# EXPLORING STUDENT AND TEACHER INTERACTIONS FOR CRITICAL THINKING IN FACE-TO-FACE AND ONLINE ENVIRONMENTS IN AN EFL COURSE IN TAIWAN

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# ABSTRACT

Current literature indicates a lack of exploration of factors relating to Taiwanese students' critical thinking in the field of English as a Foreign Language (EFL). The research study was a case study based on the social constructivist framework. The aim of this study was to explore how teacher and students interactions online impacted critical thinking by addressing the social norm in Confucius Heritage Culture (CHC). The characteristics of the social norm of CHC do not readily support verbalizing thoughts and challenging others face-to-face in public, which are important to the practice of critical thinking. The research was conducted in an English-major reading class at a university in Taiwan. The data collection methods included focus groups, collaborative inquiry with the teacher, and the researcher's participant observation in both face-to-face and online discussions.

The findings suggested that students need teacher's cognitive, affective, pedagogical and technical support and face-to-face small group support before engaging in online interactions. Modified debates in new face-to-face models of interaction helped maximise the social constructivist approach with the teacher's shepherd facilitation. The online interaction patterns in a CHC context underwent a three-phase process, which described how CHC students externalised critical thinking within groups, inter-groups and inter-classes in online form. The study contributes to our understanding and the development of culturally suitable approaches to cognitive, affective, pedagogical and technical guidelines needed in facilitating EFL students' critical thinking in face-to-face and online interactions in the context of Taiwan.

# DECLARATION

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma. No other person's work has been used without due acknowledgment in the main text of the thesis. This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution. All research procedures reported in the thesis received the approval of the relevant Ethics committee. Approval number: V2003.04-08.

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# CHAPTER 1

# INTRODUCTION

*Five colours in sight make one blind; five tones of sound makes one deaf…When hunting for sport, and chasing for pleasure, the mind easily becomes perplexed. (Laots, B.C. 604).*

The statement above by Chinese philosopher, Laots, sets the context for this study. It illustrates the need for appropriate pedagogical guidelines for critical thinking in the application of cyberworld principles and practices to the world of education. As technology and telecommunications have developed in the global context, Internet communication has become an integral part of the human experience across fields. Internet communication is a significant means of communication, especially among the youth of today. According to *Youth Daily*, (Liang, 2002), the Internet has become the major source of information for college students in Taiwan. However, as youths use the Internet primarily for entertaining and socializing (Liang, 2002), this thesis argues the need for maximising the use of the Internet as an educational mindtool (Jonassen & Carr, 2000, Jonassen, 2001, 2002, 2003) particularly in human relationships to establish supportive learning environment. In the framework of Taiwanese education, these qualities might adopt in the context of using online discussion to develop student's verbalisation of critical thinking in both face-to-face and online learning environments.

Critical thinking is a cognitive skill needed by English as a Foreign Language (EFL) students (Brady & Shinohara, 2003). While much of the information from around the globe is mediated in English online and thus has a concentration of limited cultural expressions (Magder, 2004; Ritzer, 2004; WTO, 2000), it is important to cultivate EFL students' critical thinking in order to allow them to verify the degree of credibility and validity from the sea of global information embedded with foreign values and assumptions.

Taiwanese rational educators, that is those who stress rational thought for education from a scientific perspective (Lee, 2002; Wu & Lee, 2002; Wuei, 1999), acknowledge critical thinking as a cognitive ability needed by EFL students in order to fully participate in dialogues and especially in the online environment of the internet.

Whilst the need for critical thinking is recognised, some western educators (Jeong, 2004; Kneser, Pilkington, & Treasure-Jones, 2001; Pilkington, 2001; Walker, 2002; Walker, 2004) have undertaken research into structures and strategies which will allow teachers and learners to blend the social practices of respect for different views with the verbalisation of opposing or alternate views generated by critical thinking. However, there is little evidence of research about online learning environments for EFL students, particularly in the verbalization process of critical thinking in EFL learning.

Coupled with the factor of culture facilitating critical thinking is a challenge in the cultural-bound context of Confucius Heritage Culture (CHC), which dominates Taiwanese education. Although openly discussing an issue and expressing different viewpoints is a social norm in some cultures, it is not assumed in CHC. Rather, the priority in CHC is social harmony and silence for students in Taiwan, compared to their counterparts who have experienced the century-long British influence in Hong Kong or the Marxist critical impact in communist China (Yeh & Chen, 2004). Verbalising critical thinking is not culturally encouraged for students in Taiwan and is a traditional cultural boundary.

In realising the global communications potential of the Internet for EFL students, it would seem important to investigate how to maximize the affordances of the Internet by exploring different models and pedagogy which might assist in generating socially constructed environments for critical thinking (Jonassen, 2000, 2001, 2002, 2003). The medium of the Internet allows knowledge buildup through hypertext and flexible linking and open discussions without the need for face-to-face encounters (Chen & Lin, 2002; O'Dowd, 2003; Sveningsson, 2004) as the nuances of body language and eye contact do not influence students' true verbal expressions. The purpose of this research was to

explore how to foster EFL college students' expressions of critical thinking in online interactions within the context of Taiwanese education.

## Background to the Study

The following is a brief summary of how the research idea for this thesis evolved. The idea originated from my master's study in Communications when I was a technical facilitator of Internet-supported one-way video, two-way audio distance education classes in the USA in 1996. My experience in video-conferencing via satellite and live televised broadcasting with call-in access via cable prompted me to consider the question of how to modify western communication models and advanced technology for the Chinese educational context in Taiwan.

A number of brief explorations have guided my journey since 1999 to 2003. Over four years I used four different forms of software. This journey began in 1999 when I used newsgroups for sophomores to discuss issues emergent in relation to different media. Students reported in interviews that they were satisfied with the online interactions, yet the overload of weekly e-mail messages turned me towards investigating other approaches of using software in class. In 2000, ninety university freshmen in my two classes posted their weekly news summary in a web-based homework system, yet this mechanism of interaction was frequently not used. In 2001, Wenzao, the college in which I worked, adopted the E-course system, an all-encompassing web course environment similar to the Web-CT system with content, asynchronous and synchronous interaction modes, homework and grading sections. One of my two classes chose not to participate in this E-course, instead, preferring to use face-to-face small group discussions due to the immediate response and affective support available for their weekly journals. In the year-end questionnaires, this class demonstrated higher motivation in English news reading and writing than the online class. The online class, however, demonstrated a higher improvement rate in English reading comprehension. The difference between the two was surprising, even though the methods and motivation differed. The surprising result urged

me to rethink how online learning helped EFL students and whether it was fair for only one class to experience online reading and discussion. In 2002, both of my Journalism classes had one lab hour each week for an online discussion on issues selected by students. The online participation rate was high: three-quarters of the class browsed and posted their opinions online weekly, but appeared not to reflect in in-depth critical thinking, due to the nature of in-class online interactions. In view of the lack of thorough critical thinking processing, the current research study focused on how to maximize critical thinking and its verbalisation in the combined face-to-face and online interactive environments by exploring culturally and pedagogically suitable models for EFL students in Taiwan. The following section introduces critical thinking in the context of Taiwan.

## 1.2 Critical Thinking in the Taiwanese Context

### *1.2.1. Chinese Critical Thinking*

Critical thinking is a cognitive skill required by EFL students (Brady & Shinohara, 2003) as they encounter the English culture and values of online information in the globalized context. EFL teachers carry a two-fold mission: to safeguard the local cultural heritage and to foster students' ability to communicate and compete in the global world (Korsgaard, 1997). While critical thinking in the West has long been based on cognitive perspectives, such as those referred to from earlier times in Bloom's taxonomy (Bloom, Krathwohl, & Masia, 1956), Bloom's lesser known work indicates correspondence of the cognitive ends with an affective dimension (Krathwohl, Bloom, & Masia, 1964). In a recent revision of the seminal work by Bloom's partner Krathwohl and others (Anderson, et al., 2001), "evaluation" replaces "synthesis" as the top objective, and synthesis is equated with "creating". It can be suggested that this may imply critical thinking skills are interrelated with the affective dimension. Other researchers also express the correlation between the cognitive and affective domains in examples such as open-mindedness to challenge deep-rooted assumptions, attitudes and beliefs (Picciotto, 2004); critical attitude (Argyis, 1982); flexibility in exploring alternatives (Ennis, 1985); and social-centric sensitivity affective strategies (Paul, Binker., Jensen, & Kreklau, 1990). As critical thinking does not occur in

a vacuum, cultural factors also play an important role in critical thinking in ways of processing thinking (Brookfield, 1987; Thompson, 2002), cognitive development stages (Piaget, 1950) and historical, social and cultural "context" in the thinking process (Nosich, 2001).

Verbalising critical thinking however, is not a social-cultural norm of the Chinese culture. Chinese thinkers do not undervalue critical thinking, but the Chinese terminology of critical thinking does not assume a verbalising element of criticism. As a result, what is commonly considered as criticism in western culture is commonly referred to as "reflection" or "logical reasoning" by contemporary academics (Lee, 2002; Wu & Lee, 2002) in the Chinese culture. This thinking skill is also urged by other Taiwanese scholars in non-EFL fields from nursing to science studies (Cheng & Yeh, 2000; Lee, 2002; Yeh & Chen, 2004; Yeh, 2001).

The education master and great Chinese thinker Confucius (B.C. 551-479) defined the notion of critical thinking in analytics: "Learning without reflection is a waste, while reflecting without learning is dangerous" (Confucius). The word Confucius chose "reflection" (思) denotes the component of a critical mental process, yet the phrase "critical thinking" (批判思考) is rarely used in Chinese for the negative implication of "criticism" (批判), with its second character being the same phonetic symbol as "rebellion". The social cultural norms embedded in Confucius and Taoist mentalities thus form a different teacher-student interaction and pedagogy in Chinese classrooms. A more detailed introduction of critical thinking will be illustrated in chapter 2.

### *1.2.2. Confucius Heritage Culture*

Before exploring the issue of critical thinking in the context of Taiwanese education, there is a need to firstly understand the uniqueness of CHC in the Taiwanese context as distinct

perhaps from its influences in other blended Chinese–Western societies such as Hong Kong.

Historically, Hong Kong had been a British colony for over a century until it was returned to Taiwan's rival, communist China in 1997. English was the official language and the language for lecturing in most colleges. The influence of the English culture of openly expressing opinions in Hong Kong was shown in 500,000 Hong Kong residents in 2003 and 250,000 in 2005 protesting to China according to the *Guardian*. British influence and education, transmitted in English, mark the difference between Hong Kong students and Taiwanese students. For Taiwanese students, English is a foreign language (EFL). In contrast to their Hong Kong counterparts, for Taiwanese students, English is not commonly used or spoken in society outside the classroom.

Before moving to the pedagogical implications in CHC classrooms, the following sections will explain the salient social learning characteristics of the Chinese culture: the less verbal and social harmony in interrelationships, and teacher authority.

*Less Verbal & Social Harmony*. Chinese speakers grow up to be generally less verbal in public (Chang, 2001; Sun, 2003). There are cultural, political, and religious reasons that contribute to the social and cultural norms of not verbalising critical thinking. First of all, modesty and silence in public are virtues, as validation comes from its ontological being, not verbal argumentation. Hence, it is traditionally more acceptable to use non-confrontational conflict management (Chang, 2000; Sun, 2003; Wang, 1954). With the political influence of a feudal system lasting five thousand years and Han Dynasty Emperor Wu (B.C.156-87) promoting Confucian schools, traditionally Chinese exercise the tendency of silence in the civil sphere (Wan, 2004). Religiously, the Buddhist fatalism of suffering in this life as the penalty of previous life reinforces the Chinese silent forbearing (Wuei, 1999). Chuang (2004) also explains this as embracing conflicts by "silence" rather than confronting adversities. All factors above lead a cultural norm of silence and the generally less verbal interaction patterns that Sun (2003) describes.

Western researchers have attempted to examine the social and collectivist characteristics of Confucian Heritage Culture (CHC) in students, primarily in the international harbor, Hong Kong (Biggs, 1996; Bond, 1996; Watkins & Biggs, 2001). Local educators in Hong Kong (Ho, 2001; Wong, 1998) also found that characteristics of learning in the CHC include achievement orientation, diligence, and the social origin of interactions. These characteristics are also found in Taiwanese students. However, Ho (2001) and Wong (1998) did not detail whether Hong Kong students followed the western norms in verbalizing critical thinking. According to Chan's (1999) comparison study of Australian and Hong Kong college students, Hong Kong students were found to seldom express their disagreements explicitly to their teachers, though they did not just accept all the information given to them. This characteristics are valid to Taiwanese students.

*CHC Teacher Authority.* With regards to teacher-student relationships, Chang (2001) found that in the CHC cultural norms, students are less verbal in order to show reverence and submission to teachers who are the symbols of knowledgeable authority. Watkins and Biggs (2001) note that the social orientation in CHC cultivates a special emphasis on teacher authority. The role of the teacher is more than simply being a lecturer, it also equates with the moral role as a "parent" (Watkins & Biggs, 2001). The holistic view of knowledge transmission integrates affective and moral well-being in the cognitive processing with a "collectivist obligation to behave within the socially accepted ways" (Watkins & Biggs, 2001, p. 282). As Confucius placed teachers among the five pivotal relationships with Heaven, Earth, Kings and parents in *Analytics,* the teacher-student relationship is thus demonstrated in a common Chinese proverb, "One day teacher, lifelong father". Good teaching practice does not necessarily involve a particular approach, but enhances learning using culturally appropriate methods. The combination of a less verbal norm and, social harmony, along with submissiveness to authority leads to the CHC non-confrontation style of communication.

Ho (2001) stresses that Chinese teachers are not authoritative, but simply reserve their humor, personality, and affective relationships outside classroom. While Ho's (2001) work

was based in Hong Kong, evidence of studies of the characteristics of Taiwanese teachers has not been located in the confines of this study.

In summary, recognising the long journey of the CHC cultural background, now let us move to the pedagogical implications from the cultural norm that does not verbalise critical thinking.

### *1.2.3 Pedagogical Implications of CHC in the Classroom: Sensitivity to cultural norms*

The implication of this cultural background inherent in the traditional CHC practice is the need for pedagogical emancipation for CHC students to be empowered to express their opinions and exercise critical thinking, without the fear of the authority or of violating social norms. Chinese scholar Chang (2000) argues that Chinese are being portrayed as deviant from western norms and constructs in recent cross-cultural studies of Chinese identity, which need to be contextualised into the classroom.

An interesting comparative study of North American aboriginal speakers and English speakers by Scollon & Wong-Scollon (1990) found contrasting communicative styles in distinct cultures that may provide insights into sensitivity of different culture norms. Some of the comments from the English speakers about Athabaskan speakers' styles included

> They do not speak.
> They only want to talk to close acquaintances.
> They never start a conversation.
> They are slow to take a turn in talking.
> They avoid direct questions.
> They ask questions in unusual places. (p. 284)

On the other hand, Scollon & Wong-Scollon (1990) found that some Athabaskan speakers described the English speakers as,

> They always talk first.
> They talk too much.
> They ask too many questions.
> They always interrupt.
> They only talk about what they are interested in.
> They don't give others a chance to talk. (p. 284)

In considering different cultural communication patterns, researchers need to attend to specific communication patterns and be aware of possible conflict points and confusion in communication processes. Modification thus may be necessary in a cultural context.

*Modification needed for the Taiwan context: Immersing*. Taiwanese science educators Wu and Lee (2002) call for modification of the Western rational education model to the Taiwan context due to cultural, social, historical and educational differences. Modification needs to examine in depth the possible interactions among those factors and the impact of these deep roots on individual cognitive development. Meanwhile, Yang (2000) has found that with the globalisation drive to globalise universities, local scholars are forced to adopt research constructs familiar to the western mainstream international journals, implying the difficulty in sustaining CHC teaching and learning while balancing the global forces to homogenise the world. To remedy the fragmented adoption of the western framework, nursing educators Cheng and Yeh (2000) thus urge the need to include gradual immersion and infusion by teaching of reflective thinking, delaying judgment for sufficient reasoning and seeking alternatives across curricula. Teachers' demonstration of their own thinking may be important in immersing students in critical thinking and encouraging students verbalising of their critical thinking in the teaching and learning process.

*Informal affective relationship with students.* The CHC cultural norm leaves teacher-student affective relationships to informal settings after class (Ho, 2001). The affective and personal relationships are thus established through informal interactions outside the formal classroom. Unlike their western counterparts, teachers in a CHC context need to reserve self-exposure, their personalities, humor, and values in class. What this researcher argues is that teachers can nurture this affective relationship first in informal setting after face-to-

face class sessions, then transport it into an online environment, which in turn impacts on the teacher-student relationship in the face-to-face learning environment. Mok et al. (2001) urge a deeper understanding of Chinese students' learning patterns to scaffold classes in orchestrating a choreography for active engagement in the learning process. In view of this, teachers in a CHC context need to create socially constructed experiences to address students' cultural, cognitive, and affective needs in suitable pedagogical models and learning environments.

## 1.3 Socially Constructing Critical Thinking

This part will briefly address the issue of social construction of critical thinking which will be further developed in chapter 2. Since critical thinking is not part of a typical Chinese culture, yet is particularly needed in information literacy (Lee, 2002; Wu & Lee, 2002), it is crucial to optimise the internet capability for interactive learning in order to assist in developing students' critical thinking. How to maximise instructional interactions for critical thinking is an issue worthy of investigation.

According to Vygotsky (1960, 1978, 1989) and social constructivist theory, higher order thinking is best mediated through social interaction. Language-mediated interactions stimulate thinking by transferring inter-personal social interactions into intra-personal mental processing. Critical thinking does not occur in a vacuum, but develops from interacting with others' minds and thoughts in dialogical engagement before formulating ones' own thinking. With the CHC mentality of less verbal communication and a more socially harmonious norm, this research chose social constructivist theory as the theoretical framework to explore critical thinking construction through teacher and students' language-mediated social interactions in exchanging meanings (Jennings & Di, 2001). Seeking a proper tool to implement a social constructivist learning approach is thus important in the rationale of this research study exploring the enhancement of CHC students' verbalisation of critical thinking.

Online discussion is a powerful mindtool to foster critical thinking (Astleitner, 2002; Frank & Davie, 2001; Jonassen, 2001; Larson & Keiper, 2002; Zembylas, Vrasidas, & McIsaac, 2002). It is argued that online discussion is an effective tool for a social constructivist approach to encourage EFL/ESL (English as a Second Language) students' verbalisation by removing apprehension in communicating face-to-face due to cultural factors (Kung, 2003a; Merryfield, 2003). Nevertheless, online teachers need skillful facilitation or moderation skills, knowledge and understanding. Without online moderation/facilitation by the tutor, Salmon (2002, 2003), and Chiu (2002) found limited student-student online interactions due to the separation of teacher and students in the physical environment. This position is supported by Taiwanese tertiary educators' (Chu, Li, Lin, & Lee, 2002) who call for gentle transition with face-to-face discussions to help students overcome unfamiliarity of transiting mental processing individually, which Hsieh (2000) observes as a difficulty for verbalising thoughts in online text-format by typing complex Chinese characters.

With regard to the online modes of interaction, EFL/ESL educators Kung (2003) and Sotillo (2000) found that synchronous conferencing generated more interaction, while Bullen (2001, 2003) and Merryfield (2003) ascertained the asynchronous mode more effective for critical thinking development. Taiwanese educators Chen and Lin (2002) with Yang and Chang (2003) stress the need to include face-to-face interactions in the online models to supplement students' interactions. Therefore, one of the research focuses was to explore what online modes of interaction and face-to-face models of interaction may better foster critical thinking for EFL Taiwanese college students.

## 1.4 Research Questions

In view of the CHC background and less verbal communication patterns, how teachers facilitate students' interactions to address cultural and affective factors is a critical issue that may yield culturally appropriate pedagogical patterns for the cognitive transformation for Taiwanese EFL students. The research question of the study was formulated as:

1) How do student and teacher interactions impact critical thinking in face-to-face and online environments in an EFL course in Taiwan?

This question was operationalised by the following:

a) How does a teacher facilitate EFL students' online interaction for critical thinking in news discussions in Taiwan?
b) How do different modes of interactions impact on students and teacher online interaction and critical thinking?

## 1.5 Limitations of the Research

The results of this research should not be generalized to all other EFL classes due to the following limitations of the study. First, the study was carried out in Taiwan where English is a foreign language and verbalizing in English is not as common as some societies also under CHC influence. Second, this study investigated a particular class at the only foreign college in Taiwan and the language environment might not be applicable to other EFL students. Third, the teacher of the class was not a Taiwanese EFL teacher, but a professor from Hong Kong who taught political science in English there prior to coming to Taiwan. Fourth, the local technology development in Taiwan is mature enough that most students have Internet access either at college or home. Next, the teacher did not have previous online teaching experience, thus the researcher needed to be the online facilitator in supporting students' online interactions. Also, all the online discussion topics were derived from the teacher's existing curriculum. They were not tailored specifically to accommodate students' interests in this class. Finally, as this research study was voluntary, students' online participation rate may not be the same compared to online component being the requirement of course evaluation. For all of these reasons, the student and teacher interactions in developing critical thinking in face-to-face and online environments in this study may not be generalised to other EFL college students.

