new direction

Phase 2 Exploration (tentative)	2.1 Divergence—within the online community	2.1.1 Unsubstantiated contradiction of previous ideas
	2.2 Information exchange	2.2.1 Personal narratives/descriptions/facts (not used as evidence to support a conclusion)
	2.3 Suggestions for consideration	2.3.1 Author explicitly characterizes message as exploration
	2.4 Brainstorming	2.4.1 Adds to established points but does not systematically defend/justify/develop addition
	2.5 Leaps to conclusion	2.5.1 Offers unsupported opinions
Phase 3 Integration (provisional)	3.1 Convergence	3.1.1 Reference to previous message followed by substantiated agreement
		3.1.2 Building on, adding to others' ideas
	3.2 Convergence (tentative solutions)	3.2.1 Justified, developed, defensible, yet tentative hypotheses
	3.3 Connecting ideas, synthesis	3.3.1 Integrating information from various sources—textbook, articles, personal experience
	3.4 Creating solutions	3.4.1 Explicit characterization of message as a solution by participant
Phase 4 Resolution (committed)	4.1 Vicarious application to 4.1 Vicarious application to real world	4.1.1 None
	4.2 Testing solutions	4.2.1 Coded
	4.3 Defending solutions	

Using a speech segment as the unit of analysis, the phases of cognitive presence in free discussion and debate were identified. The following example included

reference to previous messages, and thus demonstrated a message which was coded as Phase 3 according to the Practical Inquiry Model:

> Segment 3.3: Phase 3 (by S25)
>
> I think we have many resources to help us study English now in Taiwan, but I believe that there are still some problems. First, *like S10 said*, we don't have strong motivation to learn English well in Taiwan than in an English speaking country. But I think if you cannot find much information in Chinese, then it might be a good motivation to learn English by searching English information. For example, I love jazz, there are really few jazz books or online resource was written in Chinese. And *S1's online game* is also another example. I think the most difficult problem is we don't know the way native people speak English. Sometimes the grammar is correct, but they just don't use it that way.

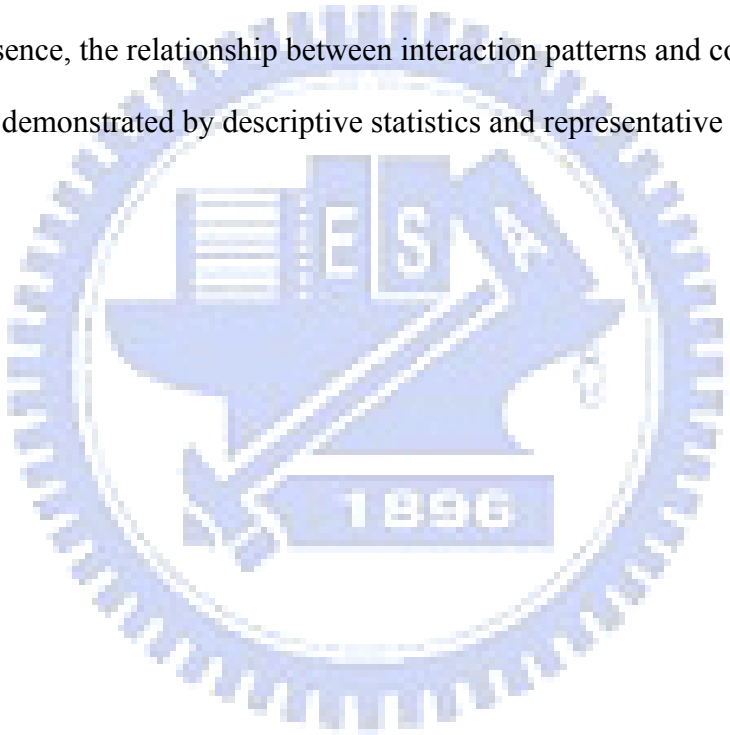
In Segment 3.3, S25 apparently built his ideas on these two colleagues—S10 and S1. He not only explicitly connected his posting to previous statements but also constructed meanings in an integrative way. These features constituted a typical discussion unit at Phase 3.

To evaluate the validity of the coding categories, the researcher and the second coder from the master's program of TESOL randomly selected 15% of the online postings and independently coded the selected postings according to the Practical Inquiry Model. They carefully read the coding categories and established an inter-rater reliability of 82% for parsing cognitive presence. Based upon the preliminary coding results, they determined the appropriateness of the model. No modifications were made in the process. Then they continued coding the rest of the data. For this analysis, they established an inter-rater reliability of 87% for cognitive categories. The coding discrepancy was discussed and resolved by a third rater. Instances of cognitive presence were then calculated and gathered from the three groups in each type of discussion. Subsequently, the calculated percentages were compared by descriptive

statistics to examine if there were differences of cognitive presence between the two types of online discussion.

Analysis of the Relationship between Interaction Patterns and Cognitive Presence

To address the third research question, the relationship of the two variables—interaction patterns and cognitive presence was further examined. After calculating the percentages of interactive and independent messages in each phase of cognitive presence, the relationship between interaction patterns and cognitive presence was demonstrated by descriptive statistics and representative examples.



CHPATER FOUR

RESULTS

In this chapter, the findings were presented based on the three research questions.

Research Question 1: What differences of interaction patterns can be found in EFL college students' online discourse through two types of online discussion — free discussion and debate?