## 1.6 Significance of the Research

The significance of this research study was to bridge the gap between the concept of critical thinking and actual pedagogical practices available to teachers and students. In particular the study focused on both face to face interactions and using online interactions as a medium to encourage Taiwanese EFL students to verbalise their opinions and externalise their cognitive processing. The critical thinking development would contribute to the pedagogical development of educational technology application of online discussion for critical thinking in a local context of Taiwan. This research integrated the use of bilingual models and diverse models of face-to-face interactions with gentle transition to asynchronous and synchronous online modes of interactions in the critical thinking development process. The results of this study yielded insights into how to better modify class interactions to address cultural factors in EFL college students' critical thinking development in face-to-face and online environments in the local context of Taiwan. The following chapter will review the literature pertinent to this research study.

# CHAPTER 2

# LITERATURE REVIEW

*Rheingold states that the goal of an online community is to be:*

*'A place where everybody builds social capital individually by improving each other's knowledge capital collaboratively' (1998, p. 1).*

This chapter will begin with a discussion of the theoretical framework of social constructivism which underpinned this research study. The essence of social constructivism is encapsulated in the thoughts of Rheingold (1998) who maintains that knowledge is constructed socially and collaboratively.

Situated within the CHC context, the teacher-student and student-student interactions needed social construction, in conjunction with a CHC mentality, to remain silent before the teacher authority and maintain harmony in the process of exercising and verbalising critical thinking. This research study thus deployed social constructive framework to optimise critical thinking. The following part is the illustration of social constructivist approach.

## 2.1 Social Constructivism

Social constructivism assumes that knowledge construction and higher-order thinking evolve from the social interactions of learners engaging with others. The approach is based on the Russian linguistic-educator Vygotsky's (1960) proposition that language-mediated social interaction with capable peers and adults may stimulate students' cognitive development. Interactions within the social context help form new concepts, values and perceptions through verbalised intellectual exchanges. Through the relationship between language, interactions and cognition, social constructivists perceive critical thinking to be socially constructed and developed collaboratively through social interactions.

Constructivism is partially based on Kelly's (1955) 'personal constructs' theory which maintains that individuals interpret events by grouping them according to similarities and differences and assigning meanings by using interpretive schemes (Littlejohn, 1996). Constructivists believe that individuals construct reality through different mental structures, based on different cultural background, social exposure, prior knowledge and past experience, each of which helps them make sense of the world by categorising experiences (Littlejohn, 1996). Vygotsky (1978) further conceptualises the personal constructs as social in that interactions with others may influence how we perceive and interpret the meanings of events. Vygotsky's conceptualisation of the social factor in individuals' cognitive schemes is called social constructivism.

In his monograph Mind in Society, Vygotsky (1978) maintained that the key to higher order thinking /higher mental function development was through language-mediated, social interactions with other peers and the instructor. Language is the greatest tool and means through which human beings communicate with the outside world. Signs and symbols serve as psychological tools in a language-mediated communication process when perceived through Vygotsky's theoretical constructs (Kozulin, 1990). Hence, human cognitive development cannot be isolated from the language-mediated social interactions and symbol representation. Vygotsky (1960) stated that:

> Any higher mental function was external (and) social before it was internal. It was once a social relationship between two people … it appears first between people as an intermental category, and then within the child as an intramental category. (pp. 197-198)

Learners are not likely to perform mental processing beyond their level unless externalizing their ideas with others through speech. The externalising verbal interactions in social relationships often involves a cultural context in which thinking evolves.

Vygotsky's concept of mediating with a cultural perspective fits the purpose of this research study. Being Jewish by heritage and Russian by nationality, Vygotsky (1981) was aware of the cultural capital in one's learning environment. His cultural-historical activity theory suggests the importance of cultural mediation tools in cultivating higher mental

functions (Stetsenko, 2005). The mediation concept was further developed by his colleagues (Il'enkov, 1977; Luria, 1976) to suit differing cultural contexts to better connect individual mind with the culture. Ivic (1989) interprets this as the interconnectedness that helps students transform their critical thinking as teachers use mediated signs and language within the cultural systems to instruct. Teaching and learning are thus shared experiences socially constructed by teachers and students in a culturally acceptable context. This social-cultural perspective is particularly influential in the CHC learning context. The social-cultural aspect in teaching thus extends from interconnectedness between teacher and students, text and students, and student-student interactions.

Social constructivists perceive that critical thinking development is best constructed by social interaction. Nevertheless, as CHC teachers are ranked with heaven, earth, kings and parents in Analytics (Confucius), de-construction seems necessary in the social constructivist process to re-construct new power structures in the current contexts (Derrida, 2002; Leitch, 1983; McQuillan, 2000). Applying de-construction in a teaching context, Dewey (1954) urged teachers to critically question their 'blind spots'. De-construction in this current study refers to challenge what Dewey (1954) means by 'conventionalised and routine consciousness' of fixed teaching pattern (p. 183). Without this challenge on the teacher metaphor, it is unlikely that a teacher can be 'another traveler in the path' of students' learning process (Latham, 2001). De-construction was found effective in encouraging student-student interactions in the social constructivist approach for non-Anglo-Saxon cultural background (Merryfield, 2003) and for quiet students (Towns, Kreke, & Fields, 2000). This research thus applied a social constructivist approach to minimise a CHC influence in fostering critical thinking. The following section introduces the idea and concept of critical thinking.

## 2.2 Critical Thinking

What is critical thinking? Western literature shows a taxonomical categorisation conflict in the midst of a variety of terminologies for critical thinking, as some refer to the process as

higher-order thinking (Vygotsky, 1987), some as problem-solving (Abdullah, 1998; Jonassen, 2002; Picciotto, 2004; Zettergren & Beckett, 2004), some as reflective reasoning (Dana & Yendol-Silva, 2003; Kao, 2002; 1987; Thompson, 2002), while others as the top four levels of Bloom's taxonomy (Chiu, 2004b; Paul, 2003; Scriven & Paul, 1996; Stoner, 1997; Toledo, 2000). As noted in 1.2.1, critical thinking also has an affective dimension (Anderson et al., 2001; Krathwohl, Bloom, & Masia, 1964; Picciotto, 2004). Javis (2003) also relates social constructivism to critical thinking in advocating that teachers need to create socially constructed experiences in order to address students' affective needs as well as their cognition in encouraging critical thinking in a more holistic perspective.

In acknowledging the holistic nature of the critical thinking process, the following sections will illustrate the cognitive and affective dimensions of critical thinking.

### *2.2.1 The Cognitive Dimension of Critical Thinking*

In an early work on critical thinking Bloom (1956), identified six levels of educational objectives within the cognitive domain: knowledge, comprehension, application, analysis, synthesis and evaluation. In a recent revision of the seminal work by Bloom's partner Krathwohl and others (Anderson, et al., 2001), 'create' replaces 'evaluation' as the top objective, and 'evaluate' replacing 'synthesis'. In the revised taxonomy, the first thee objectives are merely changed from noun phrase to verb Knowledge—Remember (by recognizing and recalling from long-term memory), Comprehension—Understand, & Application—Apply: operate in real life settings. The following is the illustration of the other three objectives in Bloom's Original Taxonomy (OT) and Revised Taxonomy (RT), which are more relevant to the focus of this research study:

- (OT) Analysis: to break down a whole into different components, compare and contrast different parts, differentiate views and assumptions, search the pros and cons of a proposal and identify supporting evidence of a given statement. (RT: Analyse: in similar definition to analysis by verb phrase)

- (OT) Synthesis: to create a new whole by placing parts together, formulate one's own stance/view on issues (RT: Evaluate: exercise judgment based on criteria and standard, in verb phrase of evaluation)
- (OT) Evaluation: to make judgments about the merits or faults of ideas, assess the appropriateness of a statement, weigh the evidence and the conclusion drawn from it (RT: Create: put elements together to form a new and coherent whole, similar to synthesis).

The following table illustrates the critical thinking skills derived from 'analysis' and 'evaluation' by National Council for Excellence in Critical Thinking NCECT (Paul, 2003) and National Postsecondary Education Cooperative Sourcebook (Erwing, 2000). NCECT's work was partially based on the work of Bloom and his colleagues.

Table 2.1
Explanation of Critical Thinking Skills

| Critical thinking skills | Explanation |
|---|---|
| Identify problem points | Search the problems that must be solved |
| Recognise unstated assumptions | Check what is believed to be true in a statement |
| Distinguish facts from opinions/inference | Differentiate reality from people's thoughts about it |
| Identify background knowledge | Know the relevant knowledge needed to understand an issue |
| Check credibility & validity of the evidence | Examine if the evidence is true and valid to support a claim |
| Reach a conclusion by logical reasoning | Evaluate an issue and make a conclusion |
| by diverse sources of information | by consulting different sources of information |

Source: Selected from NCECT (Paul, 2003) and NPEC Sourcebook (Erwing, 2000)

As shown above, the first skill needed is the ability to identify the problem point in an issue. This begins the process of analyzing an issue (Scriven & Paul, 1996). Thinkers need to know the purpose of an idea and the problems that must be solved (Erwing, 2000).

Recognising the unstated assumption of an argument is a second important consideration to examine what is assumed in a statement before pointing out its logical fallacy. Next, distinguishing facts from opinions and facts from inference is also a critical thinking indicator. Further, it is crucial to identify the background knowledge needed to support a conclusion (Yeh, 2001; Yeh, 2000). This forms the fourth consideration. Without background knowledge, thinkers are not likely to have a mental concept of the larger context in which an issue is situated. Fifthly, it is important to check the accuracy, reliability of and examination of internal consistency of criteria helps to ascertain whether the reasons given to support the claims are persuasive or not (Zembylas, Vrasidas, & McIsaac, 2002). Finally, conclusions ought to be reached by consulting a variety of sources of information with logical consistency of the reasoning process and the use of terminology and concepts (Paul, 2003).

In Paul, Elder and Bartell's (2002) survey of 140 university teachers in teacher preparation programs in 38 public and 28 private universities in California, a gap was found between the perceived importance and the actual pedagogical practice of critical thinking in education. Critical thinking was commonly perceived by teachers as a primary goal of instruction (89%), yet only 19% gave a clear explanation of what critical thinking was, with only 9% articulating how critical thinking was incorporated in class. The study recommended incorporating critical thinking skills in classrooms by equipping teachers with systematic guidelines.

The affective domain considerations are also important in critical thinking (Anderson et al., 2001; Krathwohl et al., 1964; Picciotto, 2004). It is especially important in relation to the CHC context in which challenge, questioning and verbalisation are not encouraged in the affective domain of critical thinking process.

### *2.2.2 The Affective Domain of Critical Thinking*

In addition to cognitive development, the affective domain is an equally important aspect of the critical thinking process. Cultural background has been seen to influence students'

critical thinking development in a number of studies (Donnelly, 2004; McLoughlin, 2000; Vera, Shin, Montgomery, Mildner, & Speight, 2004). Tracing the second part of Bloom's taxonomy constructed more than 40 years ago, Bloom, Krathwohl and Masia (1964) confessed that the cognitive process could not be isolated from the affective domain. The fundamental difference between western and Chinese cognitive processing lies in individualistic and holistic approaches. De Bono (1985) has suggested that Chinese scientists were far in advance of the West by using all layers of different spirits to sort out phenomenon by explaining as a whole rather than dividing to the lowest denomination. Therefore, the Chinese way of thinking might be described as a holistic fashion, whereas western thinking is divided into components. Critical thinking thus may be heavily dependent on cultural and affective factors.

The affective domain of critical thinking might be described as including the following four characteristics: critical attitude, cultural consideration of conflicts, personality types, and a friendly atmosphere which encourages questioning.

*Critical attitude of the teacher*. Critical attitude is the self-reflection on bias and pre-disposition on an issue (Argyris, 1993; Argyris, Putnam, & McLain Smith, 1985; Ennis, 1985, 1987; Yeh, 2001; Yeh, 2000). Critical attitude refers to the affective disposition that is flexible (Argyis, 1982). It accepts different views and dimensions. Therefore, being aware of one's own affective disposition is important in judging implications during the critical thinking process. Zembylas Vrasidas, and McIsaac (2002) describe the characteristic as critical emotional literacy, 'the emotional attachments that construct our images and identities of both self and other' (p. 214). Zembylas Vrasidas, and McIsaac (2002) note that this critical emotional literacy is essential in helping online learners to step out from their comfort zone of viewing things in fixed patterns. Donnelly (2004) found in a North Irish high school that a teacher's attitude influenced students' critical attitude and cognitive flexibility to controversial issues. It is suggested that if teachers do not adjust their own values and beliefs, it is unlikely that they will remove their own and students' psychological barriers and prejudices in the critical thinking process.

*Conflict management: Gender.* Research on conflict management has found gender as an influential factor. Psychologists Vera, et al. (2004) found in an adolescent sample in high school context that male students were in greater need for interventions while females were found to rely more on verbal expression than boys. Students preferred to address conflicts either verbally or by avoiding confrontation, which will lead to 'follow-up' responses to conflict situations at a later time. Such characteristics raise the question as to how face-to-face conflicts in a classroom may lead to future online conflicts in the CHC context for EFL students.

*Personality and learning types.* Plalloff and Pratt (2001) found that not all personality types suited the role of online teachers and online learners. Successful online learners tend to be motivated, self-disciplined and older, with 'good thinking skills, an ability to work and do some amount of research independently' (Plalloff & Pratt, 2001 p. 109). A large proportion of active online learners are introverts in face-to-face classes. This is relevant to the CHC students' characteristics in verbalising opinions in classrooms. Hills (2003) also suggests individual learner's personality types and preferences in the learning environment may be important. While learner types may be useful, this research study did not explore students' personality types scale prior to the study for three reasons. First of all, the CHC cultural and social norms in Taiwan classrooms may have different learning expressions. Secondly, the fixed learning typology does not consider the possibility of characteristics and learning preferences change in different contexts. As relevant factors may include technology factors, class atmosphere, online dynamics, types of topics, and the impact from others' messages. It might be suggested further that the strength of extrovert characteristics may move quiet ones towards more extrovert and cognitively mature characteristics modeled by other members and the online facilitator. Thirdly, Hills' (2003) theory neglects the possible interactions of cognitive, affective and cultural differences from a western sample. Cognitive, affective and cultural development may evolve in very different patterns in Taiwan. The researcher thus chose to observe whether and how quiet and talkative students participate in online interactions.

*Question-friendly atmosphere: Wait time*. In addition to critical emotional literacy, Taiwanese distance educator Lee (1999), U.S. educator Stoner (1997) and Australian educators Godinho and Wilson (2004) emphasise the importance of creating a question-friendly atmosphere in students' critical thinking development. Lee found five months of exposure in an open, supportive and cooperative atmosphere helped Taiwanese students confront their own biases and assumptions. Teacher-student relationships and peer relationships also modeled risk-taking, analysis and openness to different ideas. Godinho and Wilson (2004) also found the importance of wait time; time for students to reflect and raise questions. Since wait time is a crucial factor in students' critical thinking development online (Hara, Bonk, & Angeli, 2000), the question of how much wait time is sufficient for critical thinking development in an online learning pattern might also be raised. Wait time may become 'silence' online. The pedagogical design inspired from this issue for Taiwanese EFL students is to allow non-embarrassing supportive small group discussions and some 'silence' of wait time before online class discussions.

### *2.2.3 Operational Definition of Critical Thinking*

In view of the CHC context, the researcher decided to add affective and cultural considerations in the operational definition of critical thinking to better suit the CHC context. This may offer more understanding and flexibility in viewing CHC students' interactions upon different issues. The following is an illustration of the operational definition of critical thinking to be utilised in this current study of college EFL students' critical thinking in Taiwan.

1. clarifying the problem point of the issue
2. identifying the background knowledge offered to support a claim
3. recognising unstated assumptions in a statement
4. distinguishing facts from opinions and inference
5. checking the credibility and validity of the evidence comparing and contrasting the stances of different sources of information
6. reaching a conclusion by logical reasoning diverse sources of information
7. showing cognitive flexibility and consideration of affective and cultural factors

involved in an issue (Donnelly, 2004; McLoughlin, 2000; Vera, et al., 2004)

The diverse aspects of critical thinking suggest that the affective domain may be the key to the success of students with a CHC learning culture. It may be that what is needed is the removal of student's emotional barriers to verbalising responses. This component lies in the affective domain, which will in turn influence students' cognition.

As this research study was situated primarily in an online environment to explore CHC students' critical thinking, the following part illustrates the considerations in relation to computer-mediated communication which informed this study.

## 2.3 Computer-Mediated Communication

Research has found that social constructivism is well situated in Computer-Mediated Communication (CMC) for critical thinking development (Jonassen, 2001, 2002; Rheingold, 1998; Salmon, 2002, 2003; McLoughlin, & Marshall, 2000). One of the early cyber writers Rheingold (1993) writing over a decade ago, provided a benchmark understanding of CMC in relation to virtual communities. From the original concept of the Electronic Frontier, Rheingold (2003) has expanded 'virtual community' to a recent work including a larger social transformation. He defined virtual communities as 'social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feelings, to form webs of personal relationships in cyberspace' (Rheingold, 1993, p. 5).

Three factors Rheingold (1993) found in building up the electronic frontier of virtual community are 'enough people,' 'carrying on public discussions long enough,' and 'with sufficient human feelings.' This description indicates the significance of the affective domain in maintaining continuous participation by sufficient members, within the online context. Connery (2002) refers to the open Internet culture as a concept of virtual coffeehouse. It is a useful illustration of a democratic forum to cultivate citizenship:

openness, with no closure of an issue after discussion. CMC encourages all opinions to be thoroughly challenged and fully checked.

Collaborative online cognitive tools of synchronous and asynchronous conferencing are also held to be effective in developing critical thinking (Astleitner, 2002; Jonassen, 2002; Sotillo, 2000). Jonassen (2001) advocates integrating the computer as a mind tool into the instructional system. He argues that integrating the computer in the curriculum through the use of collaboration provides meaning and effective knowledge construction to help transfer learners' reality from factual information to cognitive development in social interaction. CMC is capable of connecting students and teachers and encouraging them to better relate their new learning experiences for knowledge construction by sharing their previous experience and externalising their mental processes. In the digital age, the online environment is an appealing medium for college students' social learning (Liang, 2002).

### *2.3.1 Mindtools in Online Conferencing*

As McLuhan (1964) indicated long ago, 'the medium is the message', different modes of communication media lead to different communication patterns as the medium intercedes and extends the communication process (Levinson, 2000). Jonassen (2001) advocates that the computer is the tool that enables and supports the socially constructed knowledge process through student-student, student-teacher and student-text interaction. Thus he denotes the computer is a mindtool. As a medium or facilitator of discussion, the computer can assist those who would otherwise be intimidated by having to express an opposing opinion or viewpoint in a face to face situation by helping argument of for/against a viewpoint, challenging anothers' assumptions and negotiating the meanings of events (Wilbur, 1997). In its non-judgmental capacity as in the coffeehouse noted by Connery (1997), the neutrality of the computer does not encompass the nuances of voice tone, pitch, timing, nor the visual impact of facial expression to better disclose one's identity and real thoughts (Connery, 1997; Joinson, 2001; Watt, Lea, & Spears, 2002).

Knowledge construction is 'embedded in the social relations and identities of the learners as well as in the conversations and social discourse they use to make meaning of the activities and events they are part of' (Jonassen, 2000, p. 231). Critical thinking can be the

result of a socially constructive experience online in either synchronous and asynchronous conferencing modes.

Time is a critical difference between synchronous and asynchronous modes of electronic communication. The characteristic of time makes the nature of these modes fundamentally different. As research (Hara et al., 2000; Harasim, 2002; Stoner, 1997) points out, the factor of time in students' cognitive process is found to be important in mediated learning and distributed cognition.

*Synchronous Conferencing: Interactive.* Research suggests that internet mediation assists critical thinking development, particularly in the cognitive tools of a collaborative environment of synchronous and asynchronous modes of discussion (Astleitner, 2002; Frank & Davie, 2001; Sotillo, 2000). The following section examines the two common modes of CMC used in web technology applications: asynchronous and synchronous conferencing. Synchronous refers to online discussion happening at the same time (real time chat) in a single bounded timeframe, with all participants simultaneously connected. Asynchronous communication occurs at different times with participants logging on at their convenience and with resultant delays in responding pattern (delayed communication). While synchronous discussions are a more ideal online environment for social interaction (Chuo, 2004; Toyoda & Harrison, 2002; Walker, 2002), meaning construction and critical thinking is not fostered as strongly in synchronous discussion forums (Hara et al., 2000; Henri, 1995; Salmon, 2003). Hence, there exists a need to examine an alternative to synchronous mode as the mechanism for fostering critical thinking development. Asynchronous conferencing might be a worthwhile consideration.

*Asynchronous Conferencing and Critical thinking.* While synchronous conferencing seems to satisfy the needs of immediate social interactions, the time delays associated with asynchronous conferencing may contribute to further and/or deeper cognitive processing of learning issues. Early online content analyst, Henri (1989, 1992, 1995) categorised CMC into three types: interactive, quasi-interactive and monologues, which refer to students' contributions without discussing previous messages merely met the

minimum course requirement. The cross-referencing pattern to others' messages is the key to the level of interaction in her categories. Henri (1992) indicated that only 23% of messages interacted with others in the asynchronous mode in her study.

However, the majority of CMC are asynchronous (Hara et al., 2000; Walker, 2002)) due to the time-bound nature of students and lecturers and the 'reflective and constructive thinking' associated with many of the tasks in an online learning environment. With more time given for students to contemplate a posting, students may decide whether or not to comment on it and if so, how to respond to it and the possible result.

A number of findings from the research provide further considerations for exploration. Frank and Davie (2001) found that students who feel comfortable to write tended to dominate the voluntary asynchronous conferencing, while others tend to hold back and watch or 'lurk'. Further, Jonassen, (2001) indicated that whilst being advantageous in fostering better reflection, asynchronous communicators have a tendency to shift topics or misinterpret another's entry. Effective communication needs focused communication and shared understanding.

In Kao's (2002) study on students' and teachers' critical thinking in the web-enhanced course at Ohio State University, results showed that the levels most commonly utilised by teachers and students in both classroom and online environments are the cognitive processing levels of application and analysis, not synthesis. However, creative content often occurred in assignments undertaken offline due to the percentage of grade. Despite students' extraordinary efforts, the result implied that the amount of time given to students is even more crucial than the mode for their cognitive progression in critical thinking.

With all of the considerations above in mind, asynchronous discussions may assist in helping to yield a higher level of critical thinking (Hara et al., 2000). Asynchronous conferencing may help to overcome the limitations of time to reflect upon other students' ideas before commenting and composing their own messages. Reflection and critical thinking thus can be fostered in this mode of discussion. This research study deployed primarily asynchronous conferencing mode and supplement with synchronous mode to foster EFL students' critical thinking.

### *2.3.2 Online Structuring: Cognitive Support*

The CMC literature and research (Bullen, 1997, 1998, 2001, 2003; Jonassen, 2001, 2002, 2003; Jonassen & Carr, 2000; Lee, 2003) has identified a need to establish the structure of the online context and the design of the learning activities in order to encourage effective students online learning. While those researching CMC call the structure and design as 'scaffolding' (Cho & Jonassen, 2002; Cuevas & Fiore, 2002; Cummings & Bonk, 2002; Jonassen, 2002; McLoughlin & Marshall, 2000; McNaught, 2003), others from the learning design and theory areas (Ertl, Fischer, & Mandl, 2004; Gagne, 1985; Gagne, Briggs, & Wager, 1992; Kommers, 2004) call it 'cognitive support'. This research utilised the term 'cognitive support' in order to avoid the diverse associations applied and extended by different online pedagogies.

The following illustrates the dimension of 'scaffolding' associated with the provision of cognitive support from the CMC research. Originally grounded in Vygotsky's (1978) Zone of Proximal Development, scaffolding is used as a technique to structure activities designed to bridge the gap between children's existing level and the potential levels of understanding. Jonassen (2001, 2002) uses 'scaffolding' as an umbrella term in the problem-based context as a design framework for critical thinking using different mindtools: semantic organisation tools, dynamic modeling tools, information interpretation tools, knowledge construction tools, and conversation tools. While each mindtool can be used to foster different kinds of knowledge representation, Jonassen's (2002) scaffolding focuses on solving ill-structured problems in online simulation. Unlike Jonassen's analysing for problem solving, Salmon (2002, 2003) perceives 'scaffolding' as online moderating to encourage social interactions and supportive construction of knowledge and to minimise solely cognitive and behaviorist instruction. Meanwhile, other online authors like Norton and Norton (2005) and McNaught (2003) simply explain scaffolding as way to structure activities to meet online learner needs. The present research utilised 'cognitive support' instead of the term scaffolding to better describe the online support needed in critical thinking development in the context of EFL student learning.

Cognitive support was used in this research to represent cognitive assistance in all areas relevant to students' cognitive input, processing and output as Stoner (1997) mentions. Cognitive support includes the activities of computer-supported collaboration, framing an issue, defining a problem point, generate a statement, provide supporting argument with evidence and evaluation of the argument and evidence, ending with a selected conclusion (Jonassen, 2001, 2002). Among those, framing an issue is an influential one.

Jonassen (2003) states that framing an issue in a way to motivate students' narrative participation is important. The narrative format for problem presentation, as in storytelling, is an effective way to involve students because it immerses students in the real life context. Jonassen (2002) thus suggests giving space for students to 'manipulate or massage the problem in order to make it meaningful. Students can't assume any ownership of the problem unless they know they can affect the problem situation in some meaningful way' (p. 85). The researcher wondered whether framing an issue by providing local experiences may better encourage students' understanding of an issue and stimulate their effective online interaction.

In addition to providing interesting and relevant online readings, establishing minimum requirements and setting bonus opportunities for various components on an online task may assist in promoting effective online communication. As an example requiring a minimum number of postings to encourage online participation or providing bonus marks are commonly used strategies according to (Merryfield, 2003; Harasim, 2002; Hara et al., 2002; Vanderpool, 2005). Vanderpool (2005) found in her college science distance course that 40% of grade point based on participation led to 100% online participation, while only 25% of students contributed to face-to-face discussions in a class of 30. Nevertheless, setting minimum requirements may cause what Henri (1995) calls 'monologues' or 'quasi interactive' messages to meet the requirement. Therefore, this research study deployed bonus marks without setting minimum posting requirements to encourage critical thinking.

On the other hand, Bullen (2003, 2001, 1998) urges online educators developing online tasks to require collaboration and discussion rather than allotting higher grade points.

Bullen (2001) suggests dividing online discussion into small tutorial groups of 20-25 and keeping one class as a full online discussion involving all students. The notion of smaller groupings and interconnecting groups online might be effective. After discussing the cognitive support needed in online environment, the following section illustrates the interaction and critical thinking demonstrated in previous face-to-face and online studies on interactions.

### *2.3.3 Online Interaction and Critical Thinking*

In researching online interaction patterns, the CMC literature indicates numerous indicators which are available as criteria for the measurement of online interactions (Henri, 1992, 1995; Bullen, 1998, 2001, 2003; Hara, Bonk, & Angeli, 2002). The following section summarises the online interactions from participative, interactive, social, cognitive, and metacognitive dimensions from early online content analyst Henri (1995), extended indicators from Bullen (2001), Hara, Bonk, and Angeli (2000), with the face-to-face interactions suggested in Cazden's (1988) instructional conversational exchanges. The indicators of interactions in face-to-face conversations from Cazden compensates the limitations of online interactions with humanistic components to help the teachers be more sensitive to learners' paralinguistic indicators in order to help learners feel more accepted by the teacher and allow them space to develop supportive discussion climate. The following table illustrates online and face-to-face interaction and critical thinking indicators:

Table 2.2

Online & Face-to-face Interaction and Critical Thinking Indicators

| Authors | Henri (1995) | Bullen (2001, 1998) | Hara et al. (2000) | Cazden (1988) |
|---|---|---|---|---|
| Indicator of Interaction | • Participative: counting numbers and lengths of messages<br>• Social: participants' communicating relationship<br>• Interactive: measuring interactions, responses & how particular events lead to particular responses<br>• Cognitive: reasoning with critical thought<br>• Metacognitive: Self-reflection and self-awareness | • Number of messages by each individual<br>• Frequency of participation<br>• Number of cross referencing<br>• Number of students engaged in each discussion<br>• Intensity of interactions (mild, vibrant)<br>• Degree of critical thinking revealed in online discussion | • Question-raising and question answering pattern<br>• Frequency of individual students' contribution<br>• Interaction rate and chain of cross-referencing<br>• One-way or highly interactive<br>• Cognitive processing within messages | • Facial expression<br>• Gesture, Pitch, intonation<br>• Response of the listeners<br>• Class discussion climate: teacher praise, approving by nods and gesture<br>• Encouraging students after wrong answers<br>• Using students' ideas in lessons,<br>• Responding to students' need, & accepting their feelings |

While the five dimensions of Henri's (1995) and other researchers above presents a parameter for content analysis on the social and cognitive aspects of CMC, the CHC context may need consider how members interact with critical online messages and still maintain relationships with classmates they meet regularly in the face-to-face CHC classrooms.

### *2.3.4. Limitations of CMC*

Whilst CMC is a medium which encourages instructional interactions, it also poses some limitations in classrooms. Essentially it lacks immediate feedback (N. S. Chen & Lin, 2002; Hsieh, 2000; Kung, 2003a; Murphy & Coleman, 2004). Further Murphy and Coleman (2004) found the text-only format often led to misinterpretation. Their postgraduate students expressed difficulty discerning the flavour of a reply and avoiding

taking a comment 'the wrong way'. Difficulty also lies in the need for bridging mental process to externalised online text-format without the visual and verbal cues available in face-to-face communications (Hsieh, 2000). In view of these limitations, Chu, et al.(2003) suggest using a transition model to have face-to-face discussions first, then moving to Internet-supplemented model, and finally utilising an Internet-based model. With selected models and strategies, the provision of an open environment for students to interact with each other and foster critical thinking might be provided within the CHA context. The question of how to incorporate CMC in a second language field and a CHC context is an important issue, and is the focus of the following section.

## 2.4 Computer Assisted Language Learning

English has been the dominant language used to carry first hand information since the early phase of online development. In 1996, 82% of web sites were in English (Cyberspeech, 1997). However, the Internet is rapidly developing in countries like China and India (Warschauer, 2000). Warschauer (2000) criticises the problematic dominance of English on the Internet for non-native English speakers. In response to this situation, teachers of English as a Foreign Language (EFL) have also attempted to integrate the internet into language teaching in Computer-Mediated Language Learning (CALL) (Anchaleewttayakul, 2004; Chuo, 2004; Egbert & Hanson-smith, 1999; Li & Hart, 2002).

Merryfield (2003) suggests the use of online discussion to serve as a security 'veil' for participants to clarify opinions and challenge others behind the screen. While being an effective way to foster cross cultural communications in Merryfield's study, the concept of the online 'veil' in CALL might be interpreted in two ways. In the western direct perspective, a veil is something that 'covers up' a person if one views from the front. White (2000) also found that the online environment does not promote the traditional norms of accepting the teacher's viewpoints in face-to-face classroom environment. If this is valid in English native speaking environment, online modes would benefit students to a larger scale in a local context in Taiwan which is under the influence of the Chinese culture. There exists a need for EFL faculty to 'focus on interaction and critical engagement with

the knowledge and skills of using English' (Brady & Shinohara, 2003, p. 75). Therefore, in the CHC perspective, the computer is a veil that helps 'uncover' a person's real view with a screen protecting one's identity and security. This may help EFL students to cross over cultural boundaries and critically verbalise in online interactions.

Moreover, pedagogical support is also important in an EFL learning environment within a CHC context. According to Gabrielatos (2002), language teaching involves a triangular combination of teacher's style, teaching methodology and knowledge of language. Gabrielatos (2002) identifies key aspects of teaching methodology as the skills to incorporate theory into lesson plans with available materials and balancing support and challenge. Knowledge of language involves understanding different theories about language, and the sensitivity to learners' language level accorded by their own language use. Applied in this study, teaching methodology referred to how teachers used effective discussion questions to attract interests, the skills of integrating suitable texts, providing challenge messages and supporting and mediating teaching with suitable level of English instruction.

### *2.4.1 Synchronous or asynchronous in CALL*

EFL and ESL educators have debates about the usefulness of synchronous and asynchronous modes of interactions online. Without the human social interaction including eye-contact, facial expressions, tone, pitch and immediate face-to-face feedback, online environment discussions may be problematic in encouraging Taiwanese students' online participation in English (Feyten et al., 2002; Kung, 2003a; Mann & Stewart, 2000; Plalloff & Pratt, 2001; Tan, 2005; Warschauer, 2000).

In order to establish social construction online in EFL/ESL, Kung (2003b) and Sotillo (2000) found the use of synchronous (real time chat) conferencing tool effective for immediate interactions, idea generation and language fluidity close to real life conversation. Taiwanese EFL educator Kung (2003a) utilised synchronous online chat paired by Taiwanese EFL students and American volunteers and found synchronous mode to be effective in producing interactions. Despite problems of sustained participation,

Kung found synchronous online interactions in turn augmenting face-to-face discussion in the Taiwanese EFL context. ESL educator Sotillo (2000) found a synchronous mode of interactions helpful for language learning by its immediacy and fluidity. Kung found a social factor at work in Taiwanese EFL students' chatting with English native speakers. Thus, a synchronous model may serve EFL students as extended speaking and writing practice compared to asynchronous conferencing.

In Sotillo's (2000) research of English as a Second Language (ESL) learners, the synchronous discussions exemplify the types of interaction similar to face-to-face conversation needed in language learning, yet with lower accuracy in English grammar and complexity in syntax. There are also three disadvantages of synchronous discussions found in Sotillo's (2000) research. First of all, while changing the slow motion of conversation to rapid-fire exchanges in the discussion, synchronous mode is not as focused in topics due to intervention with requests of information (14%), responses for clarification and agreement (44%), assertions (15%), greetings (4%), as well as topic shifts (2%). Secondly, the loss of chronological interaction input poses difficulty for researchers to fully analyze the evidence of lexical, syntactic and morphological characteristics by ESL learners. Finally, there are few long messages posted, which normally require more attention and critical thinking in processing the resources. There were only 4% of adversarial moves to argue against a stance in the discussion. Critical thinking was not found in-depth in real time interactions online.

Meanwhile, Toyoda and Harrison (2002), Anchaleewttayakul (2004), Chuo (2004), and Chiu (2003) found asynchronous mode effective in online language learning. In their study of online chat with native Japanese speakers, Toyoda and Harrison (2002) found lack of in-depth mental processes before typing out responses and more grammatical mistakes. They have classified difficulties in real time interactions into nine major category in their discourse analysis method: 1) new vocabulary, 2) misuse of a word, 3) pronunciation error, 4) grammatical error, 5) fragmentation, 6) abbreviated sentence, 7) sudden topic shift, 8) delay response, and 9) inter-cultural communication gap. The requirements for successful foreign language performance need more than linguistic and semantic support in

synchronous conferencing. The interrupted utterances with low grammatical accuracy in the synchronous chat texts were caused by the language learners' incapability to respond without reflection time.

Anchaleewttayakul's (2004) Malaysian study indicates that asynchronous mode was found effective in EFL Web-based learning, while Taiwanese educator Chuo (2004) also found the asynchronous mode useful in improving EFL students' motivation and writing quality. In Chiu's (2003) EFL study in the Taiwanese context, while improving students' English reading comprehension, in-class browsing and online discussions did not generate in-depth critical thinking messages. In view of these finding, critical thinking can possibly be better fostered in an asynchronous mode of interaction, giving time to read the hyperlinks, others' messages, reflect thoroughly and pose arguments.

### *2.4.2 Face-to-face Integration in modified social constructivist model*

While social constructivism is a commonly utilised approach to online discussion, an important issue concerns how online teachers in the CHC context need to reposition themselves to help students to adapt to criticism in public. The combination of face-to-face and online learning is stressed by Taiwanese EFL educators Yang and Chang (2003) and Taiwanese computer science educators Chen and Lin (2002). Yang and Chang found in the high school make-up English classes that students preferred an alternating online model with face-to-face model, followed by online model in learning English. In this model students first read English texts as web pages, then switched to face-to-face discussion with peers with the teacher's clarification of problem points and finally engaged in online discussion of English writing. Similarly, in the case of Chen and Lin (2002), the master's students in the distance information system class recommended teachers to arrange face-to-face meetings sometime during the semester to establish a sense of community, increase online learning motivation and foster online interactions.

Taiwanese Open University educator Lee (2000) also suggests that teachers offer face-to-face verbal encouragement in the tutoring sessions. Teachers' active participation in the online discussions in the initial phase is also an effective way to motivate students' online

participation (Lee, 1999). A further case, in Singapore, of low interactions in synchronous discussion may indicate a demand for a higher degree of teachers' involvement in the CHC context. The Singapore study on combined mobile and web-based e-discussions (Lim et al., 2002) found college students urged the instructor to take a more active role in guiding their discussions and helping them in a conducive environment. The researcher perceives that a social constructivist approach may need modification in the CHC context where verbalising critical thinking is not a social norm in the presence of authority. While teachers need to encourage students in a face-to-face environment to better engage them in critical participation, the teacher's style also plays an important role in students' participation.

### *2.4.3 Teacher's Style*

Teacher's style is a crucial factor in students' online interactions with the teacher and among students themselves (S. A.Walker, 2004; R. Walker, 2002; Coffin, Painter & Hewings, 2005). Teachers need to reposition themselves to the new mode of the online environment. Teachers are not readily seen as having authority above students in an online forum (Rose & McClafferty, 2001). According to ESL online educator Merryfield (2003), teachers' online role is less-authoritative, thus online discussions serve as a 'veil' to cross cultural boundary. Merryfield found this online 'veil' providing Non-Anglo-Saxon learners security to help overcome cultural barriers in explicitly challenging others and the teacher. In an English as a Second Language (ESL) and EFL context, this new mediated learning has the potential to reduce anxiety over English pronunciation and speech performance in public, allowing greater cognitive readiness to interact by giving sufficient time and process resources to critical thinking without the influence of physical attributes or cues, through written communication (Kung, 2003a; Merryfield, 2003). Norton (2000) also advocates ESL teacher's sensitivity to teacher authority due to a strong affective factor that influences EFL learners' perception of the socially constructed opportunities to speak up. Norton found negating ESL learners' identity prevented them from fully participating in the classroom communication for English language performance is closely related to learners' perceived identity.

While it is recommended that the teacher's style should be sensitive and less authoritative in CALL classes (Coffin, Painter, & Hewings, 2005). Coffin, Painter and Hewings' study on U.K. Open University master's students found a teacher's challenging style fostered students' critical online participation pattern. Using a social approach to building up trust and sharing personal experience led to students' sharing a short and socialising message pattern. On the other hand, the teacher who modelled formally structured challenges and debates cultivated twice the postings and twice the frequency of responses to previous messages. The latter group's postings were three-times as long as their first group counterparts. Argument was the major type of content. The number of challenges and counter-argument messages was six times more than the first group. Although UK teachers and students may have different cultural attributes and thus be more accepting of challenge, the teacher's modelling of challenge is influential to students' online challenge pattern and critical thinking. Therefore, it can be suggested that special attention needs to be given to challenge messages and counter-argument messages by teachers and students in exploring the development of critical thinking.

### *2.4.4 Impact of CHC in Discussing in English Online*

The online study of Bloch (2004) found Chinese writers in North America developed a complex discourse and mixed value system in a USENET as a response to a biased report of U.S. TV network CBS on Chinese related issues. These Chinese online writers formed collective voices in response to the television item by using a variety of rhetorical strategies, successfully pressing the television network to meet them. The strategies varied from the western value of fighting back to the employment of the Confucius mentality of promoting harmony. However, writers in Taiwan struggle in debating issues in a language (English) embedded with the culture that allows them to violate the CHC traditional norms of non-argumentation. EFL teachers thus need to be sensitive to the conflicting values of CHC silence and a western confrontation style in discussions in developing non-CHC forms of communication to express their thoughts.

### *2.4.5 Intermediate level as ideal online learning*

As Li and Hart (2002) also point out, the internet is an effective medium to supplement particularly intermediate EFL/ESL students' learning. Lower-intermediate students may need more handholding in the learning process. As lower-intermediate students may not be able to post independently without the teachers' support, the current study sought to recruit intermediate EFL students in the online discussions on current issues in English because of the language proficiency and critical thinking needed.

### *2.4.6 Length of EFL expressions*

Coffin, Painter and Hewings' (2004) study found the average length of posting of the group with more argument messages was three times that of the group with more personal sharing and solidarity building. Messages of disagreement tended to be the longer and exhibited more critical thinking indicators.

### *2.4.7 Bilingual Ttransition Model*

In the language learning environment, Goetz (2003) found the Chinese-English bilingual model useful in promoting English speaking. This bilingual model transited young Chinese speakers from a Chinese environment to an English one by increasing cognitive input and meta-linguistic exercises. It suggested a gradual model as being crucial to facilitating students thinking in Chinese to express concepts in an English environment. Based on this idea the current research thus argues that in the online environment, EFL teachers may allow students to use both Chinese and English texts in the initial phase of interaction and discussion and gradually transit the cognitive process into discussing thoughts in an predominantly English environment, finally achieving a comfortable phase of understanding in verbalising in English.

As a result, the creation of a suitable environment is the key role of teachers as non-dominant facilitators in online communication. EFL teachers need to select suitable modes

of online interactions, integrate face-to-face interactions, use a bilingual transition model, choose a suitable level of texts and be sensitive to the CHC boundary in online discussion.

In using computers for higher order thinking, tertiary educator researchers across disciplines (Chu et al., 2002; Egbert & Hanson-smith, 1999; M. C. Lee, 2003) proposed that the teacher-student relationship be re-defined. Seeking divergent thinking rather than a standard response is an alternative to the norm of convergent answers, which would need teachers' cognitive modeling and affective support. This is often achieved first in face-to-face learning environment. Exploration of teachers' facilitation of students' interactions which address cultural and affective factors is a critical issue that may yield culturally appropriate pedagogical patterns for cognitive transformation for Taiwanese EFL students. In the social constructivist approach, learning is achieved not individually, but by the dynamic interactions between the socially negotiated meanings derived from the student-student and student-teacher interactions.

In describing these interactions a framework is required which will allow for the full richness of the episode is required. The following section explores the use of metaphor as a framework to better describe the teacher-students interactions and a teacher facilitator's role within the CHC context.

## 2.5. A Framework for Analyzing Online Interactions: The Use of Metaphor

As online interactions and silence are as dramatic as in theatrical performances, this part of the thesis reviews literature pertinent to using metaphor in analyzing online interactions. The first framework deployed was a garden metaphor used to re-name students and illustrate the developmental phases of online interactions. The next framework utilised in this study was a shepherd metaphor to represent the role of facilitator in analysing subtle online interactions within the CHC context. The following is a brief introduction of the notion of metaphor.