To address the first research question, online discourse was analyzed according to the Interactive Behavior Model (1991), which aimed to distinguish between interactive and independent messages. Table 4.1 shows the percentages of interaction patterns in free discussion and debate.

Table 4.1
Percentages of Interaction Patterns in the Two Online Discussion Types

Interaction Patterns	Online Discussion Types	
	Free Discussion (n=44)	Debate (n=42)
Independent Messages	72.7%	50.0%
Interactive Messages	27.3%	50.0%

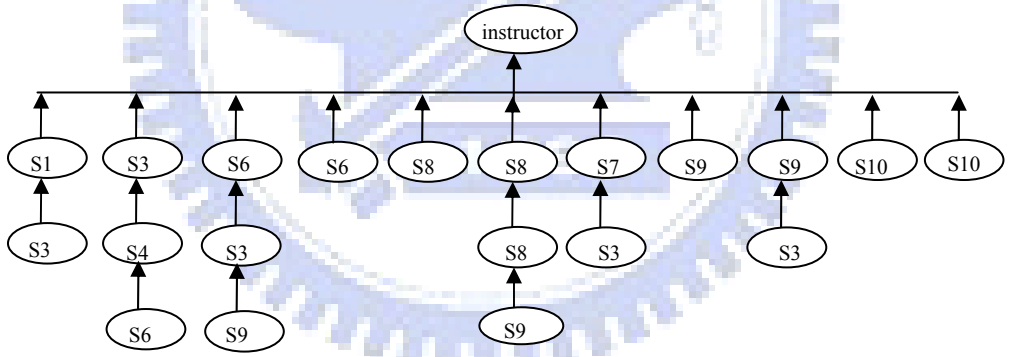
As shown in Table 4.1, it is found that in free discussion, the majority of the discussions (72.7 %) are in the form of independent messages while 27.3% of the total units are interactive messages. However, in debate, independent messages (50.0%) and interactive messages (50.0%) accounted for equal proportions. The results seemed to indicate that in free discussion, most students posted more independent messages than interactive ones. However, the difference in distributions of both messages in debate seemed to be minimal.

To closely examine the interaction patterns in both discussion types, the technique of communicograms (Henri, 1991) was used to indicate the flow of discussions and the direction of the postings under each topic. In Figures 4.1, 4.2, and 4.3, the arrows refer to the directions of the postings, and the lines connecting the messages signify interactive links showing the interactive chains. The following communicograms accompanied by interpretive explanations would illuminate the interaction patterns in collaborative dialogue throughout the three rounds of online discussion.

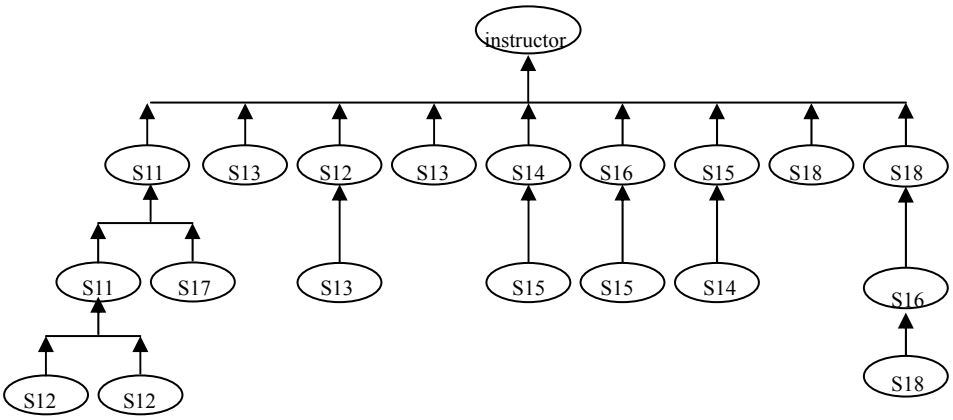
Figure 4.1

Communicograms of Online Free Discussion and Debate (1st Topic: English Learning)

a. Free Discussion



b. Debate



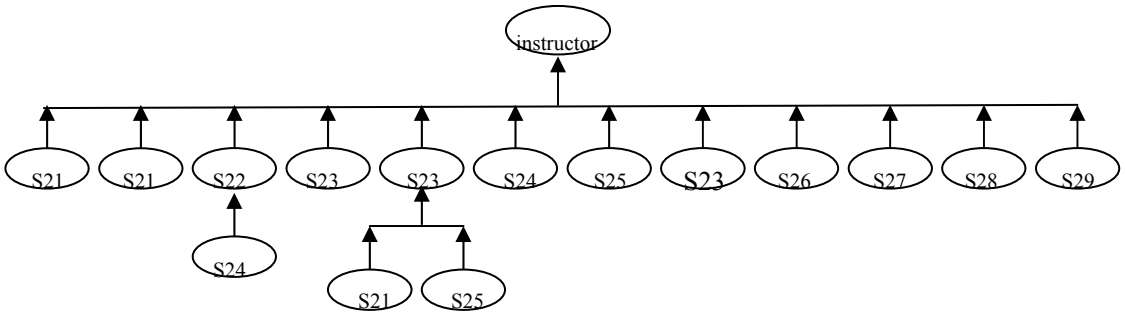
In the first round, two groups discussed about *English learning* in free discussion and debate respectively. The slight differences of discussion flow and interactive chain in the two types of discussion are visually presented in Figure 4.1a and 4.1b. Generally, in free discussion the participants seemed to simply respond to the initial prompt. Conversely, in debate they tended to contribute more time to comment on other participants' statements. The diagram seemed to show complex interactive chains.