The use of metaphor can lead to a new perspective and serve as a new frame in viewing something (G. Morgan, 1996). G. Morgan maintains the transforming effect of metaphor in viewing an entity:

> Metaphor, as a primal process, is ontological. It belongs to the realm of 'Being.' Metaphors are epistemological, in that they give us specific frames for viewing the world. By changing our metaphors we can learn to 'see' and understand in different ways and gain different kinds of knowledge. (p. 228-229)

Applying metaphor as a new viewing frame, Holkner (2002) and Causey (1999) created new knowledge from metaphor in online interactions. Causey (1999) puts forward the idea that the online discussion forum is the cyber stage for online actors' performance, which is their online interactions. Similarly, Holkner (2002) applies the actor network theory in the online discussion context in which online members are online actors interacting and interconnecting with one another as the computer network. It helps present the descriptive narrative framework developed from the metaphor.

In the present study, the metaphor of plant evolution and growth was used in describing how online participants may gain confidence and strengths in exercising critical thinking skills normally not brought forth in public in the face-to-face environment within the context of CHC. Further details of analysis frames will be introduced in 3.5 Data Analysis.

### *2.5.1 Online Facilitator: The Shepherd*

With the social and cultural factor involved in the social constructivist framework, teachers in a CMC environment are recommended to take a role of facilitator (Cheng & Yeh, 2000; Chiu, 2004; Huang, 2001; Rheingold, 1998; Salmon, 2002; W. C. Yeh, 2000). As social constructivism assumes social interaction as the primary source of knowledge construction, teachers can no longer assume to be the authority, but facilitators. What exactly is a facilitator? The Oxford English Dictionary (2005) defines 'facilitator' as 'A person assigned to facilitate progress towards a specific objective, *esp.* one whose role is to foster communication or understanding within a group of people, or negotiations between various parties; a mediator; a coordinator especially of a conference, discussion group, etc'.

Therefore, according to Oxford's definition, facilitators have multifold roles to play: assisting goal-oriented progress, communication, negotiations, mediation and coordination of group discussions. Meanwhile, Berge and Collins(2000) expand the online moderator's role to other aspects in the following selected list for different roles in non-academic settings (marketing related role omitted):

- facilitator (peer discussion participant, mediator)
- manager (administrator, archivist, deleting/adding subscribers)
- expert (answering; expert in the list's topic)
- discussion (poses questions, keeps discussion 'on track')
- helper (helps people with needs–more general than expert )
- firefighter (rejects 'flames' or protests)

To sum up the tasks of moderators and facilitators, they are the online guides to assist and support a group in learning, discussing and in the thinking process along a verbalised thinking path. It is leadership by nature, yet without the dominance of power in leading, cultivating and collaborating individual's cognitive and affective contributions, which is similar to the work of a shepherd.

A selection of Rheingold's (1998) metaphors of an online facilitator as an online host illustrates what McCormick and Davenport (2004) describe as shepherd leadership. According to McCormick and Davenport, the leaders on the cyber stage need to be shepherd-like leaders with vision for the group, decision-making and ability to guide the flock with individual attention. The biblically-based example of 'shepherd' model leadership including the skills to

- Call students by names
- Listen to their voice
- Lead them by example
- Search the lost flock
- Exercise group leaders with discipleship

The following is the illustration of a shepherd-facilitator, drawn on primarily these two

books and other relevant literature on the role of facilitators:

*Calling them by name.* 'As a shepherd knows each of his sheep, he calls them by names' (John 10:3). Names symbolise the person, the identity, and expectations from parents. In online context, Rheingold (1998) notes the importance of acknowledging other people by name in responding and cross-referencing others' online messages, if with good will helps building trust. Therefore, calling online members by name is an important step in establishing trust and demonstrating teacher-student relationship by showing the teacher facilitators' pastoral care and interest in students themselves, more than in their performance and contribution online. This is the building of a teacher-student relationship similar to Towns, Kreke, and Fields' (2000) finding that the priority in facilitating small group discussion was forming relationship with a sense of community. This increases the individual's confidence level and fosters mutual commitment with inter-dependence within a group.

*Attentive listening to the needs of the sheep.* 'Be sure you know the condition of your flocks, give careful attention to your herds' (Proverb 27: 23). After calling the sheep by name, the shepherd learns to first listen to the sheep's voice to know their needs before being able to exercise leadership to guide them and influence them. U.K. online educator Salmon (2002) includes the affective objective of motivation and access in phase one and online socialisation in phase two to better help students know one another and satisfy their affective needs in human interactions online. More of her work will be detailed in the section of 2.5.2 Different Phases in Online Facilitating.

In the CHC context, Bloch (2004) found some online Chinese writers hesitated to confront and defend in online debates due to CHC non-argumentative norm. Thus, teachers need to be aware of the struggle students may experience in engaging in online discussions so that students may listen to them and follow them. In another undergraduate web-based study in Taiwan by Chiang (2002), it was the higher achievers seeking answers from online browsing, while their lower achieving counterparts sought help from tutors and teacher. This could be an indicator of the varied amount of cognitive support needed from the teacher among students of different levels. Online facilitators need to attend to different

students' needs by observation and communication before setting up cognitive models for different students. Understanding them is the prerequisite in shepherding: 'My sheep hear my voice, and I know them, and they follow me' (John 10:27). The next skill is setting up the model for them to follow.

*Setting up the best route and models to follow*. 'The Lord is my shepherd and I shall not want. He makes me to lie down in green pastures and leads me beside the still waters' (Psalm 23: 1-2). Both Rheingold (1998) and McCormick and Davenport (2004) believe in leading members by guiding and cognitive modeling. Setting up the best route and models for members to follow is a pedagogical and cognitive issue. Applying this leadership in the cognitive development in an online context, a facilitator knows how to lead new comers and link members to right resources with previous authors.

'A host is also a cybrarian. Good hosts nurture the community memory, pointing newcomers to archives, providing links to related conversations, past and present, hunting down resources to add to the collective pool of knowledge -- and teaching others to do it. Well performed voluntary cybrarianship is contagious' (Rheingold, 1998, p. 2). Successful leading in selected cognitive input and guiding discussion is cognitive modeling. As members are well guided, they will extend from socially constructed cognitive input base to critically think through an issue. Rheingold (1998) illustrates that good facilitators set up good examples online in several aspects: careful reading of others' messages, posting messages in an interesting and informative way, add knowledge, and help problem-solving. Effective leadership involves good modeling in guiding to the right path, yet some are yet to be there.

*Searching the lost sheep: Mobilising the lurkers*. 'I have other sheep that are not of this sheep pen. I must bring them also. They too will listen to my voice and there shall be one flock' (John 10: 16). The 'other sheep' in the online context refers to online quiet observers 'lurkers' who do not verbalise in the online discussion. Encouraging 'lurkers' in the group discussion has been an issue discussed by educators and group discussion leaders (Salmon, 2002; Towns, Kreke, Fields, 2000; Rees, 1998). It is particularly significant in

the CHC context since silence (lurking) is a cultural norm.

In an early study by Taiwanese EFL teacher Tsay (1997) on critical thinking and face-to-face group discussions, she attributes the lack of enthusiasm in participating in class discussion to the following factors:

- Students are not culturally accustomed to raising hands to speak up or verbalising their thoughts in public.
- The need of cognitive input: few students contributed in the class discussion due to the lack of understanding of the class material, which is similar to Towns, Kreke, and Fields' (2000) finding.
- The fear of independent thinking and learning: students express anxiety of learning on their own and being evaluated on their own, which is a good indicator of the legitimacy of social constructivist approach.
- Difficulty of critical thinking: students indicate that critical thinking is time consuming and cognitive challenging and exhausting to think critically and if possible, they would choose not to exercise critical thinking (Tsay, 1997).

This lack of comprehension and initial participation would lead to a negative spin of a silence spiral for the quieter ones and a dominant spin of the more verbal ones in the face-to-face class discussions. As Towns, Kreke, and Fields (2000) found in students' perceptions of the small group collaboration in a science college that quiet students did not have the courage to jump in to ask for clarification or seek assistance. As a result, the shepherd's leadership with care and patience is an important task in providing affective and cognitive assistance to break through their silence and move to participation.

While Salmon (2002) notes e-moderators need to mobilise lurkers' participation, Berge (1995) advocates acknowledging lurkers who may learn as well by listening to others and gently accepting students' comments without using sarcastic humor due to different cultural factor. As it is a cultural norm to be silent in public, the researcher would not force participation, since lurkers' critical thinking may develop along with those active participants. However, the researcher ponders whether there are ways to gradually help

less verbal students to cross the boundary to verbalise their thinking first online and then in face-to-face environment.

Distance educators Chen and Craven (2003) recommend using a connecting voice as a way to convey care for students through written communication online, willingness to help, patience, sensitivity to students' feelings, sense of humor and being adaptable with instructing online. Meanwhile, Rees (1998) suggests facilitators the following strategies to cope with the quiet members: using direct, but gentle approach to call them by names, opening with a non-threatening icebreaker that requires them to speak, giving examples to help them understand, offering them a structure to start with, dividing the group into pairs or subgroups to increase opportunities for sharing, avoiding judging anyone's input or filling in silence and thanking for their contribution as positive feedback.

Taiwanese distance education researcher Chiang (2002) points out an active online participant's complaint about the facilitator pressing all to post more during their cognitive processing period. Students need to be acknowledged for the efforts put in online learning process even if not posting any message yet. It is necessary to let the students feel that teachers care about them and the learning process rather than the quantity (or the absence) of online output. Also, Rheingold (1998) suggests online facilitators to be patient: delaying one day on emotional responses, to be slow to anger, apologise when wrong, and politely ask for members' clarification. In view of this, how teachers encourage silent ones by addressing cultural and affective factors is a critical issue that may yield culturally appropriate pedagogical patterns for CHC students. The teacher's relationship with students is the focus of the next section.

*Establishing a relationship with leaders first.* McCormick and Davenport (2004) illustrate a strategy to look for the potential leaders and establish a relationship with them first and later they will model after the leadership. Similar to discipleship, potential group leaders once being appointed with clear mission will follow the leader's vision, values, beliefs and practice. These group leaders will adhere to the teacher's pedagogical design. Their example will in turn draw other members to follow on at a later time. This cognitive

spin starts with exercising leadership by establishing close relationship with the leaders. In an educational context, the practices are effective in guiding the sheep from the front. This may post some practical dilemma as teaching by itself is time-consuming. The student leaders were important in Chiang's (2002) study of college students' learning patterns in an asynchronous distance environment in Taiwan. Students reported that small group interactions with a senior students' tutor facilitating were the most effective in helping them clarify problem points and direct online discussions. In view of the class size and the lack of time for a teacher to attend to all students' needs, she thus suggested future educators to deploy the mechanism of small group leaders as online facilitators to guide students individually for maximum social constructivist learning.

Facilitators need to be actively involved before and during the discussion session to be attentive to ongoing messages and stimulate ideas flow as a catalyst. To sum up, online facilitators need to play the role as shepherd leadership in calling students' by name, attending to their needs, leading them by cognitive modeling, searching the lurking ones, and exercising group leaders training while moderating discussion online. In the CHC context, facilitators need to further encourage students' critical online participation to cross the CHC boundary on controversial issues. In view of the need of facilitating in online discussion, the next part will illustrate teachers' facilitating role at different phases of online discussion.

### *2.5.2 Temporality: Different Phases in Online Interactions*

CMC literature indicates the notion of temporality in different phases of online facilitating (Salmon, 2002; Harasim, 2002; Kao & Chen, 2003). Based on the experience from the Open University in U.K., Salmon (2002) provides a five phase theory for e-moderators to facilitate interactions at different phases in online discussion progression. On the other hand, Harasim (2002) and Taiwanese distance educators Kao and Chen (2003) use the three-phase chronological model for online development. The researcher lists the three models as references to online discussion development and progression in the following table 2.3. The author does not assume that Salmon's five stage is equivalent to Kao and Chen (2003) and Harasim's (2001) models in the table. Salmon's model is chronological in

her five stage chronological progression with different purposes, and the other two models are also chronological. The aim of the first phase of online interactions is idea initiating and motivating online members to participate online. It is thus not illogical to reference Salmon's stages I. Access and II Socialisation to Harasim's 'Idea initiation' in phase one and Kao and Chen's 'Encouragement' and 'Open up teamwork'. Next, the middle phase is to encourage focused discussion and allow more in-depth exploration on diverse and opposite opinions during the information exchange. Salmon's stages III. Information exchange & IV Knowledge construction are similar to Harasim's 'Idea linking' and Kao and Chen's 'In-depth exploration'. The final phase is to conclude the discussion in collaboration, often in group projects. Salmon's stage V. Development is open-ended furthering of the online discussion, thus functions similar to Harasim's 'Collaborative task' and Kao and Chen's 'Group project' in their last phase in the developmental sense of an online community. The following is table (Table 2.3):

Table 2.3

Different Phases of Online Interactions

| Models/Phases | First Phase | Middle Phase | Final Phase |
|---|---|---|---|
| Harasim (2002) | Idea initiation<br>Sharing diverse opinions | Idea linking | Intellectual convergence<br>Collaborative task |
| Kao & Chen (2003) | Support<br>Encouragement<br>Open up teamwork | Consensus taking<br>In- depth exploration | Concluding<br>Evaluating<br>Group Project |
| Salmon (2002) | I. Access & motivation<br>II. Socialisation | III.Information exchange<br>IV. Knowledge construction | V. Development |

While the phases above are generally true to online interactions, there are some considerations in a CHC learning context. First of all, to have the first phase occur in CHC classroom, some changes are needed to remove CHC students from their comfortable boundary of silence. To initiate idea exchange, students need to first believe that they are capable of constructing knowledge. In addition, students also need to be aware that it is socially acceptable to verbalise and challenge others' opinions. This occurs in the second phase. Thirdly, it is not necessary to for students of different backgrounds to have reached agreement or have an agreed-upon thought in a social-constructivist learning environment. As students interact with one another's ideas online, the quality of their critical thinking develops during the three phases of discussion with teacher's facilitating. The following section discusses facilitating techniques.

### *2.5.3 Facilitating Techniques*

Facilitating takes time, and can tie a moderator to their list as daily duties. Without a teacher's effective facilitating, the common culture presented in cyber space would be the same as in the CHC quiet class atmosphere. In terms of how exactly to facilitate during the discussion session, Taiwanese educators Kao and Chen (2003) suggest teachers modify the

group dynamics theory for the online discussion. These researchers conclude with pedagogical guidelines for facilitating asynchronous online discussion at different phases.

- Supporting technique: supportive: positive reinforcement and encouragement for open-up contribution and sharing in a new context, as the most frequently used leading skill throughout discussions
- Suggesting technique: providing more information, and alternatives and thinking patterns to help develop cognition, attitude and behavior with a multitude of perspectives
- Interpreting technique: explaining and clarifying some views to help understand new viewpoints and issues
- Linking technique: connecting and making relevance of members' viewpoints to draw common ground for corporate problem-solving
- Limiting technique: focusing within a boundary away from irrelevant query, privacy violation and verbal attack
- Emphasising technique: exposing the reference framework of a member to increase understanding among them for trust and better interactions
- Evaluating technique: assessing group dynamics and discussion progress for insight on ongoing and future discussion development
- Timing technique: knowing when and how to proceed intervention, keep the discussion moving in a positive and timely fashion (Kao & Chen, 2003).

With the focus of critical thinking, the facilitating techniques probing and challenging are also identified in facilitating online interactions for critical thinking (Pilkington, 2001; Walker, 2002; Walker, 2004). Walker (2004) states the need for teachers to use Socratic strategies and play the role of the devil's advocacy in the online discussions. He found teachers' 'challenging' and 'probing' most effective in eliciting students' further clarification of their argument in his online interactions study of U.K. teenager sample. Teachers' agreeing messages did not receive any students' further responses, yet challenge messages received 57.7% of single responses and probe messages received 62.1% of responses. While using a challenge technique, the teacher also utilised 16 encourage messages and 24 inform message to provide students affective and cognitive support.

Other educators also identified the importance of challenge in analyzing the exchange structure in online interactions (Kneser, Pilkington, & Treasure-Jones, 2001; Pilkington, 2001). The following is the introduction of probing and challenging techniques:

- Probing is verbally requesting the furthering the previous statements. Rees (1998) points out several forms of probing: requesting clarification, explanation, examples; encouraging in depth reflection; exploring a concern that may otherwise be neglected; and searching the root of an issue. Nevertheless, Rees warns the possible negative impact of probing in making people feel being interrogated or leaving out the rest of the group in the dialogue.
- Challenge is a statement which aims to elicit more support and evidence in the line of argumentation for a stance. The assumption check instrument is a simple, yet effective strategy to help challenge individuals' cognition (Godinho & Wilson, 2004). Marsick and Watkins (1999) suggest questions such as 'You seem to assume…when you state….How can you check out these assumptions?' 'What differences would it make if these assumptions are not validated?' 'To what extent can we challenge these key assumptions?' A challenge technique helps detect the unexamined reasoning behind individual's statements to open up opportunities for critical thinking.

As critical thinking starts with asking critical questions, provocative questioning in probing and challenge techniques can foster students to think critically. Guiding students by asking questions to further explore an issue is more effective than giving an answer directly (M. H. Chen & Craven, 2003). The facilitating techniques of supporting, suggesting, interpreting, linking, limiting, emphasising, evaluating, timing along with probing and challenging would be the repertoire for online facilitators to utilise in fostering critical thinking and existing interactions. The following section will introduce techniques to manage flaming and encourage those silent.

### *2.5.4 Flames and Silence in Online Discussion*

Flames are personal attacks common in a digital medium, especially in online discussions (Salmon, 2002). While unavoidable, flaming is not a positive factor in building an online community. Some literature shows that teachers take the role of firefighter in flaming (Berge & Collins, 2000; Rheignhold, 1998). Nevertheless, Wilbur (1997) observes online members used silence to counter against flames of severe criticism on agreed upon mental processing. The tactic of silence is deployed to close down some controversial discussion topics to avoid flames perceived as destructive to the community. While contrary to CHC silence and harmony principles, it is a helpful alternative way to perceive conflict as a means to enrich the scope and silence as a process to deepen knowledge. Since the silence in online discussion is a response to flaming and the CHC social norm is also silence, the researcher thus ponders whether particular flame management would either lead to silence or further exploration of diverse angles of an issue and how silences evolve in CHC virtual community.

### *2.5.5 Debating*

Taiwanese educators Cheng and Yeh (2000) found that debate was an effective pedagogical mode to cultivate college students' critical thinking. Analysis skill and ability to verbally express thoughts greatly improved in debating controversial current issues in the local context. Students learned to check the accuracy and validity a variety of sources of data, cross examine the evidence, and analyze the disadvantages and advantages of an issue. The 'how' and 'why' questions particularly helped students critically judge and evaluate different dimensions of a complex issue beyond the surface factual processing. Successful speech presentation also required non-verbal elements to effectively present an issue including eye contact, delivery tips, vocal quality and self-confidence that not every student possessed.

In view of the pedagogical implication, integrating modes of face-to-face small group discussions and asynchronous online discussions may best trigger interactions and critical

thinking. Applying debates to this current research setting, the researcher looks for modes of interactions fostering critical thinking in English by alternating online and face-to-face interactions. How to inspire students to contribute and refute different ideas online is a pedagogical issue for EFL teachers deploying Internet-mediated interactions.

## 2.6 Summary

Based on a social constructivist framework, critical thinking is best mediated in social interactions with a cultural context. Online social constructivists advocate using synchronous and asynchronous discussion modes as mindtools to foster cognitive development. However, some EFL educators dispute the selection of interaction modes and the need for face-to-face integration within the online interactions framework. With the focus on critical thinking, the researcher attempted to explore a variety of combinations of modes of interactions to ascertain critical thinking and interactions. Different facilitating skills were also found effective at different phases to help teachers facilitate students' cultural, affective and cognitive obstacles in expressing critical thinking in EFL classes. The researcher thus wondered how the interactions of teacher and students in face-to-face and online interactions may affect critical thinking development in EFL class in Taiwan.

The literature and the researchers past experiences in the online environment led to the formulation of the following research questions which guided this study.

## 2.7 Operationalising the Research Questions

In view of these, the overarching research question of this research study as stated in chapter 1 was:

1) How do student and teacher interactions impact critical thinking in face-to-face and online environments in an EFL course in Taiwan?

To specify the research question within the teacher authority background, the researcher

attempted to explore how a teacher may facilitate online and face-to-face interactions to better help critical thinking development in CHC context.

The first sub research question was operationalised by the following:

1. How does a teacher facilitate EFL students' online interaction for critical thinking in news discussions in Taiwan?

In regards to the debate between synchronous and asynchronous modes of interactions and face-to-face integration in online learning, the next question was thus:

2. How do different modes of interactions impact on students and teacher online interaction and critical thinking?

Based on the review of the past and current literature, this research study aimed to explore the interactions of teacher-student and student-student in both face-to-face and online learning environment. The methodology and methods used in the study will be discussed in the following chapter.

# CHAPTER 3

# RESEARCH METHODOLOGY

*Freebody (2003) found education and educational research as the intersection of "reflecting and doing education as cultural practices relevant to both participants and the researcher" (p. 67).*

This research study was framed as s case study. According to Yin (2002), a case study is an empirical inquiry which investigates a specific phenomenon in a real-life context. A case study aims to analyze a case to answer specific questions holistically (Yin, 2003; Gillham, 2000; Tellis, 1997). Case studies are capable of describing, explaining and analyzing data which meets the principles of qualitative research (Yin, 2003). Observation along with multiple alternatives of data collection methods can help yield insight on specific issues from real-life contexts (Gillham, 2000). It should be noted that a limitation of case study is its lack of ability to be generalised to a larger population (Jensen & Rodgers, 2001). The present case study was concerned with one set of class participants from a university in Taiwan.

The theoretical background of this research is a framework of social constructivism in researching and developing students' interactions for critical thinking. There exists within this framework a pedagogical need to de-construct the teacher-authority image in order to create an environment open for student-student dialogues in a 'classroom' setting (either in a face to face or in an online 'classroom' environment) to allow students to verbalise their cognitive processes for critical thinking development. This process was considered as a part of the constructivist approach.

# 3.1 Methodology

## *3.1.1 Action Research*

Action research was the methodology selected for this present study. Kemmis and McTaggart (2005) characterise action research as 'theorizing practice [which] means … [It] is a process of learning, with others, by doing---changing the ways in which we interact in a shared social world' (p. 568). The essence of action research is alternating between reflecting and acting (Freebody, 2003). Originating in the work of Lewin (1946), action research involves a cycle of planning, fact-finding and execution, which is later modified into observation, implementation, reflection, evaluation, planning and modification (Argyris, Putnam, & McLain Smith, 1985; T. Brown & Jones, 2001; Kelly, 1985; Kemmis & McTaggart, 1988; L. Norton, 2001; Oja & Smulyan, 1989; Reason & Bradbury, 2001; Sakadolskis, 2003). Carr and Kemmis (1986) point out the notion of a spiral of cycles involving dynamics of cycles by trying out ideas in practices as a means to improve curriculum, teaching and learning. Action research has the joint objective of action and research, which alternates with each other in cycles (Dick, 1997). Action research is action alternating with critical reflection for the next cycle of action, thus action research has a relationship with the focused notion of critical thinking in this study.

Action research builds on the social constructivist approach underpinning this research. Zuber-Skerritt (1992) defines action research as

> collaborative, critical enquiry by the academics themselves (rather than expert educational researchers) into their own teaching practice, into problems of student learning and into curriculum problems. It is professional development through academic course development, group reflection, action, evaluation and improved practice. (pp.1-2)

This collaborative enquiry by the researcher and the teacher, reflecting on the impact of teaching practice, is a social constructivist element in action research. The social constructivist framework allows teachers to critically examine and evaluate the teaching-learning phenomenon and experience with their personal interpretation in action research. It places both teachers and students at the centre of meaning creation (Zuber-Skerritt, 1992). Day (1999) further depicts it as a model of reflective partnership. Participant action research transforms practitioners' theories and practices as emancipation to empower participants in the local context (Kemmis & McTaggart, 2005). Action research thus interconnects with the social constructivist approach in this research.

According to Brown and Jones (2001), action research also has a de-constructivist perspective in its theoretical duality. Brown and Jones (2001) point out that action research applies the notion of progress as in a modernist approach by changing the past for future action, yet in cycles of self reflection and critique for further modifications, it challenges the existing structure as in a post-modernist approach to empower both students and the researcher teacher. It is what, in an early description, Argyris and Schon (1974) refer to as practitioners' reflection-in-action in the theory of action to monitor one's own practice. The de-constructing reflective mechanism is best illustrated in critically recording as 'teacher-researchers pass through a sequence of perspectives, each capable of generating various types of sequence of writing…subject to reformulations and recontexualizations' (Brown & Jones, 2001, p.8). Applying this reflecting framework into subsequent cycles of action, teacher practitioners have the potential to de-construct the inherent social norms and personal constructs that may impact on how teacher researchers react to a certain circumstance in a specific way.

This study aimed at exploring the intended curriculum, the actual teaching practice, and the resulting learning to ascertain the impact of how students' respond to teachers'

facilitation in the face-to-face and online learning environments for critical thinking. Starting with the action researcher's critical thinking experience, the study also addressed how the teacher's actions would impact on the research participants (students). During the implementation phase/data collection of the study the researcher thus chose to examine their responses so that she could modify the instructional design and the detailed procedure for the next cycle.

*Types of action research.* According to Oja and Smulyan (1989), there are four types of action research modified after Kelly's (1985) action research illustration:

- Teachers act as researchers in action research.
- Researchers trial action projects for their effect.
- Problems are investigated simultaneously in action research context.
- Teachers join collaborative action research with researchers to contribute to educational theory, often in the form of teams and group projects.

This research study used a collaborative action research approach in exploring students' interactions and the critical thinking development. This research study did not emphasise the details of the repeated cycles in planning, observing, reflecting and modifying the teaching practice, because the teacher did not take the researcher's reflection into modifications during the course of data collection, especially in timetabling the integrating of online modes with diverse face-to-face models in class. Instead, the focus was on the procedures in implementing and constantly modifying the models of interactions in face-to-face and online interactions. In addressing teachers' concerns and implementing a recursive process, collaborative action research posed some challenges as researcher and the teacher searched insights into the teaching action in cycles for effective practice and generalising outcomes.

*Challenges in collaborative action research.* There are several challenges in collaborative action research. One of the challenges of action research in social constructivist studies suggested by Lincoln (2001) is the level of involvement in long-term relationship: 'action research mandates that individual researchers commit themselves to a group over some prolonged period of time, time enough to see change through…' (p. 130). In addition, Argyris (1993) found at least three other challenges in collaborative inquiry: interdependence, self-defensive mechanisms and the difficulty of controlling the context.

The following is an illustration of each challenge:

- Interdependence: As the researcher may observe and interpret events differently from the participants due to different past experience, theoretical training and values, it is important to be inter-connected in the research partnership, yet independent as individual subjects at the same time. The issue of interdependence thus needs mutual understanding and frequent communication on what events are critical and how to define the problem point and resolve the problem.
- Self-defensive mechanisms: Participants may respond to the action researcher's suggestions with defensiveness, thus constructive opinions may be taken as personal attacks or threats. There is need for courage to constantly challenge oneself as a practitioner and be strong enough to take criticism and suggestions without being overly compliant.
- Difficulty regarding controlling the context: As situations are context-bound, minimizing the factors involved may not help improvement in the repeated cycle of reflection and re-implementation. A teacher's style may impact students' responses and could be standardised and operationalised for future practitioners (Argyris et al., 1985).

With these considerations in mind, the researcher attempted to establish open

communication patterns that supported the teacher from the initial stage of the action research in order to reach mutual understanding and realise interdependence. The role and the relationship of the researcher and the teacher are defined in the following section.

*The role of the researcher.* In this study, the action researcher took the role of facilitator, and committed to the cycle of change (Kemmis & McTaggart, 2005). The researcher and the teacher are partners in the action that the teacher acts and the researcher offered pedagogical suggestions to assist the next cycle of action (Ladkin, 2004). This model allows the researcher and participants to build up trust and rapport to reveal the 'backstage realities' of their experience not available to the outsider (Paterson, Bottorff, & Hewat, 2003). The researcher attended class sessions, lectures, online discussions and observed students' critical thinking development in face-to-face and online student-student interactions. In the beginning of this research study, the teacher played the major role of teaching in face-to-face classes while the researcher supplemented with pedagogical support and structuring of the online environment. After students participated in online discussions, the researcher played a major role in the online environment and the teacher observed the online interactions. The researcher also reported focus groups and pre-focus-groups results to the teacher as suggestions for modification on curriculum.

The researcher took the role of facilitator carefully as Kemmis and McTaggart (2005) caution the neutrality of the role, which might minimise the social responsibility of the facilitator in assisting change due to different academic theoretical frameworks of the action researcher and university staff. If a suggestion by the researcher concerned a discrepancy, the teacher and the researcher, in collaboration, would decide whether and how to modify the interaction modes. The researcher was cautious about giving

suggestions, which might cause discomfort and misunderstanding to the teacher. Therefore, the researcher kept a record of the noticeable factors that seemed to influence interaction patterns and discussed these with the teacher before, during and after each mode of interaction.

## 3.2 Research Methods for Data Collection

The research study integrated four research methods as primary instruments for data collection: 1) my observations of classroom and online discussion, 2) collaborative inquiry with the teacher in interviews, 3) focus groups designed to elicit students' collective perceptions of the online interactions, and 4) students' online scripts. Comments from, and observations of students who chose not to participate in the research were not recorded in my notes during the class discussion, online discussion, focus group nor survey. The research study was essentially qualitative. However, the study adopted a quantitative style in the presentation of tables and numbers which were deployed as a simple way of contextualising the complex face-to-face and online interactions in the data presentation process. To minimise the effect of the presence of the researcher on students' natural interactions, the researcher hand wrote the observation notes in the focus groups without using either a video camera or an audio recording. Electronic records of the online discussions were stored and utilised for analysis after removing all individual's identification data in order to protect the research subjects' privacy.

### *3.2.1 Implementing Participant Observation*

The first form of data for this study was derived from my participant observation of face-to-face discussions and online discussions. While online research often relies on content analysis (Coffin, Painter, & Hewings, 2005; De Laat & Lally, 2004; Hara, Bonk, &

Angeli, 2000; Henri, 1995; Pilkington, 2001), Mann and Stewart (2000) call for adding context-based data to describe the environment surrounding online participants' behaviour by observation. 'Observational work offers another means to understand the social meanings which are constitutive of and reflected in human behaviour' (Mann & Stewart, 2000, p. 84). This research study chose to implement participant observation in both face-to-face and online environments to better describe the context in which CHC students' real communication emerged in face-to-face real context beyond text-based online data.

Observation is a research method that allows action researchers to understand the impact of the practice for change. Kemmis (1980) summarises Lewin's (1946) goals for action research as:

> Knowledge (theory) about social action could develop from observation of the effects of action in context: simultaneously, social needs and aspirations might be met because action programs were aimed at addressing them directly (as action not as principles which might later be applied in action) (Kemmis, 1980p. 15)

Earlier Spradley (1980) noted that participant observation was the research method used to gather information about social situations covering a broader spectrum of information with an insider' perception gained by engaging in the activities. Paterson, Bottorff, and Hewat (2003) found this offers 'naturalistic investigations of culturally-contextualised social processes' (p.3). Participant observation research assumes that observers' narrations provide a deeper understanding of the issue than participants' self report alone (Paterson et al., 2003). By participating in the social situation, the researcher has access to the meaning and coherence from an insider's views and emotions (Spradley, 1980). The following paragraphs detail the type of participant observation used in the study.

*Types of participant observation.* According to Spradley (1980), there are four types of participation: complete, active, moderate and passive participation. Complete

participation sees the researcher as an ordinary participant in the situation, while active participation seeks a deeper understanding of the cultural rules for behavior beyond obtaining acceptance. Moderate participation, on the other hand, seeks to balance participation and observation as well as the insider / outsider roles. Passive participation merely observes the situation as a spectator. This study deployed active participation observation as the researcher is not a student enrolled in the course, yet desires to obtain an insider's perception of student and teacher interactions for critical thinking. The researcher took the role of an active participant observer who casually attended the group activities to collect observations while attempting to establish contact with the group members (Brown, 2004).

*Challenges of participant observation.* The major concern in participant observation according to Brown (2004) is how natural interactions are encouraged with the presence of the researcher. This has caused an issue of the level of involvement in the participant observation for researchers (Sarantakos, 2005). To construct a non-threatening atmosphere and minimise the impact of the researcher's observation, the researcher chose to sit in a corner of the classroom and not to utilise video camera or audio recorder to record students because of the possible surveillance effect and pressures on students' naturally emergent interactions. To insure the quality of the observation note taking and reduce bias in manually recording what has been observed, I was a participant observer immersing herself in it without intervening in any of the face-to-face activities, but interacted with them after class time. This research chose continuous observation as the time frame to record the entire duration of the face-to-face class time after a three-week warm-up period.

Communicative analysis of interactive and discursive practices is suitable for the purpose of exploring student-teacher and student-student interactions in socially constructed

knowledge formation with a culturally appropriate process (Rojas-Drummond, 2000). According to Sperry and Sperry (2000), communication is a process which involves both verbal and non-verbal channels of information of diverse kinds. McNeill (1987) illustrates it as a process similar to mailing packages back and forth between speakers and listeners with verbal and nonverbal information coding in social and referential contexts. The nonverbal messages include rhythm, pitch, intensity, facial expressions, eye gaze patterns, gestures and other paralinguistic modes of actions (Sperry, 1991), which McNeill (1987) found related to syntactic processing. In view of the importance of nonverbal messages especially in a less verbal cultural context, the current research addressed the problem by immersing I in both the face-to-face and online sessions with the students.

*Models of observation parameters.* The research modified the model of Hara et al. (2000) adapted from Henri (1992) in investigating students' interaction rate, the frequency of participation, the number of cross referencing and patterns online, as well as the cognitive processing within messages. Please refer to Table 2.2 for interaction indicator details. The following is a list of the observation parameters utilized in this study:

- class discussion atmosphere (lively or quiet),
- question-raising and question-answering pattern: pattern of interactions (the interaction chain of cross-referencing one-way or highly interactive in sharing with numerous students commenting on one another's viewpoints)
- students' response to the teacher's facilitation at different stages of discussion ('supporting,' 'facilitating,' 'interpreting,' 'suggesting,' 'limiting the focus' of discussion from irrelevant query, 'consensus taking,' 'linking diverse opinions for problem solving,' 'timing,' and 'evaluating' skills),
- the facial expression, tone, body posture and non-verbal expressions of the speakers and the listeners,

- frequency of individual students' contribution,
- the number of students engaged in the discussion,
- intensity of interactions (mild intonation or vibrant)

The classroom discussion data was analysed with attention to students' overall reaction to the class atmosphere, question-raising and question-answering pattern, students' responses to the teacher's facilitating, the facial expression, tone, body posture, and other non-verbal expressions of the speakers and listeners, as well as the frequency and intensity of students' postings. Please see a sample of observation record in Appendix 1. Online discussion data was examined to see how students crossed from face-to-face interactions to online discussions aiming for critical thinking. See Appendix 2 for a sample of online discussion data and compare it with the face-to-face discussions in Appendix 1 on the same topic. Students' critical thinking was evaluated in the second focus group by the operational definition of critical thinking as described in 2.2.3. The observation data was the major source of data and was checked for trustworthiness with participants. Transcripts were sent to participants through e-mails and printouts in next meeting to ensure verification of the data. The research also deployed cross checking from the various data sources in analyzing and reporting data from focus groups and inquiry with the teacher in order to minimise my bias and the possibility of misinterpretation of the interactions and critical thinking development in the context.

### *3.2.2 Implementing Collaborative Inquiry with the Teacher*

Collaborative inquiry with the teacher formed a second data gathering method. Collaboration is a key characteristic of action research according to Carr and Kemmis (1986). Rapoport (1970) states that action research is situated in an immediate problem by 'joint collaboration within a mutually acceptable ethical framework' (p. 499). The

researcher and the teacher practitioner collaborated with rapport for the goal of improving the quality of the practice. Argyris (1985) notes that the key to success in collaborative inquiry is the creation of an open communication context for both the participant and the researcher to publicly reflect and re-construct the existing patterns of actions.

This research study utilised O'Dowd's (2003) notion of maintaining a reflective journal of students' online interaction pattern. It was my personal record linking class activities with critical events observed in classroom and online environments. As the class discussions took place in face-to-face classroom and online discussion took place partially in a lab, I was present in the immediate and virtual environments at the same time as students were conducting discussion. The journal helped triangulating the observation parameters of face-to-face interactions and collaboration with the teacher. It was used to collaborate with the teacher on a weekly basis in planning, observing, reflecting and attempting to offer suggestions to modify the class activity if the teacher approved of them. See Appendix 3 for an example. In order to avoid conflicts due to different positions in the field as suggested by Cummings and Huster (1986), the researcher and the teacher regularly discussed extra reading texts to be posted on E-course, online discussion questions, and issues concerning interaction models throughout the process through face-to-face meeting, phone conversations and e-mail interactions. See Appendix 4 for a sample of my e-mail communication with the teacher.

### *3.2.3 Implementing Focus Groups*

To explore critical thinking development in student-student and student-teacher interactions, this research utilised focus groups as collectivist narratives of multivocality of participants (Madriz, 2000). Focus groups combine two major techniques for qualitative research: participant observation and individual interviews (Morgan, 1988).

The use of focus groups assists to elicit perceptions, attitudes and opinions by group conversational encounter (Powney & Watts, 1987), which would empower individuals to express freely. Focus groups use the synergy of the group interactions as the integral part of the research process in small, moderated groups for purpose of understanding and interpreting group members' experience (Wilson, 1997). Individual interviews have been criticised as questioner-dominating, and not leading to true feelings of the respondents. Focus groups allow the synergy of multiple respondents' interacting with thoughts in a comfortable setting for self-disclosure not to achieve consensus, but to explore various perspectives (Anderson, 1990). Researchers may never know the answers otherwise in an individual interview, but participants will elaborate and defend viewpoints with their peers (Wilson, 1997). This sharing in focus groups creates socially constructed experiences which Denzin (1989) refers to as interpretive interactionism.

*Challenges of focus groups.* One of the disadvantages of focus groups is the fact that they are conducted out of the context where social interactions normally take place. This may limit the variety of behavioral information to self-reported data, verbal communication and body language (Madriz, 2000). With the participant observation in the classroom and online discussion, this disadvantage was minimised by the information students revealed in interacting in a natural classroom context and in online discussion forum. The second shortcoming is the influence of the presence of the facilitator, which may impact on participants' expression of particular voices and feelings (Fontana & Frey, 1994; Sveningsson, 2004). As the facilitator-researcher was not the teacher of the class and decided to take the role as co-listener and to view participants as consultants as suggested by Wilson (1997), the impact of the facilitator was reduced to some extent.

*Strategies of successful focus groups*. The key to success in focus groups includes the way facilitators plan and moderate the discussion, as well as the group composition

which contains a motivating power for participants to focus on the issue (Anderson, 1990). As Madriz (2000) found the challenge of focus groups is to elicit answers from those who have been socialised to reserve their opinion and not to disagree with others. Thus, the timing and context need consideration to avoid uneasy feelings about stating the truth (Morgan, 1998).

To sum up, the reason to use group discussion about students' online discussion is two-fold to take advantage of group dynamics and to increase students' awareness of their own meta-thinking (Madriz, 2000). To better prepare focus group questions, a pre-first-focus group was conducted with the earliest online participant (See Appendix 5 for questions used in this focus interview). The timing of the focus groups considered the limits stated above and was chosen during the time when the teacher was not in town. The first time to conduct focus group was week eleven, the week after implementing synchronous and asynchronous online discussion (See Appendix 6 for more details). A pre-second-focus-group was conducted (Refer to Appendix 7) to screen the questions of interest. The second focus group was implemented in week fifteen to conclude the factors impacting face-to-face and online discussions (Appendix 8). After discussing participant observation, collaborative inquiry with the teacher and focus groups as research methods used in this research, the thesis now progresses to describing the research design.

## 3.3. Research Design

### *3.3.1 Research Setting*

The research was situated in the only foreign language college in Taiwan. English is the instruction language in most English courses on campus. This is a rare feature in Taiwan.

This Catholic foreign language college aims at developing students' holistic perspective of themselves and knowledge of English language and a second foreign language (Japanese, French, Spanish or German) to cultivate global citisens capable of communicating fluently in two foreign languages. Thus, the mission of the school is congruent with the focus of this research on English communication capability and critical thinking in a global context. The college has several divisions. It operates several programs including a five-year junior college program and a two-year college program. Participants in this study were drawn from the two-year college program, which by graduation will offer the degree of Bachelor of Arts in English.

### *3.3.2 Research Participants*

This research focused on critical thinking in a third-year university course 'Professional English Reading'. The research participants were equivalent two-year qualified with an Associate degree and were newly enrolled in the two-year Bachelor of Arts program of the English department. Their ages ranged from 20 to 23. They came from three types of backgrounds: a) alumni of the English department from this college with previous five year language training, b) alumni of non-English department from this college with previous five year language training, and c) non- alumni with five years vocational training elsewhere. There were different levels of English between them, yet the majority of them were presumed to be intermediate-advanced learners of EFL, thus having the capability of understanding verbalised critical thinking.

All participants in the online discussions were given pseudonyms to protect their privacy. In keeping with the idea of metaphor noted in chapter two, each student was given the metaphorical name of a plant as a new identity behind the online veil. As the image of the shepherd was used to describe the teachers' role of facilitator in preparing students in the

face-to-face environment for the online interactions, the image of the garden was used to describe the online environment and phases, which were developed in the online discussions: budding, blossoming and fruiting. Each participant was like a plant/ fruit tree whose leaves grow and who bear fruits in season as said by a psalmist,

> 'He is like a tree planted by streams of water, which yields its fruit in season and whose leaf does not wither' (Psalm 1: 3).

The description of each participant being planted by streams of water indicates the fact that in the online teaching-learning environment, students were not left without support, but rather were provided with continuous cognitive support and input from the teacher. In addition, the teacher also provided cognitive challenges to help students' critical thinking development. Another example of the gardener as metaphor illustrates this challenge as pruning:

'I am the true vine and my Father is the gardener…he prunes every branch that does bear fruit so that it will be even more fruitful (John 15: 1-3)

The following is a brief profile of each of the major online participants from the eight small groups in face-to-face learning environment who have particular contribution to the critical thinking development in this research study:

Daffodil was one of the most active students in the research class who dared to ask the teacher a logistic question in face-to-face environment. She posted the first message online in the semester and contributed to most discussions early. She was the leader of group eight.