In free discussion, only half of the discussions were followed by individual participants. By contrast, in debate, more than half of the independent messages were developed into interactive messages by group members. In the sense, debate might seemingly intrigue more interactive links between messages than free discussion.

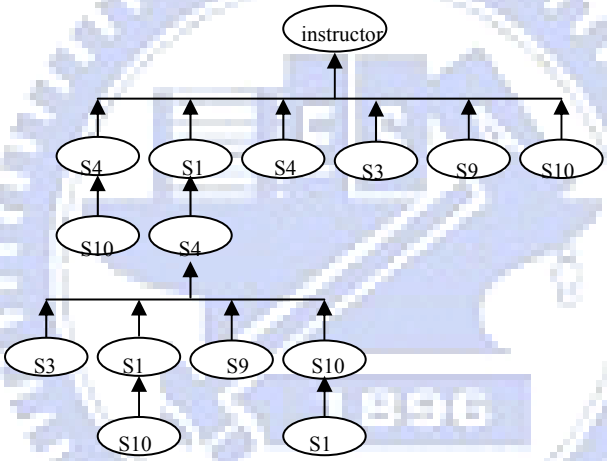
Figure 4.2

Communicograms of Online Free Discussion and Debate (2nd Topic: Truman Show)

a. Free Discussion



b. Debate



In the second round, two groups discussed about *Truman Show* in free discussion and debate respectively. As shown in Figure 4.2a and 4.2b, the development of discussion flow and interactive chains in the two types of discussion seem to be slightly different. The discussions in free discussion were generated in the form of independent messages, with few connections to others' contributions. However, the postings in debate centered on interactive messages, which were related to other members' ideas and leading to further statements.

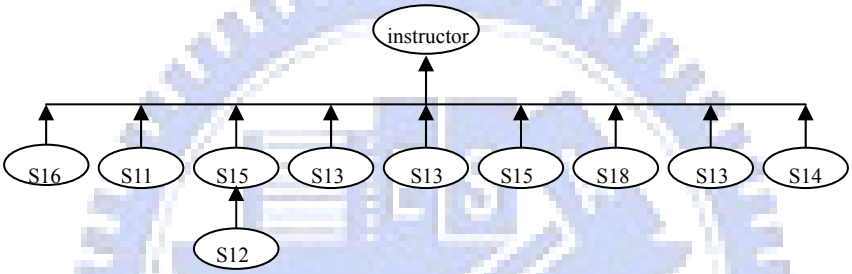
In free discussion the topic was initially discussed by a number of individual members. Among these independent messages, however, only two were further

discussed by other members at two-way interaction. On the contrary, in debate the members were more involved in connecting previous ideas and postings to their present arguments, and eventually the threaded discussion was developed into multiple interaction containing 4 interactive messages.

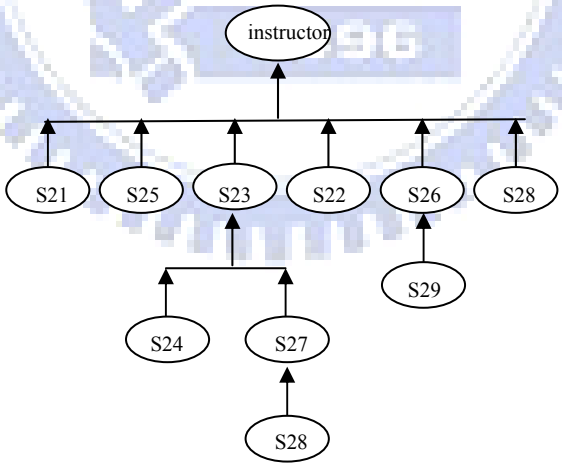
Figure 4.3

Communicograms of Online Free Discussion and Debate (3rd Topic: Dreams and Ccareer Goals)

a. Free Discussion



b. Debate



In the third round, two groups discussed *Dreams and Career Goals* in free discussion and debate, respectively. The development of discussion flow and interactive chain in the two types of discussions appear to be different, as shown in

Figure 4.3a and 4.3b. Similar to the second round, the network of interaction in debate seemed to be more complex than free discussion.

In free discussion, several individuals contributed the initial postings. Among these 9 independent messages, however, only one aroused other members' further discussions. As a result, interaction in the third round for free discussion was relatively rare. Contrarily, in debate the members were more devoted to presenting their viewpoints according to previous statements.

In sum, the communicograms shown in Figures 4.1, 4.2, and 4.3 indicate that the flow of discussions and the direction of the postings in these two types of online discussion seem to be slightly different. In free discussion, the majority of postings appeared to be generated in one-way interaction, whereas in debate the discussions tended to form a more complex network of interaction in two-way interaction, or multiple interaction including 3 or more levels of interaction.

Research Question 2: Do EFL college students perform different phases of cognitive presence in online discourse through two types of online discussion—free discussion and debate?

To address the second research question, online discourse was coded according to Garrison et al.'s (2001) Practical Inquiry Model and examined by descriptive statistics. Table 4.2 shows the percentages of phases of cognitive presence in free discussion and debate.

Table 4.2

Percentages of Cognitive Presence in Two Online Discussion Types

Phases of Cognitive Presence	Online Discussion Types	
	Free Discussion (n=44)	Debate (n=42)
Phase 1 Trigger	20.0%	16.7%

Phase 2 Exploration	68.9%	64.1%
Phase 3 Integration	11.1%	19.2%
Phase 4 Resolution	0.0%	0.0%

Similar to the findings of Garrison et al. (2001) and those of Pawan et al. (2003), in both discussion types no units were found in Phase 4, which constituted vicarious application to real world, testing and defending solutions. When examining the percentages of cognitive presence (Phase 1, 2 and 3) in each type of discussion as shown in Table 4.1, it is found that in free discussion, Phase 2 (68.9%) has the highest percentage, comparing to Phase 1 (20.0%) and Phase 3 (11.1%). As for debate, Phase 2 (64.1%) similarly accounted for the most frequently occurred event. However, the difference between Phase 3 (19.2%) and Phase 1 (16.7%) seemed to be minimal. The results seemed to illustrate that the students did not perform different phases of cognitive presence in free discussion and debate. In both online discussion types, they primarily engaged themselves in expressing their own opinions or brainstorming new ideas to the issue discussed. They tended to spend less time in leading discussions in a new direction and integrating different ideas.

Research Question 3: Are EFL college students' interaction patterns related to their cognitive presence in online discussions?

To address the third research question, the descriptive statistics were employed for analysis, determining what types of interaction pattern may result in a certain phase of cognitive presence. Table 4.3 presents the percentages of cognitive presence in the two interaction patterns.

Table 4.3

Percentages of Cognitive Presence in Interaction Patterns

Phases of Cognitive Presence	Interaction Patterns	
	Independent Messages (n=53)	Interactive Messages (n=33)
Phase 1 Trigger	20.8%	21.2%
Phase 2 Exploration	69.8%	48.5%
Phase 3 Integration	9.4%	30.3%
Phase 4 Resolution	0.0%	0.0%

As shown in Table 4.3, independent messages occupy 69.8% of the units in Phase 2, while only 9.4% of the units is in Phase 3. As for interactive messages, 48.5% of the units occurred in Phase 2, and interestingly, a proportion of 30.3% was found in Phase 3. The results showed that the vast majority of independent messages centered on Phase 1 and Phase 2, with a low percentage in Phase 3. Regarding the interactive messages, a higher proportion of Phase 3 was observed. That is, it seemed to indicate that when the students posted independent message to address the postings initiated by the instructor or the mediators, they mainly narrated their personal experiences or unsupported arguments. However, when the students replied to others' comments (interactive messages), they tended to integrate previous opinions from other peers or incorporate other sources to address the issue discussed.

The analysis may thus reveal two emergent points: (1) independent messages characterized by one-way interaction tended to fall into Phase 1 and Phase 2, and (2) interactive messages featured by two-way interaction might trigger more discussions in Phase 3. To further illustrate the relationship between interaction patterns and phases of cognitive presence, the representative segments were provided.

1. **Independent messages characterized by one-way interaction tended to fall into Phase 1 and Phase 2**

As shown in Table 4.3, independent messages occupy 90.6% of the units in Phase 1 and Phase 2. This may imply that the participants' one-way monologue tended to present their recognition as well as their view of the problem with minimal connections to previous ideas and statements. The following Segments 4.1, 4.2, and 4.3 are a series of independent messages by different contributors on the discussion topic for *Truman show*:

Segment 4.1: Phase 1 (by S21)

Christof thinks that let Truman stay in Seahaven and protect him from worries is better for Truman. Sometimes parents make decision for children by their selves rather than refer to children's opinions, because they think their children did not know what is good and what is bad. Does anyone have any experience or comment about that?

Segment 4.2: Phase 2 (by S22)

For me, Christof is just like a devil that control Truman's life; furthermore, he even wanted to kill Truman as Truman wanted to sail for the other side of the Earth. So I do not think that Christof gave Truman a happy life but a terrible and bogus life.

Segment 4.3: Phase 1 (by S23)

I think that some people in the real world do not necessarily live happier than Truman before he was aware that he lives in a fake world. Does anyone agree with me? Maybe we can discuss about this.

After watching the movie, the members in Group C discussed if Truman was as a happier person in Seahaven than most people in the real world. In Segment 4.1, instead of commenting on other participants' statements, S1 as a mediator posted a

message in Phase 1 that took the discussion in a new direction. However, her question aroused little attention among the group members. In the subsequent segment, S22 replied to the prompt given by the instructor, presenting his ideas in the form of personal narratives without building on others' ideas. Simultaneously, S23 as another mediator began a new direction of discussion rather than justified others' opinions or referred to previous messages.

As these segments revealed, it seemed that the group members engaged in little interaction with one another. The discussion tended to center on Phase 1 and Phase 2, which were more concerned with puzzlement of the problem, information exchange, and brainstorming. Without interacting with other group members, it would be challenging for the participants to integrate messages from different sources and perspectives in Phase 3. In addition, it was observed that although the mediators were graded for their performance in leading discussions, they did not seem to actively participate in the forum discussions. Among all the 86 messages, they contributed only 16 postings during the three rounds of discussion. Additionally, 10 of the 16 postings were presented as a prompt that leaded the discussion in a new direction rather than integrate ideas shared in previous messages.