Sunflower was an outspoken senior student who was retaking the course. Unlike most of

the research class students, she was not bound by the CHC harmony principle because this was her only repeat subject. As she did not need to meet the others in other required courses, she was not considered by either the class or herself as a class member. She constantly challenged others, even I. She was the leader of group five.

Palm held strong opinions, but was usually quiet in the face-to-face environment except within small group discussions. He made only one contribution online, yet as will be seen in chapter 4, it was an important one. He was a member of group three.

Eucalyptus was one of the earliest participants and the online leader of group three. However, she was not a confident speaker in a face-to-face environment because there was a talkative student in the group.

Cinnamon was the talkative face-to-face leader in group three. She was not as active online because she perceived it was not as efficient as the face-to-face environment.

Rose was a quiet student from group seven, a very quiet group without much dynamic in face-to-face discussions. After my e-mail of encouragement, she broke her silence very late and became the most verbal student online.

Margarita was a typical 'good' student under CHC context. She was volunteered by her group as a face-to-face class debater and always gave classmates support messages especially after online challenges.

Lavender, calling herself 'silent girl,' broke the silence lasting more than two weeks in discussion two. She continued to participate in discussions with my face-to-face verbal encouragement. She was the leader in the quiet group seven.

Macadamia was one of the three early participants in the online discussions. She was the

leader in group four and influenced other members' online participation through synchronous real time chats.

Lily was a challenger from the other class that the teacher taught. Lily felt no need to abide the CHC harmony principle in inter-class environment. She challenged students from the research class.

These participants contributed to the majority of the online discussions and impacted the boundary of interactions for critical thinking in this research. The next session explains the procedure implemented in this research.

### *3.3.3 Modified Research Procedure*

The research procedure started with students' required reading prior to the class on two articles on the issues of the week selected by the teacher as the cognitive input. To maximise the opportunities for critical thinking, I set the foundation of all class interactions as cognitive input of knowledge and comprehension, while cognitive processing of analysis and cognitive output of evaluation as the goal of the class interactions (Stoner, 1997). Browsing online is a text-student relationship and the base of cognitive input (Jonassen, 2001). During the first hour of the three hour face-to-face class session from week five onwards, the teacher modified the pedagogy from not lecturing at all to presenting key phrases, concepts, background knowledge and finally announcing the discussion questions for small groups (after a complaint from the students) This is further noted in chapter 5.. In the initial sessions eight small groups consisting of five or six persons first discussed face-to-face within groups, the teacher's questions for each article and prepared a summary in the second hour.

In the third hour, the teacher drew lots to call on groups to present their group responses and summary to the class. I observed the group and class dynamics in the back of the classroom to examine what factors influence students' critical participation in the discussion. The closely observed small groups were selected based on the criteria that the constituents of a group revealed a good mixture of students of different types: highly verbal ones (who volunteered to lead), medium verbal ones (who replied at request), and quiet ones (who hardly ever spoke in class). Two groups of the ideal composite had one more verbal student, two medium verbal ones and two quieter ones. Three groups were of all quiet ones, but there were two online leaders who emerged from two quiet groups and subsequently changed the online dynamics.

Online browsing and interactions were implemented in a public computer lab in the first hour from week 10 onwards. Before week 10, students were allowed to take shifts to browse for twenty minutes at request during the first hour. They either used search engines or accessed the hyperlinks selected by I on the campus platform E-course learning management system. Through students' suggestions in week eight, the teacher approved giving extra marks for online participation in week ten.

E-course is a system utilised by the school since 2002, which encompasses course introduction, course content, a course bulletin board, a homework posting system, synchronous small group discussion, asynchronous forums of online discussion and grading management in one single system. It was utilised by several national universities in Taiwan. At the year of the research period in 2004, it was voluntary for teachers to use the E-course system.

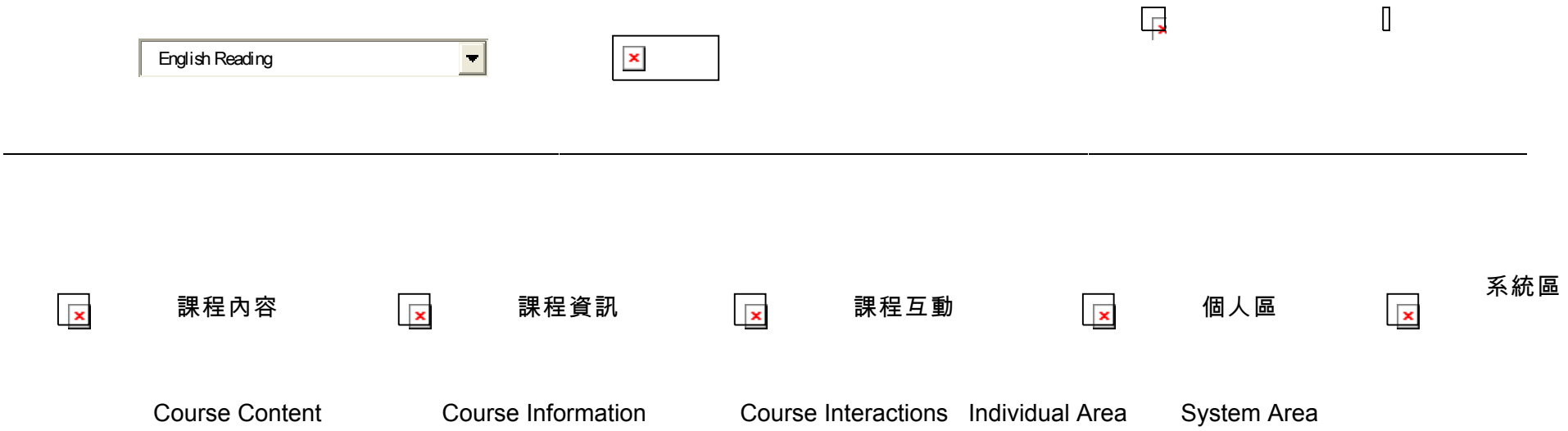
This section details the procedures for using the E-course system. Online participants needed to first login into the E-course system with their school number and a self-selected

password which was the same as their school e-mail account. On the homepage of E-course, Q-A sections were provided about forgetting the passwords and other technical support to help students clear up login problems. After login, students would see a list of the e-courses their teachers uploaded online and they would need to select the research course. The following is a figure illustrating the functionality of the E-course after login into the course 'English Reading'.

The online participants then needed to choose the 'Course Interactions' bolded above to help readers to notice its location. Upon clicking this button, there will be different modes of interactions: course bulletin board, real time chat, small group real time chat, issue discussion, e-mail teaching assistant and survey. Then, online participants needed to click 'Issue Discussion', in *italic*, to see the interface of the seven online discussions. The Issue Discussion interface includes the seven discussion topics, start dates and closure of each discussion with the number of the messages posted by the day of browsing as an update. The starting dates were the day students were allowed to post messages, usually days earlier than the face-to-face class sessions on an issue to provide cognitive input on extra hyperlinks of materials in addition to the hard copies of two articles provided by the teacher in the beginning of the semester. Figure 3.1 represents the Functionality of the E-course. Figure 3.2 shows a sample of the 'Issue Topics for Online Discussion'.

Figure 3.1

Presentation of the Functionality of the E-course Interface



After clicking into '**Course Interactions**,' the following interface will appear on the screen with four options of interactions. For small group real time chat, click '**Synchronous small group chat'**. For class discussion on the seven topics, click '**Asynchronous Issue Discussion**.'

Figure 3.2

Issue Topics for Online Discussions

Issue Discussion

| | Enter | Issues | Start | Closure | No. of update Today |
|---|---|---|---|---|---|
| 1 | | Betelnut Beauties: what problem? | 2004-10-18 | 2004-11-15 | 0 |
| 2 | | Taiwan value | 2004-11-01 | 2004-12-10 | 0 |
| 3 | | Foreign Minister's Incident | 2004-11-22 | 2004-11-29 | 0 |
| 4 | | Madame Chiang Kai-shek | 2004-11-29 | 2004-12-06 | 0 |
| 5 | | Weapon purchase | 2004-12-06 | 2005-01-03 | 0 |
| 6 | | First Lady of Taiwan | 2004-12-10 | 2005-01-03 | 0 |
| 7 | | Lee Teng-hui in Japan | 2005-01-01 | 2005-01-10 | 0 |

Except for discussions three and four, which were designed for one week length for synchronous mode and online homework trials, all the other discussions were originally set for two weeks and extended at students' request based on interest and intensity of discussions. The results of, and factors influencing online participation in each discussion will be discussed in chapter four.

The entire class online session during class hours started in the first hour of week ten. After browsing, each small group discussed the questions announced by the teacher in the classroom in the second hour. In the third hour, the teacher announced whether the presenting groups were selected by drawing lots or the class had a debate. I recruited all groups to post their group responses to the discussion area in the initial stage. Volunteer students reflected different views and contributed on the E-course asynchronous discussion forum in issue discussion after school since week five on. Based on the reading topics, I selected the online discussion topics and framed questions from the teacher's existing syllabus (See Appendix 9).

The seven online discussion topics were chosen from the required reading topics of the week. They were all current issues reported and discussed in local media. For example, the two required reading topics for week five were *Tourism in Taiwan* and *Betelnut Beauties* and the latter was chosen due to its controversial nature which better suited discussion. Table 3.1 provides further explanation of a number of the topics for discussion.

Table 3.1

An Explanation of Some of the Online Discussion Topics

| Discussion Topics | Explanation |
|---|---|
| 1.Betelnut Beauties | A social phenomenon of young females dressing scantily in street stands to attract motorists to stop and buy betelnuts |
| 2. Taiwan value | A debate on whether Taiwanese value environment over economy in earthquake rebuilding plan |
| 3. Foreign minister's LP incident | An incident of Taiwan's foreign minister using grass root lexicon in dialect implying male's organ in response to Singapore's criticism of Taiwan in U.N. |
| 4. Madame Chiang Kai-shek | Perception on the most influential woman in the history of Republic of China |
| 5. Weapon purchase | Election issue on whether the country should buy 600 billion weapons from the U.S. at the threat of communist China |
| 6. First Lady of Taiwan | Incumbent president Chen's wife's attendance in Paralympics, downgraded at China's pressure |
| 7. Lee Teng-hui in Japan | Former president Lee's visit of his alma mater in Japan, blocked by China |

Students participated in these online discussion topics and influenced others to participate in the online community. Modes of interactions evolved from the different interaction patterns in face-to-face and online learning environments. The following section will illustrate different modes of interactions.

### *3.3.4 Research Models of Interactions*

As the study aimed to explore diverse interaction models produced by different communication modes, the face-to-face models of interactions and online modes of interactions were important in this research in fostering students' verbalising critical thinking. The teacher and researcher developed two new models of face-to-face models of interactions during of the action research cycle to modify the model implemented: group-supported class debate model and semi-class debate model. There is no literature supported, but the result of different models will be discussed in chapter five. The modes of interactions in online environment included synchronous and asynchronous online discussions. The following table illustrates the various models of interaction which were used in the study. To differentiate between online and face-to-face environments, I called face-to-face 'models' and online 'modes' in this study.

Table 3.2

Models of Interaction

| Models of Interaction | Face-to-face | Synchronous | Asynchronous |
|---|---|---|---|
| Small group Discussions | • | • | |
| Group Presentation | • | | |
| Class Discussions | | | • |
| Class Debates | • | | |
| Group-supported class debates | • | | |
| Semi-class Debates | • | | |
| Inter-Class Discussions | | | • |

The following is the brief explanation of each model of interaction:

- Face-to-face small group discussion: a model of face-to-face student-student small group discussion that involves all to clear problem points (Chiu, 2002; Frank & Davie,

2001)

- Face-to-face group presentation: a model of presenting small group discussion results in class, involving only presenters selected by the teacher
- Face-to-face class debate: a model of debate by six students without group support
- Face-to-face group-supported debate: a model of debate by six groups who seated beside those six debaters for immediate support
- Semi-class debate: a model of modified class debate in which all eight groups of students were involved to present and comment on another group
- Synchronous small group discussion: an online mode of real-time student-student interactions within small groups (Kung, 2003a; Sotillo, 2000).
- Asynchronous class discussion: an online mode of entire class student-student interactions with time delay (Bullen, 1997; Hara et al., 2000).
- Asynchronous inter-class discussion: an online mode which invited other online participants who were not members of the face-to-face research class.

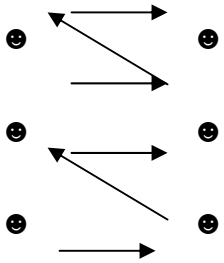
The research underwent some modified procedures and three types of face-to-face debates were developed according to students' feedback.

*The Debates*

One traditional mode of interaction in the face-to-face environment is the class debate which usually involves six students. In this study, the class was divided into two sides. Comprising the 47 students in the class, eight groups of students drew lots to choose sides and the six debaters. In the following graph, ☻ represents the debaters, and the arrows represent the process and direction of challenge and reply which was used in the debate.

Figure 3.3

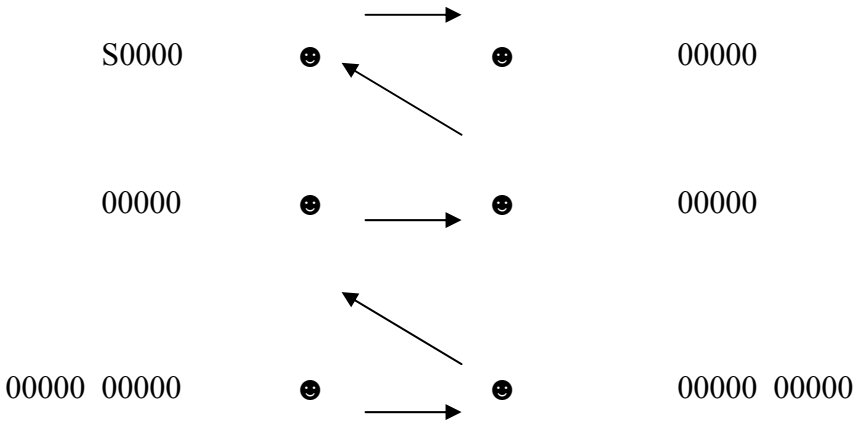
Class Debate Model by Six Debaters



The second model of group-supported debate was a modified mode of the traditional class debate. To compensate for the lack of participation and support from the class which occurred in the first model, the second model attempted to provide more affective and cognitive support to lessen pressure on the 'lucky presenters'. (As no one wants to debate in a CHC culture, the debaters are usually thought of as unlucky. In this case they were considered, by the researcher at least, as lucky.) The teacher designed the task so that the six debaters were drawn by random numbering and group mates sat right behind the debaters for immediate student-student affective and cognitive support. The following Figure (Figure 3.4) was the configuration of the seats in which each ☻ designates the debater as the representative of each group, and 0 represents the think-tank group members supporting the debater:

Figure 3.4

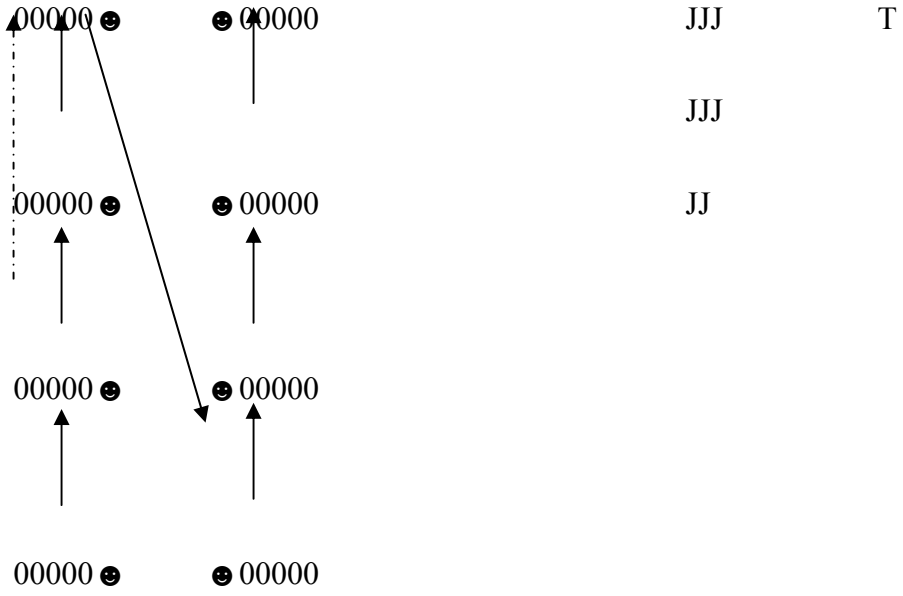
Group-Supported Class Debate Model




While group-supported debate improved the social constructivist group interactions, not all eight groups participated in the activity in the group-supported class debate model.

To allow all groups an equal voice, the next model was a semi-debate mode participated in by all eight groups. Two facets differed from the debate by six groupings. Judges were delegated and the participation from all the eight groups was increased. The teacher randomly selected presenters who argued for their opinions and offered criticism to the previous group. Each group also sent one member as judge. The teacher planned this to foster student-student interactions in a three-fold way: interacting within the groups, among all the group presenters, and between the student judges with the group presenters. The following figure (Figure 3.5) represents the model of semi-debate by all eight groups with group judges (J):

Figure 3. 5
Semi-Debate Model by all eight groups




### *3.3.5 Research Procedures*

The research procedure involved trying out each research model, and as action research, it had numerous modifications in full implementation, observation and reflection. The following table (Table 3.3) lists the activities during the data collection and the correspondent timetable. It activated the different models and modes for different discussion topics:

Table 3.3

Data Collection Timetable

| Week | Procedure |
|---|---|
| 1-3 | Warm-up by teacher<br>Face-to-face group presentation on summary |
| 4 | Week 4:<br>●Consent forms collected & Participant Observation started<br>●Face-to-face small group discussion, group presentation |
| 5/6 | Week 5:<br>●Teacher's presentation, Face-to-face small group discussion, group presentation, after class asynchronous discussion on 1st Online Discussion on Betelnut Beauties<br>Week 6:<br>●Face-to-face small group discussion, group presentation on issues not selected as online discussion topics<br>●2nd Online Discussion Question posted on 'Taiwan value' |
| 7/8 | Week 7: Class guided to a speech by the teacher<br>Week 8: Teacher out of town, no class (researcher went in class to encourage students to participate online for 'Taiwan value') |
| 9 | Week 9:<br>●Browsing (50 min), Small Group Discussion (50 min), 1st Class Debate by six on Taiwan value (50 min), after class asynchronous discussion<br>●Posting 3rd Online Discussion on LP in advance |
| 10/11 | Week 10:<br>●Browsing on LP (40 min), Synchronous Discussion in Small Groups (10 min), Small Group Discussion (50 min), Group Presentation on LP incident (50 min), Asynchronous class discussion after class<br>• Group Reflection Sheet on interaction modes<br>• Posting 4th Online Discussion on Mm Chiang Kai-shek in advance<br>Week 11:<br>No Class, 800-word summary to be uploaded in E-course by the research class and the non-research class<br>●Posting 5th Online Discussion on Weapon Purchase in advance<br>●[*Focus group 1 on Nov 29 with early online authors]* |
| 12/13 | Week 12:<br>●Browsing on Weapon Purchase, (one group real time chat), Small group Discussion, Class Debate by six groups,<br>●Inter-Class asynchronous discussion on Weapon Purchase |

| | |
|---|---|
| | ●Posting 6th Online Discussion on 1st Lady in advance<br>Week 13:<br>●Browsing on 1st Lady, Small group Discussion, Semi-Debate by eight groups,<br>●Inter-Class asynchronous discussion on 6th Online discussion on 1st Lady |
| 14/15 | Week 14: Class Off for Campus Fair<br>●Cont. Asynchronous discussion 6th Online Discussion<br>●Pre-Focus-Group 2 Interview with online members<br>Week 15: Movie time for 1st Lady<br>●Researcher's retreat from face-to-face class<br>●*[Focus group 2 on Dec 30]* |
| 16/17 | Week 16: Trial Online Discussion on Ex. President Lee |

As shown in the timetable above, the first three weeks were orientation sessions for warm-up time for the teacher alone with the research class. A synchronous mode was utilised in full class only once in week 10, and was voluntarily used by one group twice more and by a second group once more. Each of the eight face-to-face small groups was given Group Reflection on interaction modes and models (See Appendix 5) after the in-class synchronous discussion in week 10.

The first focus group was implemented in week 11 (See Appendix 6). An individual interview was conducted in week 13 (See Appendix 7) prior to the second focus group to check the feasibility of questions in focus group two. The second focus group was implemented in week 15 (See Appendix 8). The following section discusses modifications made to the program by the teacher and suggestions following the two focus groups. These are in keeping with the reflection- change cycle of action research.

## 3.4. Modifications

There were modifications caused by the change of teacher on the research design of this study. (The original teacher was unable to be apart of the study – at short notice. A new teacher was engaged just prior to the commencement of data collection.) While being of Chinese heritage, the teacher's background was different to that of the Taiwanese research

participants.

### *3.4.1 Shift of Teacher and Class*

The teacher who originally agreed to participate in this research was unable to open the course 'Online Forum of Current Issues' at the time of data collection. Due to the sudden unavailability of the research context, I had to seek another teacher who had a critical thinking focus in the course to launch this study two weeks before the semester began. The teacher sought was a senior professor in the International Affairs department who has just retired from Hong Kong after 30-yearsof teaching there. Hong Kong is a different cultural context from the local research context.

*Teacher's Background*. With her PhD. obtained at the London Institute of Politics and Economics, the teacher's British training in political science and debates suited the purpose of critical thinking on current issues in this research. Her educational philosophy concurred with the social constructivist theory that both teacher and students acquired from the learning process. The teacher was fluent in English and Cantonese dialect, yet not the official language of Mandarin, nor in the local Taiwanese dialect. She had western training in critical thinking in English and her emphasis on debates was from political science.

*Course evaluation.* As an advanced reading class, the examination on reading was the most important part of grading in this course. The course evaluation criteria (See Appendix 9) included 40% on final examination, 30% on individual reading reports on Taiwan value and Madame Chiang Kai-shek, 15% on group presentation, and 15% on class attendance and participation. Group presentation and discussion were to be conducted in class. Full participation in classroom activities was expected and 75% of class attendance was the minimum. As online participation was entirely voluntary, it was not counted into the course evaluation.

*Course Objectives and requirements*. The goal of this reading course combined the advancement of both reading and critical thinking: The objectives were:

- Enhancement of the skill of comprehension and reading in context

- Encouragement of students questioning accepted norms, views and myths
- Exploring the width and depth of thoughts and expression stimulated by reading

The course description stated in the course syllabus (See Appendix 9) was critical reading and discussion on news articles on a wide spectrum of issues of Taiwan including college life, arts, cross-strait relation with Communist China, weapon purchase, etc… I chose six more controversial issues from the existing syllabus and added one more into the online discussions.

The course requirement was to preview assigned materials before the class. The reading articles were printed out in hard copies for all students. They could also access these through the school library electronic database of Pro-Quest, and Lexis-Nexis, which was preferred by the teacher to the online posting of hyperlinks from the E-course. This also caused several changes in the research study. The following section presents the consequences of the shift of the teacher.

### *3.4.2 Technical Issues*

I offered technical and administrative assistance in hardware and software application. The hardware required computer lab reservations and contacts with the Curriculum Section at the Academic Office. On the other hand, the usage of software, the campus online platform E-course, required filling out online application forms to the Computing Center before a class could be officially registered on the campus online platform, E-course. After all the technical preparation of setup, the teacher attended a pre-scheduled three-hour weekend workshop for E-course novice users. Finally, students had authorised access to the class site on E-course. They could switch login names from school numbers to their selected names. The teacher did not know how to use the system. Thus I still needed to help the teacher to login to the class website in the E-course and operate different functions, including setting homework assignments, class asynchronous discussions on topics assigned by the teacher, and the class bulletin board for non-content-related issues.

*Change of in-class online discussion schedule.* Unlike in collaborative action research, the teacher decided not to have in-class online discussions until week ten and to omit the web-based option for the second half of the semester. The major change resulted in implementing after class online discussion as an extra activity for students. This led to motivational and access issues. The voluntary type of participation only included highly motivated and committed students. Nevertheless, the three-hour face-to-face classroom sessions with occasional browsing before week ten provided sufficient time and basis for the entire class to be familiar with small group face-to-face discussion in EFL class of CHC context. This technical preparation slowed down the beginning of the study approximately two to three weeks and pointed my awareness to the technical and pedagogical support needed for online teaching novices.

### *3.4.3 Pedagogical Issues*

In addition to the technical support needed, pedagogical support was needed in EFL class interactions and the research design of the study accommodated this factor.

*Gap of EFL and content knowledge in classroom*. The teacher's lack of previous EFL training prior to this study led to her inability to predict students' problem points in English vocabulary and thinking system. As students' English language exposure and the non-debating culture of Taiwan were different from the teacher's previous experience in Hong Kong, she needed pedagogical support in teaching procedure and key phrase presentation. The need for EFL awareness took the teacher some transition period to modify her way of explaining in English to help students' mental transfer in processing thoughts in English.

*Pedagogical change*. Other changes included the teacher's change of pedagogical decisions, change of accepted online discussion questions and the use of a public online lab not reserved for the research class. The teacher selectively modified the methods in face-to-face discussions from my suggestions based on face-to-face observation, online discussion analysis and focus groups. The data collection process was changed several times, yet the unexpected data collected from the face-to-face and online interactions added

richness to this study. The next part will introduce the ways data was analyzed in this research study.

## 3.5 Data Analysis

Walford (2001) defines data collection and analysis as the actions which simplify and focus the research on how to situate the phenomenon. The analysis frame of this research study was derived from a shepherd metaphor within a CHC context. The primary characteristics of CHC are silence in public and a non-confrontational communication pattern within groups. Hence, this research study focused on describing the nuances of online interactions related to online agreement, silences and disagreement within groups, between groups, as well as between the research class and the non-research class. Scardamalia (2004) and Scardamalia and Bereiter (1994) suggest analysing discourse for definition and clarification of knowledge-building, including the creation of a climate and desire for a knowledge building community. This study applied these ideas in the context of a CHC learning environment. As silence is common in the CHC context, it is important to differentiate silences and discourse related to them to better help students. The following is a brief introduction of the analysis frames in this research study:

- Inter-group Agreement: messages explicitly agreeing with a member from another group of the class in the face-to-face environment
- Inter-group Disagreement: messages explicitly disagreeing with a member from another group of the face-to-face class
- Intra-group Disagreement: messages explicitly disagreeing with a member of the same group in the face-to-face environment
- Intra-group Agreement: messages explicitly agreeing with a member of the same group in the face-to-face environment
- Inter-class Disagreement: messages explicitly disagreeing with a member of another class
- Group-chained Interactions: messages without explicit agreeing or disagreeing statements, yet replying to a member of the same group
- Challenging teacher: messages that challenge the teacher

- No-idea silence: the type of silence online without full comprehension of the discussion question shown in total silence or students' query of the meaning of the question as the response
- Germinating silence: the silence during the time of cognitive process, which could lead to postings, observable later
- Conflict-avoiding silence: the type of silence following others' conflicts or one's own conflict with another member
- Interposing: messages replying to a much earlier issue after 'conflict-avoiding silence'
- Monologues: messages that did not aim to elicit response by merely replying to the starter question as required without revisiting

The analysis frames above were designed to better illustrate the subtleties of different communicating patterns due to cultural influence in the online interactions. Since public disagreement is not a social norm in CHC classrooms, different forms of presentation of disagreement including challenge, confrontation and even flaming were expected. I informed students about the accepted norm of respecting others and presenting different opinions with supporting evidence in online discussions, yet students did not have prior experience in verbalising different opinions. Thus the interaction may result in diverse forms of disagreement.

This research was conceptualised as an inverted pyramid with observational data at the base, with focus groups and collaborative inquiry with teacher at two sides. This revealed the interwoven interpretation of the student-teacher and student-student interactions in class, online and in focus groups.

In utilising a social constructivist approach, this research situated action research in collaborative inquiry. Participant observation (Spradley, 1980) in the online context served as the base of the primary data, and was supplemented and completed with students' subjective collective interpretation expressed in focus groups and teacher's peer check. The research study utilised an analysis parameter similar to Hara et al. (2000) on students' participation rate, cross-referencing and interaction patterns. Additional parameters of

facilitator's techniques were from Kao and Chen (2003). Critical thinking development was analyzed and compared for development patterns in different modes and in different stages of the course.

Walford (2001) also emphasises investigating all data by 'systematic work with the data conducted throughout the data analysis to ensure that all data are covered by the theory and that, where there are oddities, these are investigated in full' (p. 189). If there was discrepancy of information found among different sources of data, I sought to re-confirm with student participants during the research period in the focus groups and after the research period through e-mails.

## 3.6 Trustworthiness

While reliability and validity have usually been associated with measurement in the quantitative paradigm (Patton, 2002), within the qualitative research paradigm, Denzin and Lincoln (2005) illustrate the notion of 'trustworthiness' as one of the criteria in evaluating qualitative inquiry in constructivist research studies (p. 24). Patton (2002) further covers trustworthiness as an important social constructivist criterion, along with triangulation, authenticity, and reflexivity in analyzing contributions to dialogue. In an earlier work by Guba and Lincoln (1994), 'trustworthiness' refers to the truthfulness of the explanation of research process and how each decision is made in the data collection process, which could be achieved by improving credibility and transferability. Credibility could be reached by peer discussion, collecting negative case for analysis, referential analysis and checking of members, while transferability could be achieved by checking interviewees' subjective expressions of experience to deepen the thickness of description in context and interpretation (Guba & Lincoln, 1994).

The current research utilised the paradigm as described by Denzin and Lincoln (2005) in data analysis. As Hu and Yao (2002) propose that qualitative research does not seek a singular universalistic law which has been derived from a positivistic paradigm, this research study attempted to increase credibility by carefully designing the research setting, carefully taking field notes and using multiple sources of data in face-to-face and online discussion. My observation data was the major source of data to be cross checked for

validity against bias by the triangulation method: with students, with students' online discussion, through the use of focus groups, and with the teacher. First of all, I checked my observation notes with students who had verbalised critical thinking through after class conversations, lady's room talk, dialogues on E-course real time chat, and individual e-mails. Secondly, I cross-examined my observation results with students' online discussions in my reflective journal. Thirdly, I checked my reflective journal with the teacher on a weekly basis to inquire about the reading texts, discussion topics, face-to-face models of discussion, focus group results, students' face-to-face interactions and online interactions. We met in her office, talked on the phone or had e-mail communication at least once a week before the class time on Wednesday as shown in Appendix 4. Fourthly, I e-mailed all focus group participants the transcripts of the focus group discussions within three days and verified with them in the next class meeting time. I handed the summary of all findings to students who did not respond in e-mails for checking trustworthiness (Patton, 2002). In short, observation, focus groups, analysis of online discussion and collaborative inquiry with teacher were crossed checked to minimise selective reception and misinterpretation of the interactions.

## 3.7 Ethical considerations

While aiming to bridge the gap between the critical thinking concepts and actual pedagogical guidelines in CHC context, the study attempted to minimise ethical problems (Sarantakos, 2005), especially in online context (Forte, 2004; Peden & Flashinski, 2004; Sveningsson, 2004). Sveningsson (2004) suggests that the online have different research ethics policies, while Sveningsson, Lovheim, & Bergquist, (2003)found most online researchers consider it impossible to completely avoid my influence over the research respondents. Some of the ten commandments on ethics by Sarantakos (2005) include consideration of a person showing discomfort, using techniques with questionable degree of safety, causing respondents' physical or mental stress and violating professional research standards. According to British Psychological Society (2002), 'Code of conduct, ethical principles and guidelines' suggest researchers not 'intruding upon the privacy of individuals who, even while in a normally public space, may believe they are unobserved' (Sect. 9.1).

The ethics was carried out by the following considerations in this research study. First of all, this research was of voluntary nature and volunteering students read the information letters and signed up the consent forms (See Appendix 10). Also, I was not the teacher of the class, so students who did not wish to participate in the study were under no obligation to do so. Focus groups were conducted with voluntary participants without the presence of the teacher. This was particularly important in CHC classroom. In addition, all the personal information in the online postings was removed. While students may switch their E-course login names and hide school number to pen names (such as Lavender as 'silent girl), students were coded to avoid personal identification in the data analysis process. Moreover, the gradual model of allowing the use of native tongue and progressing into English was designed to gently help students to better adjust to the open discussion forum in Internet-mediated learning context. This study had approval from the ACU National Committee for Ethics in Human Research (Approval number: V2003.04-08). The following chapters report the findings and analysis of the data collected through face-to-face and online interactions.

# CHAPTER 4

# FINDINGS

*An Online Community is: "A system where people figure out where the conversation is going, by themselves, and settle conflicts among themselves" (Rheingold, 1998, p. 1).*

This chapter addresses the data of the face-to-face and online interactions collected through the methods mentioned in the previous chapter. The first two parts of this chapter aim to answer the overriding research question about the impact of student and teacher interactions on critical thinking in face-to-face and online environments. The third part will correlate with the sub research question about the characteristics and role of a facilitator and the fourth part responds to the research question concerning models of interactions. Analysis was based on the data collected from focus groups, collaborative inquiry with the teacher and my participant observation, and analysis of students' online discussions. In order to better respond to the major research question on student and teacher's face-to-face and online interactions, section 4.1 (Seven Online Discussion Episodes) introduces students' interactions during seven online discussions. Teacher's support prior to each discussion was included to help answer the first sub-research question on the role of a facilitator. Section 4.2 (Students' Critical Thinking Development) correlates the findings with critical thinking to supplement the major research question. Section 4.3 Models of Interactions responds to the second sub-research question concerning face-to-face models and online modes of interactions. Section 4.4 concludes this chapter of findings.

## 4.1 Seven Online Discussion Episodes

The seven online discussion episodes were derived from the teacher's existing curriculum design (Please refer to Appendix 9). They were divided into three phases for the particular

needs in fostering CHC students' verbalised critical thinking in an open atmosphere transferring between face-to-face and online discussions in different phases. This section will provide information on how the researcher supported the teacher in preparing students for verbalising critical thinking and facilitated students' interactions in face-to-face and online environments. As mentioned in chapter three, the metaphor of nurturing a garden was utilised in analyzing and presenting the online interactions. The three phases were budding, blossoming and fruiting. The first phase of the study was subtitled: building relationship.

### *4.1.1 The Phase of Budding: Building Relationships*

The first of the online discussions was designed to allow students to become familiar with, and comfortable in, the online environment. It was the warming up stage used to cultivate the student-student and student-teacher interactions in an oral form of face-to-face environment moving gradually towards an online environment. The metaphorical description of this interaction might be called 'budding'. The first phase of the study intended to bridge the cultural and technical gaps. It was the 'let-being' period which aimed to create a supportive environment for the emergent interactions. Affective, cognitive, technical and pedagogical preparation was needed to help minimise the teacher's authority and maximise the online environment to make the 'budding' possible. Students in CHC normally would not take the risk of voluntarily expressing their opinions in public. Coupled with the need to discuss controversial issues, most of the students observed for a while and hesitated in whether they would take a 'leap of faith' for self-exposure in an online forum.

In view of the ice-breaking difficulty of launching an online discussion with the teacher's reservations about online learning, I had to create an atmosphere as friendly as possible to increase the motivation and participation rate. I chose the interesting social phenomenon of betelnut beauties from the teacher's existing reading curriculum. This issue was presented in the local electronic media for the past years and would motivate local students with interest and familiarity. Meanwhile, I actively built up the affective domain of relationships taking the role of a facilitator in the face-to-face learning environment and an online critical friend in three-hour weekly class time.

*First episode: Beltelnut beauties.* The discussion on beltelnut beauties was a successful try-out episode to break through the silence and cultural wall presented by the CHC culture. The phrase 'beltelnut beauties' (檳榔西施) is pronounced as 'Bing-lang shi-shu' in Chinese language. The first part 'Bing-lang' (Beltelnut or 檳榔) are green nuts called by some as the 'Taiwanese chewing gum' producing spicy taste with red liquid often spat on ground after consumption. The second part 'Shi-shu' (西施) is the name of an ancient Chinese beauty who rarely smiled, and her smile would make the kingdom fall. In the modern term and current context in Taiwan, 'beltelnut beauties' refer to young ladies who dress scantily and who work in booths to attract motorist customers to stop and buy betel nuts. The government has posted a 'three no policy' as dress code to bar some improper outfits exposing breast, waist and bottom. This has been a controversial issue in Taiwan society and was selected from the teacher's existing course syllabus as the first online discussion topic in week five.

*Teacher's relationship with students.* The teacher and students had mixed feelings towards one another for several reasons in the beginning of the semester. Students in the research class sent a representative to the teacher to report dissatisfaction with her teaching style of collaborative summary projects without lecturing. The tasks given to students for the three-hour class sessions were to write down a group summary and orally present answers to the given questions in the third hour. This structure was commenced prior to my joining the class as a participant observer. There were affective, cognitive, technical and pedagogical gaps, based on my participant observation, interviews with students, and private e-mails with both the teacher and students. Student participants in this study were sophomore-equivalent, yet freshmen in the two-year college program. Emotionally, they needed the teacher's handholding, while the teacher was affectively foreign to the local culture and this college in Taiwan. Cognitively, she, was a full professor, expecting higher critical thinking skills with better English expression from these sophomores; technically, she was a novice of the E-course system while most students were familiar with it; pedagogically, she had expertise in political science, yet no training in teaching EFL reading to support these students. She attempted to modify the teaching pedagogy after students' feedback and added in some cognitive support by presenting some important

summary points. She was friendly to the students who came to her to ask for clarification of the questions. Nevertheless, somehow there was tension in the class atmosphere.

One issue I observed was students' anxiety over the teacher's particular stress on English pronunciation. Twenty minutes before the presentation, she directed the class to go outdoors and peer correct their pronunciation even when the group discussion was not over. After each group's presentation, she had a habitual pattern of asking presenters and the entire class to repeat mistaken words aloud. I perceived this as CHC teacher authority and probably unnecessary at college level, yet understandable in an EFL environment. At my suggestions of introducing new vocabulary in the beginning of the class to clarify problem points, the teacher expressed that she did not know students' level and difficulties until she heard them present. Some students become overly cautious and nervous about their English pronunciation in class. They were afraid of the possible embarrassment by the teacher's public correction of them on the podium. This was a point of need for pedagogical support and de-construction of a teacher-student power relationship. Nevertheless, anxiety over the English expression and fear of the teacher's authority turned the online discussion forum to an advantageous environment over face-to-face presentation for free expression and critical thinking development.

*Bridging the cultural and technical gaps.* Class observation sessions were lengthy, yet the access to students' critical thinking during the three-hour period was limited due to the type of questions and the fact that some students rotated to search on the Internet in the first two hours. During the discussion time preparing for the presentation, students were grouped into two topics: beltelnut beauties and tourism in Taiwan. Some groups switched their discussion from fluent Chinese to simple English at my approaching and the discussion in the groups quieted down as in a normal CHC learning context. As a result, it was not easy to access their discussion process and critical thinking development.

Here is an example of the teacher's original questions:

- Who explored the betelnut beauties? Why?
- List the findings in detail,

- How would you cover this issue differently?
- What topics would you choose to cover for a trip to Taiwan.

Students' interacted actively within small groups, yet some of the questions were close-ended, not maximising the group discussion for divergent thinking. After two hours of preparation, the third hour was the group presentation time. The teacher used lot-drawing to decide which groups came to the stage to present their group summary and answers to these questions orally. No volunteerism was observed in this stage of 'budding'. As in CHC context, students remained silent unless they were called to express opinions in the face-to-face environment. This result was not surprising in CHC classroom.

*In-Class Technical Demonstration*. I posted the online discussion question twenty minutes before the class session on the campus platform of E-course of Issue Discussion, under Class Interaction. The teacher introduced I to the class to show how different aspects of betelnut beauties may be approached. I thus demonstrated on the class screen how to navigate on the E-course platform step by step for online discussion. This served a simple technical support lesson to the class on how to participate in the online discussion on the class screen. The procedure started by logging into the E-course platform, clicking on 'Class Interaction,' then choosing Issue Discussion, and clicking the 'go' sign to read the discussion messages and 'posting' sign for composing messages.

*Framing the issue*. As Jonassen (2002) urges that problem presentation has to be interesting, appealing and engaging so as to allow students to 'manipulate or massage the problem in order to make it meaningful' (p. 85). To motivate students' interests for the first time in the semester and ease their anxiety in engaging in self-exposed online discussion in English, I framed the discussion question appealing to students. I was given a time in the face-to-face class environment to illustrate the issue. Some details and examples were given in Chinese medicine, Chinese literature, health (causing mouth cancer), environmental, economical (financial gain for the owners and the beauties), social, moral and traffic safety perspectives. The issue was framed and entitled as 'Why beltelnut beauties, why not betelnut O-ji-san?' ('old man' in Japanese, a common expression in Taiwan after the fifty one year colony). The class session was a prepared stage of group

presentation for online discussion.

*Class session before 1st discussion.* In the face-to-face class session, the teacher randomly selected some groups to respond to the following questions on the required reading of betelnut beauties:

- Who wrote the article and why,
- What was the findings,
- How would you cover differently?
- What other topics would you cover about Taiwan?

Students were requested to comment on other groups' opinions. Those groups who did not present in the face-to-face environment could share their opinions online. The online narrative format for problem presentation as in storytelling is an effective way to involve students because it immerses students in the real life context. The following is the starter posting by I, entitled: 'Why not Betelnut O-ji-san?' (betelnut old man):

> Hi,there,
> It's an interesting phenomenon, but there are only 'betelnut beauties,' not 'betelnut O-ji-san.' Do you consider there is any problem in this betelnut issue? If so, why? If not, why? (from Chinese medecine, health, environmental, economical,social,etc...)
> You may also share with us any newspaper coverage about this with us.
> smiling Jean

*Students' relationship with researcher.* The face-to-face interactions with I encouraged those students whose names I now knew to participate online. This is significant in that the perceived relationship with I actually influenced students' participation online. Through some of the early postings, I recognised the authors as small group leaders in class. I had talked to them and asked for their names in person after listening to their active participation and bright performance during the class discussion session. The first posting from the student who talked with I in class and followed I after class. As one of the most active and outspoken students in class, Daffodil tore through the technical and cultural paper wall the next day. Partially due to the framing of the question, most of her classmates followed her tone and perspective. Similar messages actually directed, if not dominated, two-third of the discussion till posting twelve. Most messages

followed Daffodil's notion of sensual appeal to male customers in betelnut business. Here is Daffodil' posting as the first message to beltelnut beauty:

> i think, most of the taiwanese people who eat betelnut are 'MEN'..
> in order to attract men's attention..betelnut beauty has become a kind of advertising or promotion... people would fall in love with its image... the customers, which are over 90 percent men. their job is to show their body, to attract men, to buy betelnut...old ladies are too old to show their body or to show their beauty to others.and certainly, men WON'T be attracted by old ladies..unless maybe they're pervert or something.that's what I think so far...