2. Interactive messages featured by two-way interaction might trigger more discussions at Phase 3

Table 4.3 indicates that 30.3% of interactive messages were identified as integration, while only 9.4% of independent messages were coded as integration. This may indicate that interactive messages with two-way or multiple interaction tended to foster more integrative messages which characterized convergence of different perspectives and reference to previous ideas. The following Segments 4.4 and 4.5 demonstrated how the discussion developed into Phase 3 through interaction among

the participants on the topic for *English learning*:

Segment 4.4: Phase 3 (by S25)

I think we have many resources to help us study English now in Taiwan, but I believe that there are still some problems. First, *like **S10** said*, we don't have strong motivation to learn English well in Taiwan than in an English speaking country. But I think if you cannot find much information in Chinese, then it might be a good motivation to learn English by searching English information. For example, I love jazz, there are really few jazz books or online resource was written in Chinese. And ***S1**'s online game* is also another example. I think the most difficult problem is we don't know the way native people speak English. Sometimes the grammar is correct, but they just don't use it that way.

Unlike the independent messages primarily dealing with personal narratives as shown in Segments 4.1, 4.2 and 4.3, the interactive segments were related to other postings by integrating previous ideas. In Segment 4.4, S25 apparently built his ideas on these two peers—S10 and S1. Prior to S25's contribution, S10 and S1 had presented their personal narratives about the potential problems of learning English in Taiwan. In S25's posting, he recognized the problems of learning English in a context-reduced environment and then provided reasons for the problems by referring to his group members. Additionally, he further attempted to justify the reasons by relating to his own experience and presenting possible solutions to the problems. In this way, he not only explicitly connected his posting to previous statements but also constructed meanings in an integrative way. These features constituted a typical discussion unit in Phase 3.

Segment 4. 5: Phase 3 (by S8)

"... if you cannot find much information in Chinese, then it might be a good motivation to learn English by searching English information. ..."

> That's right! I agree with you. Although I love to learn English, it is hard for me to learn it consistently, because I don't have a motivation which is strong enough to push myself to study hard. Having a powerful motivation of learning is more important than having a good teacher or a good textbook. As for me, I am so willing to read English information, articles, or reports which are related to my favorite writers, singers, and books. The hope of knowing them more is a good motivation.

The posting of S25 was replied by S8 in sequence, as illustrated above. The segment contained a quote from the previous message and addition to previous ideas. In the right beginning of S8's message, she explicitly presented her agreement by quoting one passage from S25, who provided a suggestion to enhance motivation of learning English. Aside from direct quotation, S8 connected her own experience to S25's idea of motivation for English learning, and further suggested that the pursuit of knowledge might motivate students to learn English as well. These statements suggested that new ideas were generated by integrating previous ideas, adding to the established point, or connecting to others' comments. They reflected various ways of creating a dialogue in which the participants communicated with one another, instead of a monologue in which they talked alone without audience.

In these segments, the integration that reflected the shared space in the discussion was interactive: the participant reached the integration phase based on other group members' exploration.

In the following chapter, the researcher discusses the major points of the findings and provides the limitations of the study, pedagogical implications, as well as suggestions for future research.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

In this chapter, several interesting issues revealed from the findings of the study were first discussed. Next, the limitations of the study were acknowledged. Finally, the major findings were summarized and followed by pedagogical implications and suggestions for future research.

Discussion

The findings of the study implied several interesting issues: the relationship between interaction patterns and discussion types, the relationship between cognitive presence and discussion types, and the relationship between interaction patterns and cognitive presence in two types of asynchronous online discussions (free discussion and debate).

Discussion types may lead to different interaction patterns

The descriptive statistics indicated that the proportions of independent and interactive messages in free discussion and debate were not equally distributed. A higher percentage of independent messages at one-way interaction were identified in free discussion. In contrast, a wider proportion of interactive messages at two-way direction were found in debate. The results showed that in debate the participants tended to engage themselves in prior contributions generated from a chain of interaction.

Independent messages dealing with the topic without answering and commenting other participants' statements may leave discussions at one-way interaction. This pattern of interaction dominated in free discussion, where the participants generated

diverse directions of discussion with little interpersonal relations among other group members. In free discussion, one group member proposed discussion questions, while others remained isolated without responses. The results appeared to be in line with previous studies (Fahy, Crawford, & Ally, 2001; Gunawardena, Lowe, & Anderson, 1997), in which independent and personal statements were more likely to dominate online free postings. In such a loosely connected network where individuals presented their opinions without interaction, mutual assistance in learning would be rare (Zhu, 2006).

Interactive messages, referring to previous messages contributed by other participants, may foster thinking development. This type of interaction pattern was mostly revealed in debate, where the participants interacted with two or more other group members. The arguments fostered interaction throughout the debate (Gunawardena, Lowe, & Anderson, 1997), encouraging the participants to challenge cognitive dissonance and conflicts among ideas. Accordingly, interaction within debate provided the learners with the opportunity for verifying and validating information. Thus, it facilitated group decision-making process (Henri, 1991). Zhu's (2006) study also suggested that two-way interaction with interconnected networks such as online debating promotes knowledge construction among group members.

The finding suggested that online free discussions may trigger little interaction while online debate may foster two-way interaction among the participants. It may be contrary to the inferences drawn from previous studies that online environments promoted interaction among students (Warschauer, 1996; Payne & Whitney, 2002). In the study, interaction did not occur naturally simply due to the online environment created. In the online context for free discussion, for example, the participants still engaged in little interpersonal interaction with other members. This seemed to imply that the instructional design—two types of online discussion, rather than online

environments, affected interaction among the participants. It might be the planning of learning activities that influenced interaction in an online discussion (Zhu, 2006).

Multiple factors may affect cognitive presence

Similar to the findings of Garrison et al. (2001) and those of Pawan et al. (2003), no units were found in Phase 4 Resolution, which constitutes vicarious application to real world, testing and defending solutions. The virtual absence of responses associated with resolution may be attributed to the nature of computer conferencing. In face-to-face mode, it usually requires a great deal of planning and efforts to test solutions and apply solutions to the real world. However, according to Garrison et al. (2001), this test and application could be even more challenging in the asynchronous text-based environment without nonverbal cues and turn-taking rules.

The results indicated no difference in the phases of cognitive presence between the two types of online discussion. The participants produced similar percentages of Phase 1 , 2 and 3 in free discussion and in debate. The similar phases of cognitive presence in both discussion types might be due to the instructional factors. In the study, the researcher designed different guiding questions for free discussion and debate. However, before each round of discussion, no training sessions were arranged to help the participants be familiar with the formats of online free discussion and online debate. Thus, the students might have vague ideas about how to participate in the two types of discussion even though they were provided with one guideline for free discussion and debate. Consequently, they might not know how to provide reasonable argument for and against a given proposition in engagement of online debate. This result corresponds with recommendations provided by Johnson and Johnson (1996) that the instructors need to adapt the learners to online discussion design such as discussion tool or discussion task.

Additionally, the results seemed to suggest that cognitive presence in online discussions might be related to the participants' participation frequencies in the online discussion. Although participation in online discussion accounted for 20% of the course grade, ten out of the 30 participants had ever remained silent in either one round of online discussions. In addition, 17 participants did not contribute any further message after their initial posting. Those silent participants were recognized as "lurkers," and their inactive participation may make it difficult to understand their cognitive engagement in online discussions (Zhu, 2006). The reasons for lurking and inactive participation that occurred during online discussions remained unknown.

Effective leading of discussion (i.e. teacher involvement and mediators) may play a vital role in the learners' cognitive engagement in online discussions. To create a less authoritative environment, the instructor rarely participated in the discussions. During the three rounds of discussion, she contributed 6 postings as the initial prompts and let the mediators take the responsibility for leading the online discussions. According to Gredler (1997) and Nike and Lara (2006), it might be difficult for the learners to achieve higher level of cognitive engagement without guidance from a mentor. In a limited instructor-leading task, discussions might not easily move into higher phases of cognitive presence. Although, the mediators were assumed to take active roles to lead the online discussions, they seldom commented on other members' responses or attempted to evoke discussions. Instead, they tended to post a prompt that leaded the discussion in a new direction rather than promote interaction among the group members.

Interaction patterns may be related to cognitive presence

The study results seem to suggest that a specific type of interaction patterns may relate to the phases of cognitive presence. Independent messages, characterized by

one-way interaction, tended to fall into Phase 1 and Phase 2, and interactive messages featured by two-way interaction may trigger more discussions in Phase 3.

The segments demonstrate that the pattern of one-way interaction promoted discussion in terms of quantity with the learners productively posting their responses in Phase 1 and 2. The observation corresponds with Henri's (1992) study in that the independent messages identified in teleconferences are primarily indications of puzzlement and personal comments. However, one-way interaction does not seem to promote the desired quality of cognitive presence (Garrison et al., 2001), which is achieved through collaborative interaction among group members. As shown in the study, in the three rounds of the online discussion, the participants mainly reflected their personal experiences directly relating to the initial prompts rather than created shared meanings perceived by group members.

As referred from the study, the lower phases of cognitive engagement might be resulted from one-way interaction. The results resemble the findings from previous studies (Gunawardena et al., 1997; Pawan et al., 2003). In one-way serial monologues characterizing few connections among peers and postings, participants have great difficulty moving beyond the Exploration phase (Garrison & Arbaugh, 2007). That is, while the participants are primarily devoted to one-way interaction, they may not be capable of moving from Exploration to Integration and Resolution which require collaborative construction of knowledge (Pawan et al., 2003).

With respect to the interactive segments characterizing two-way or multiple interaction, it seems that interactive messages may promote integration which focuses on connection of ideas and integration of various perspectives via peer communication. The results are consistent with the findings of Schellens and Valcke's (2004) study in which interactive participation generated from small discussion groups reflects higher phases of cognitive engagement. As indicated by Garrison et al.

(2001), Phase 3—Integration—arising from ideas generated in the previous phase must be inferred from group interaction. Through interaction, participants are able to incorporate various personal perspectives and link different concepts (Zhu, 2006). Thus, they may promote personal narration to shared understanding within the online community of inquiry.

The results are also in agreement with previous research indicating that interactive participation among the group members facilitates higher cognitive engagement (Bonk & King, 1998; Gokhale, 1995; Kanuka & Garrison, 2004). In peer-to-peer collaborative interaction, dissonance in a discussion can be actively explored, and new understanding of an issue may be created in higher phases of cognitive presence (Kanuka & Garrison, 2004). In the interactive messages where the participants interact with others, they may achieve better understanding of knowledge or solve problems that they are not able to achieve alone.

Limitations of the Study

There are several limitations to this study. First, training sessions about how to participate in of the two types of online discussion (free discussion and debate) should be provided. If the participants were familiar with the formats, for instance, they might know better how to provide reasonable argument for and against a given proposition in engagement of online debate. Second, the study lacked qualitative data such as interviews and questionnaire after online discussion to clarify the reasons for lurking and inactive participation that occurred during online discussions. Third, the data were collected from a small sample size of participants mostly from science and technology-based fields. Thus, the results and the implication should be viewed with caution.

Conclusion

The major issues emerging from the findings are summarized and followed by pedagogical implications as well as suggestions for future research.

The present study attempted to investigate EFL undergraduate students' interaction patterns and cognitive presence in two types of online discussion— free discussion and debate via an asynchronous discussion forum. The relationship between interaction patterns and cognitive presence was further explored. Through investigation of online discourse, it was found that interaction patterns in both discussion types seemed to display different patterns. Additionally, the results seemed to indicate that the students did not tend to perform different phases of cognitive presence in free discussion and debate. Finally, independent message and interactive messages may lead to different phases of cognitive presence.

With regard to the effect of online discussion types on message types, the descriptive statistics indicated that the percentages of independent and interactive messages in free discussion and debate seemed to be different. In free discussion, the asynchronous discussions primarily centered on independent messages at one-way interaction; in debate, the responses accounted for equal proportions of independent and interactive messages, constituting more complex network of interaction at two-way or multiple direction.

As for the effect of online discussion types on cognitive presence, the results appeared to indicate that the students did not perform different phases of cognitive presence in the two types of online discussions. The results might be due to the lack of training sessions that familiarized the participants with the formats of online free discussion and online debate. Additionally, the participants' lurking behaviors and inactive participation might relate to their cognitive engagement. Other factors may include the lack of teacher involvement and active engagement of the mediators in

online discussions.

Finally, independent message and interactive messages may lead to different phases of cognitive presence. Most independent messages characterized by one-way interaction tended to constitute students' recognition as well as their view of the problem with minimal connections to previous ideas and statements; interactive messages featured by two-way interaction may trigger the students to integrate various ideas from their peers.

Pedagogical Implications

Several pedagogical implications could be drawn from the results of the study. First, as instructors who attempt to integrate different discussion formats via online communication, we should arrange training sessions of the formats before the discussions are actually held. Thus, the training sessions may help students be familiar with the online discussion activities. In training sessions, for instance, the instructor may encourage students to demonstrate their debating skills such as explicit presentation of ideas and argument development. At the same time, the instructor may offer concrete guidance (i.e. elaborating concepts, negotiating meanings) to assist students in conducting online debate. Thus, students may be aware of the differences between online free discussion and online debate, and further know how to perform expected behaviors in the two types of discussion.

Second, instructors should be cautious about the implementation of learning activities that engage students in an online discussion. Based upon the study results, the instructional design—two types of online discussion, rather than online environments, seemed to affect interaction among the participants. To design an effective online activity, instructors may connect the activity with course objectives and learning goals that facilitate interaction. If the course objective is to encourage

students to write for free interaction and communication, online free discussion may be adopted. If the course goal is to foster multiple interaction among students, online debating sessions might be implemented. It would be the careful planning of learning activities that affected student interaction in an online discussion.

The third implication emerging from the study is that instructors should be aware of the factors that may influence cognitive engagement in an online discussion. As above mentioned, factors including student participation, teacher involvement, and the role of mediator may cause considerable effect on students' cognitive presence during these two types of online discussion. Given the multiple factors, it would be imperative for instructors to take these facilitating factors in an online discussion activity into account. In this way, online discussion may be beneficial to foster student interaction and the development of their critical thinking.

Suggestions for Future Research

The study investigated interaction patterns as well as cognitive presence in two types of online discussion, providing insights into the ways of student interaction and cognitive engagement via an asynchronous forum. In the present study, the researcher only included a small sample size of participants mostly from science and technology-based fields. To confirm the results in the study, future studies may recruit a larger sample size of students from various academic backgrounds. Additionally, the researcher only collected the students' online transcript to examine interaction patterns and cognitive presence in the study. Future research may include qualitative data, such as interviews and questionnaire, to enrich our understanding of students' lurking and inactive participation that occurred during online discussions. Third, in addition to online free discussion and online debate, future studies may incorporate more discussion types to examine their effects on interaction patterns as well as

cognitive presence. For example, problem-solving activity may be employed to examine students' interaction patterns and promote their thinking development in the fourth stage in which they are encouraged to create and test solutions to real world.

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APPENDICES

Appendix A
Consent Form

同學你好!

本人為語言中心專任助理教授張靜芬,與英語教學所許祐熏同學及王信雲同學將進行針對大學生「在以電腦中介溝通所呈現之批判性思考以及在不同溝通模式下進行之同儕互評活動對於英文寫作學習的影響」研究計畫。本計畫主要以問卷和訪談方式進行,並收集你在這堂課進行之寫作、網路討論記錄、以及同儕互評的對話及討論記錄等資料。因此,如果你應允參加本計畫,在這一學期中**你將需回答一次的問卷**(questionnaire)**及二次的訪談** (interviews) (均在下課時間進行,不影響你的上課權益)。**你的參與與否絕對不會影響到你修習這門課程 —「網路英語寫作」的成績及權益**。

若你決定參加本計畫,你所有訪談及問卷資料將會進行保密,除了本人及參與計畫之研究生外,絕對不會有第三者知悉。如果你在參與的過程中,感覺不愉快或無意願繼續參與,可隨時提出中止。但你的熱情參與,將幫助我們了解大學部學生如何在電腦中介溝通中進行批判性思考以及與同儕互評對你的英文寫作之影響,因此,在此懇請你支持,並且為答謝你的參與,在期末你將收到一份精美的小禮物。

若你決定參與本計畫,請在下方簽名處簽上你的全名,之後將影印一份交由你個人保存。若你在參與過程中有任何疑問或建議,你可隨時和我(cfchang@mail.nctu.edu.tw)、 許同學(u891211@hotmail.com)、或王同學(jillisunique0615@hotmail.com)聯繫。在此先感謝你的參與。

參與者姓名_____(正楷)_____(簽名)日期 _____

張靜芬 _____ 日期 _____

許祐熏 _____ 日期 _____

王信雲 _____ 日期 _____

Appendix B

Background Questionnaire

姓名:_____ 性別：男□ 女□

同學你好!

這份問卷是用來瞭解你在電腦使用、英文學習經驗此二方面的實際情形。**問卷結果僅供研究參考，絕不私自對外公佈，且將不會影響到你修習「網路英語寫作」的成績及權益。**

請同學依據自己實際的學習經驗，在適當的□打∨。謝謝您的參與和合作!（共5題）

第一部份:電腦使用經驗

1. 我是否曾利用網路聊天室聊天?

經常□ 有時□ 偶爾□ 很少□ 不曾□

2. 我是否曾利用網路回文章（如：BBS、論壇等）?

經常□ 有時□ 偶爾□ 很少□ 不曾□

3. 我是否參加過以網路討論方式進行的課程？是□ 否□ (*回答「否」的同學，下題不必作答)

以何種語言討論？中文□ 英文□ 其他□（語言種類：_____）

第二部份：英文學習經驗

4. 我是否曾參加過以下語言檢定考試？

全民英檢□（初級□ 中級□ 中高級□ 高級□ 優級□）

TOEFL□（《請註明 PBT/CBT/IBT 》分數：_____）

其他□（請註明《考試名稱》與《分數》:_____）皆無□

5. 我覺得自己的英文程度大概是在？(*請將對應英文程度的數字圈起來。)

【 1:很不好→ 2:不好 → 3:普通 → 4:好 → 5:很好 】

『聽』:	1	2	3	4	5
『說』:	1	2	3	4	5
『讀』:	1	2	3	4	5
『寫』:	1	2	3	4	5

Appendix C
Predetermined Types of Discussion, Topics and Guidelines

	Week 4-5: English Learning	Week 7-8: Movie (Truman show)	Week 12-13:Career and Dream
Free discussion	Group A	Group C	Group B
	As you know, most students have had rich English learning experience. Most of you learn English in Taiwan whereas few of you have had the chance to learn English in an English speaking country (like USA, Britain, Australia, or New Zealand). As an English learner, do you think that it is necessary to learn English well in English countries? Why or why not? Please post any thoughts about this topic.	Christof, as the program's producer, has intended to play the role as Truman's father. He protects Truman from worries, arranging everything in Truman's life: his career, his friends, and even his marriage. Do you think Christof makes Truman a happier person in Seahaven than most people in the real world? Why or why not? Please post any thoughts about this topic.	One piece of recent news reports that a 28-year-old engineer chooses to work on the farm as his dream, quitting his one-million annual income in the science park. Do you think it's a good decision? Why or why not? Please post any thoughts about this topic.
Debate	Group B	Group A	Group C
	As you know, most of us have had rich English learning experience. Some of us learn English only in Taiwan but some of us have had the chance to learn English in an English speaking country (like USA, Britain, Australia, and New Zealand). Do you agree that to study abroad is the best way to learn English well? Try to provide pro and con	Christof, as the program's producer, has intended to play the role as Truman's father. He protects Truman from worries, arranging everything in Truman's life: his career, his friends, and even his marriage. Some people think it's happier for Truman to live in Seahaven (pro), while other people think it's happier for Truman to live in the real world (con). Which position do you take? Try to provide	One piece of recent news reports that a 28-year-old engineer chooses to work on the farm as his dream, quitting his one-million annual income in the science park. Some people think he should choose career as the priority (pro), while other people think he should choose dream (con) as the priority. Which position do you take? Try to provide pro and con opinions and defend

	opinions and defend your opinions. I hope that you can regard this space as a place to debate this issue.	pro and con opinions and defend your opinions. I hope that you can regard this space as a place to debate this issue.	your opinions. I hope that you can regard this space as a place to debate this issue.