This message was the first one in the semester. With less than a day of reflection, face-to-face group leader Daffodil's message seemed to be intuitional and spontaneous. One mistake Daffodil made was mistaking 'O-ji-san' as old ladies, rather than old men. Daffodil as a former Japanese major student (known from later interactions) should have known the difference.

I first provided cognitive input and context setup with a variety of online hints, yet students' responses were based on sensual appeal to male customers. As the major purpose in this stage was to invite participation, not critical thinking, it was acceptable to have more students attracted to the new medium by growing a habit of engaging in the online discussion forum in the stage of 'budding'. To re-direct to the next phase of the discussion, I thus needed to deploy the techniques of summarising to acknowledge students' contribution and suggesting for broader angles by shifting the focus of the discussion.

The following message of I was intended to summarise students' viewpoints and re-directed the discussion to question three by the teacher (See Appendix 12). It concerns students' perceptions as local residents after the required reading written from an Austrian urban scholar. Since the E-course logging system only indicates students' Chinese names and school numbers, I used the chance to ask students' English names to better foster the relationship online. Here is the dialogue of the re-directing message from my follow-up question 'Other than attracting business' (See Appendix 12, I):

> xx, xx & xx (By the way, what are your English names?) point out the target customers are male, so for marketing reason, betel nuts beauties are young girls (not O-ji-san) to attract customers to stop by.;(even some female...)
>
> I know many groups have interesting answers to Q 3: What would you cover this issue differently from the Austrian Klopf?
> Can we share our group answers or your opinion about if there is any problem other than attracting business?
> smiling Jean

This question successfully elicited Sunflower's posting of group response, entitled as 'Q3':

> My English name is XX. The decreasing of the betel nut beauties' average age are the changes of moral perspectives (or values) and social (or family) structures.
> In the earlier Taiwanese society, women who 'expose their bodies' are considered 'dirty'. However, owing to the spread of Western, the younger generation in Taiwan are getting used to the 'less and less clothing' and are 'glad' to display their beautiful bodies. What was regarded as immoral is normal now.... parents are too exhausted to displine their children might as well be responsible for it. Plus, the too-easy-to-get information from the press or the internet could also misleads the children, too... It could be wrong since we didn't have much time to do the research...

Sunflower pointed out a different angle from the mainstream here by referring to the social economic change of the society and the moral decline in Taiwan. It is positive cognitive modeling to have divergent thinking.

After Sunflower's 'Q3,' I exercised the technique of 'supporting' in encouraging the participant by stating 'enjoyable to read group xxx from a social-moral perspective'. I then used the technique of 'suggesting' to broaden students' understanding of the issue by posting two questions. As the natural flow of the discussion shifted from saturation of discussion on the salary to the students' own willingness to take the job and win that amount of salary (See Appendix 9, I). I posted the message to solicit students' self-exposure and only Sunflower responded to this request. As this message was towards the end of the discussion, two monologue postings (fifteenth and seventeenth) responding to the initial question 'Why not Betelnuts O-ji-san?' interposed between the dialogues of I and Sunflower on the fourth discussion question 'Would u like to be?' I probed Sunflower on her reasons not wanting to be a betelnut beauty. The following is a sample of my response to Sunflower's message *(in italic)* 'Would u like to be?'

Hi,there,
Hahaha! The answer of Sunflower is very humourous & interesting:
*> I know I will not.*
*> 1.I do not have a good body shape*
*> 2.I am not young enough to be one*

Now just like to comment on some points:
2. Not young enough? Need to be at least 18 to legally work there.

- *3.NT$30000 is not that much*

3. NT30000 is an average entry salary. Many of them got 'commission': (the less you dress), the more you sell, the more you earn. If you are the co-owner, it is possible to have 50000, but no longer 75000 in the highly competitive market now.

- *> 4.It's disgusting to be looked at or even touched by those 'consumers'*

*> 5.The outfits are unbelievably 俗(sorry to use Chinese, but I simply cannot think of any English word that express my feeling better than this word*)

- 5. Hmmm.. The outfit style is different from our fashion in a way.Please check out Binlang Xishi
http://taiwan.8m.net/betelnut.html

*> 6.I can't dance...*
*> 7.My parents and grandparents will KILL me if they find out*
smiling Jean

In my dialogue message above to comment on Sunflower's seven reasons not to be betelnut beauty, I selected three points out of the seven reasons: age, salary and outfits. The interactions in which Sunflower and I engaged involved four turns of dialogue. The first episode ended with Sunflower's defense of her viewpoint by refuting that as a 23 year-old girl, she was over-aged to be a betelnut seller. Sunflower's dialogue with I demonstrated the cognitive challenge possible in the online learning environment in clarifying a claim. The first online discussion on betelnut beauties was a humanistic start, which successfully invited seven student participants to break the CHC silence. The relationship built up in this discussion prepared the next episode on news issue in need of more support.

*Second episode: Taiwan value*. The second discussion of Taiwan value discussed whether economy was more important than environment as a Taiwan value. Students hesitated to respond because they only knew the meaning of 'price' (價值多少錢) in the English word 'value', yet not familiar with the 'value' in this context and its closest correspondence in Chinese concept (價值體系). The word 'value' was not in the required reading texts of

Premier's new policy on earthquake rebuilding plan. It was a word used in the teacher's question. Therefore, students hesitated to respond because they did not know the English word 'value' in this context and its closest correspondence in Chinese concept. There was a period of two weeks silence online before the class debate in face-to-face learning environment. This is an abstract concept in a cognitively complex issue, thus, unlike betelnut beauties, generated no spontaneous replies. More cognitive support was required.

*Cognitive support.* Cognitive support here refers to the preparation for the student-text relationship. Cognitive support may help EFL students to exercise critical thinking on their own English writing. Techniques of cognitive support used in this study included setting the context of an issue, reminding students the stance of author, the assumptions behind, counter evidence, and the credibility of the evidence before logical reasoning for a conclusion was perceived very important and helpful. Students needed cognitive reminders when browsing diverse news sources online to better evaluate the reliability and credibility of the information they encountered, before jumping into a conclusion as they formed their opinions on a complex issue. Here is an example of the teacher's first posting of asking a target question on 'Taiwan value' without cognitive support:

> Hi, my dear,
> This article is on Taiwan value suggested by Premier Yu. Try to rewrite it carefully with your own words. Don't copy too much from Yu's word. Share your group answer here with others.
> What is your perception on Taiwan value? Love Prof.

One week after, no one had posted a reply to the discussion question. I asked some students why they did not respond and they answered that they did not understand the term of 'Taiwan value'. Here is my cognitive support:

> Hi,there,
> Value is something considered important, valuable and useful. Premier Yu represents some of DPP President Chen Shui-bien's ideology and values. Our article 2 Low house loan answers the need of 無殼蝸牛 (houseless). To old people's security, 老人年金 (senior pension). What about some other Taiwan value: 台灣錢演腳目 讀好書賺大錢

(education=wealth) 本土化(localisation)?

As Prof. Leung asked:>What is your Taiwan value? Do you think Premier Yu's represent Your Taiwan value?
smiling Jean

Due to the lack of class meeting, after sets of local examples in Chinese to immerse students in real life contexts as Jonassen (2002) suggests, it took another two weeks for students to start to discuss this issue (See Appendix 12 II). As this topic required more cognitive processing to take students from where they began to where they are able to cognitively address the issue in a public comment, waiting was essential in the stage of 'budding'. Students pondered and observed for a while before posting anything after the class debate. I had to post another message to offer cognitive support and invite participation.

Lavender previously identified as 'silent girl' broke silence by questioning the confusing voices of Taiwan identity. After the intense face-to-face class debate, I invited the class to continue the debate on Taiwan value. It was the third message of invitation with cognitive support of hyperlinks after the teacher's initial question. The classroom affirmative debater Daffodil posted a message and the negative side debater Margarita followed. Later, I challenged Margarita for lacking evidence in her claim:

It is good to hear from XX(Margarita's) debate points for the negative side. It is good to see the evidence of the possible damage of *'ecological engineering techniques'*..... .... However, more information needed to build argumentation from the group's opinion
*[Secondly, to our mind, nearly 80% percent of policies are 'near sighted'..]*

*[which means government just want to get more votes from election]*

*[After winning the election, these proposals aren't continuing....*

Good, but what proposals?... Not sufficient supporting evidence to reach a conclusion. smiling Jean

Margarita did not reply to my challenge, yet her teammate Sunflower found non-statistical evidence to support her point that construction projects primarily hired foreign laborers in hyperlinks. Here is Sunflower's supplement to help Margarita defend Daffodil's attack:

> At 2004/11/18 10:54:08, Daffodil say:
> 1. The economy constructions, such as Shin-tzu Science-based industrial Park, which provided more job opportunities to the people, and also enhanced the neighbor areas' economy growth.
> 2. The Massive Rapid Railway, not only attracted foreign cooperations here in Taiwan, but also boost up the employment rate.For people in Taiwan to have more job opportunities.
> 3. For the tourism, it attracted foreign cooperations to come to Taiwan, and also helped a lot in building the image of Taiwan to the international world wide. Tourism improved a lot in our economy...
> there's no such an evidence pointing that the natural environment was ruined by the constructions. > Besides, the government spent a lot of money on rebuilding those constructions is because it must be rebuilt.

I 100% agree that those constructions will bring A LOT of job opportunities for both "high-tech class" and "labor class". Since the "high-tech class"(sorry, I could's stop my hands from making gestures aside my head!!) is the special group, let's look at the job opportunities for labor class. Are those job opportunities going to the "local" labors? or "foreign" workers? I think the answer is obvious.

The following sites are posted corresponding to the above points

1. http://www.esouth.org/sccid/south/south000106.htm
2. What do you mean by Massive Rapid Railway?
3. http://e-info.org.tw/against/2004/ag04041201.htm

Additional references:

http://e-info.org.tw/sunday/nature/2004/na04041801.htm

XX Sunflower

By the way, I think you are a very good debater and are good at organizing your points.

Thus, as Sunflower proved Margarita's point by supporting with more evidence in more references, face-to-face small group teammates helped one another in finding credible evidence to validate their viewpoints in online discussions.

After my challenge and Sunflower's defense, a new surge of cross-referencing interactions emerged. Wall-breaking image sets out a different learning experience online for CHC students who in face-to-face learning environment would not verbalise true opinions in front of the authority. With regard to the critical thinking demonstrated in this stage, most

of the students were able to point out the problem points of the betelnut target customers as males. They also had sufficient background knowledge on the social economic information on the issue. However, except for Daffodil and Sunflower, most of the messages did not contain sufficient evidence to argue for a claim in the phase of budding. The validity of the information was not double checked through other sources. The description of the budding phase is lengthy, yet this phase established the building block of teacher-student and student-student relationships that CHC students needed in order to be cognitively ready as well as culturally, affectively and technically comfortable to engage in critical discussions. The budding phase helped online participants to familiarise the new culture of mediated communication and prepared for the next act of blossoming, which allowed them to leap ahead in confrontation.

### *4.1.2 Phase of Blossoming: Confrontation*

Stage two is a phase in which the participants had passed through the warm-up stage and actively engaged in the critical discussion on the controversial issues. The stage of blossoming transited from the crossing cultural and technical gaps in the budding stage to leaping of faith into confrontation. After my cognitive modeling for some time, online discussions in stage two were an act of blossoming with numerous cognitive flowers, crossing the CHC social harmony mentality and the tryout phase of budding to embrace diversity as well as similarity in this online learning community. Learning to accept one's disagreeing with others and others' disagreement with oneself is a major de-constructing of a CHC boundary. Students underwent a process of socially constructing a new identity and new knowledge while re-constructing what was previously perceived as unbreakable 'wall' within traditional CHC context.

There were three topics in the second stage of blossoming. The three online discussion topics in this stage included Foreign Minister's LP Incident, Madame Chiang Kai-Shek, and Weapon Purchase. Among the three, weapon purchase was the one of highest cognitive complexity and solicited the largest number of participants and audience involved on the stage. To maximise the dramatic metaphor, I chose to focus on major confrontation in weapon purchase and briefly introduced the other two topics below.

*Third episode: Foreign Minister's LP incident*. The third online discussion topic was on a high profile event of the foreign minister's improper wording in a local dialect in response to another country's criticism on Taiwan's pro-independent path. Students' stances divided into understanding the scenario when the minister was talking with fellows from his hometown and criticising his speech as the foreign minister of the country. There was no debate in the face-to-face class session in week ten, yet the class atmosphere was as tense as in debate due to students' lack of understanding of the teacher's focal point and the lack of cognitive and affective support in the teacher's probing style of questioning students. The first focus group result indicated that the teacher's probing style hinted that only a desired response was accepted, which influenced students' motivation in the discussion and volunteering in face-to-face class.

To help students to better exercise checking evidence from diverse sources, I posted a message with a cognitive reminder about what might be omitted in news sources:

> When we read foreign news agencies' coverage of our Taiwanese local affairs, we need to be very cautious about the 'sources' they used. Foreign correspondents may rush to the few connections they know who speak English, so who says what (and not to cover what?) under what circumstances for what purpose (who benefits from this message?)

With the reminding, face-to-face grouping dynamics transported directly online. After the sixth group response from Lavender, three quiet students from group three: Pear, Plum and Eucalyptus cross-referenced one another under the title 'about Foreign Minister's Incident'. Plum replied to the starter question the day after the class presentation and discussion on Nov 23rd and Eucalyptus swiftly replied Plum the next day on Nov 24th that the entire group three did not consider the foreign minister's talk as a serious trespass due to the unofficial nature of the meeting with pro-independent fellows from his hometown. A third member of group three, Pear, followed on by posting a similar stance under the same title in lower case 'about foreign minister's incident' on Nov 28th. Nevertheless, a fourth member of the group Cinnamon gently refuted her group mates' stance as she added a different viewpoint the same day Pear posted her viewpoint under the title 'President Chen has the responsibility to improve cross-strait relations'. This message was a challenging message to Cinnamon's group mates of group three who unanimously perceived the LP

incident as not being a grave issue. This disagreement was an indicator that the challenging culture was budding in the beginning of stage two in the intra-group context. Cinnamon was courageous to comment that President Chen's administration did not clarify the political stance of Taiwan in his pro-independence motivation to improve Taiwan's foreign situation.

In this stage of online discussion, face-to-face small group dynamics seemed to have an influence on group mates' interactions online to support one another's speech in the online forum. Meanwhile, Bell fruit and Peach from group two also posted messages under different titles 'LP' and 'the relations between Taiwan and the United States' the same day.

*Fourth episode: Madame Chiang Kai-Shek.* The fourth discussion was on the topic of the famous first lady of ours during the WWII, Madame Chiang Kai-Chek. During the time, the class had not met, but was assigned an 800-word summary to be posted in a section on E-course. As this was a sudden cancellation of class and a missing chance that I had originally been invited to take over the class discussion online during the week ten class time, I modified the action research plan and conducted the first focus group and found some interesting factors that influenced students' participation. The attention on the online discussion was deviated to the summary posting then discussing the controversial aspect of the former first lady. Two phenomena were observed. First, some students posted homework in the discussion forum by mistake. Second, the teacher preferred to print out assignments and mark on papers rather than reading and scoring online. The teacher asked students of both the research class and the other class (Lily's class) to post summary online so students would be able to read others' opinions online. Nevertheless, to expedite the teacher's marking on paper, I thus needed to browse and print out approximately one hundred students' assignments for the teacher in return. The positive result of the online homework submitting experience for these two classes encouraged them to grow a habit of regularly logging into the E-course and browsing the content with the discussion. Lily and Lemon were surprising examples that students not of the research class started to critically participate in the online discussion with a class of strangers from the research class in the next episode of weapon purchase as a result of the browsing habit.

*Fifth episode: Weapon purchase*. The fifth discussion topic was the weapon purchase deal of Taiwan from the U.S. The weapon purchase issue was a cognitively complex example in need of background knowledge and cognitive support. The participation curve reached a pinnacle after the class debate. In this controversial discussion, students asked to prolong the length of the discussion twice, ending with forty-four postings.

*Setting the contexts*. I first set the context by the legislative election and presented the hottest issue of weapon purchase in this election. To set online texts, I browsed and selected English and Chinese news articles from diverse political stances from both Taiwan and China to cover different aspects of an issue. Five key aspects were illustrated in the hyperlinks: pro-independent government's decision to buy, pro-unification party's protest, referendum result, the type of weapon to buy and communist China's opposition. The starter message contextualised itself with the upcoming election, entitled: 'How do you perceive the weapon purchase?'

> Hi,there,
> As the legislative election is coming up next Sat 12/11 (oh, are you over 20 to vote next week?), a popular issue in the legislature is the NT.610 billion weapon purchase deal.
>
> Our 2004 March Presidential Election came with a referendum bill, which did not gather more than half of the voters to approve weapon purchase from the U.S.
> Q of the week: how do you perceive the weapon purchase deal? Pros and cons?
> As you browse the links, think about
> 1) What is the stance/ opinion of the author?
> 2) What is the assumption of this stance?
> 3) Is the evidence credible? Double checked with other news sources?
> What is the counter opinion?.....your evaluation after logical thinking?
> Before state your stance, present facts or post the extra links you found online to build up your understanding about this complex issue.
> smiling Jean
> Some links:….

This message provided cognitive reminding to critically evaluate the stance and the assumptions of each author. It also gave instructions to present facts and cite the source before coming to a conclusion. In the following message, I posted an explicit cognitive modeling to demonstrate how to analyze an issue from a model previously requested by the teacher of the class. As most of the students who posted online disagreed with weapon purchase in the first ten messages, I added a new question with more hyperlinks of China's

weapon purchase from Russia, entitled 'How about China's own weapon purchase?' Sunflower soon probed the meaning of 'respond' in my message. Sunflower's challenge is as follows

> smiling Jean says>As China bought more jets, shall we respond or not?
>
> What do you mean by 'respond?' Do you mean should we also buy more weapons to protect ourselves? If so, I don't think buying more weapons will help us.
> ...when we finally get those things, they are already 'antiques.'
> The only benefit I can think of from antique shopping is that MAYBE the US will try to protect Taiwan for the sake of money.

I replied to Sunflower's questioning with a new message entitled: 'After election: Weapon purchase'. I responded to the challenge after adding another new direction in the weapon purchase deal. The following illustrates my cognitive modeling as a reply:

> Hi,there,
> In response to XX(Sunflower)'s Q, the 'response' to a big country's threat could involve different approaches: 1) increase our own (military or tech) capability, 2) build alliance with other stronger country, 3) establish alliance with that country's enemy, or 4) submit to that big country's request of our sovereignty.
>
> Since approaches 1~3 would need help from U.S., buying weapon as I said last Monday was like paying 'insurance premium' for possible war...U.S. is very concerned about China's anger toward this weapon purchase, so U.S. tried to minimise the offensiveness of this by time.
> Smiling Jean

My online challenge also had an impact on other participants' ability to challenge. Lily, a student from another class of the teacher challenged Daffodil in dialogues. The focus was clarifying the problem point on whether Taiwan is independent. The background information here is that fact that Communist China has oppressed democratic Taiwan diplomatically and politically since the 1949 civil war. Here is a sample of the challenge message from Lily of the non-research class on Daffodil's message (in italic):

*Daffodil say:*
*China never ruled us, .. We're already independent.*

If Taiwan is independent, why can't we join the United Nation?
If Taiwan is independent, why are we always having trouble on diplomacy?
We are not independent yet.

>*... Premier Yu claimed that 'balance of terror'..*

*> I'm sorry..But whaT is That???? P~~lea~~se..*
*> 'when China fires one hundred missels at us and we will launch 50 missiles back!' EX..cuSE Me!!! when they fired 100 missels at us..are we still alive??*

I don't think China dares the launch the nuclear weapons, again, don't worry.

*> If this is the reason that he's purchasing the weapon..I'm sorry.. Please..somebody take this idiot out!!*
Please don't call our Premier idiot, if he is, what are we?

*i think somehow U.S is a very powerful and SELFISH country. I bet when China's attack, U.S won't ...fight for us...besides,...we can only defense.*

China is not going to let us buy offensive weapons.
*China claimed that they'll take care of the Strait issue after Olympic 2008...maybe they're willing to communicate with us by then...*
Come on, if we can talk in peace, we would have already talked.
I apologise to you if you feel offended by my reply.
Lily (from the other class)

The cross-examination of Lily on Daffodil's message was quite sharp, yet both exercised the critical thinking in clarifying the problem points of Taiwan independence issue, providing evidence of balance of terror, tackling assumptions behind China-U.S.-Taiwan political stances, and reaching a conclusion with logical reasoning. Nevertheless, as the online discussion took place within a CHC context, and that crossing the cultural boundary of harmony was not culturally acceptable, Lily posted a virtual apology to Daffodil who

defended within three hours at midnight. The following is a glimpse of Daffodil's swift, yet long (4.5-paged) defense message with Lily's comment *in italic*:

> *There are lots of things can show that Taiwan is never an independent country. We are not independent yet.*
>
> Ok..I think we have some misunderstandings here. I was just trying to say that, how do we define Independent? ...if we're under China's pressure, we're not independent? ...we have our own land, own people, own laws, and own president, why we are not independent? ...It's just we're not internationally recognised to be a country... as for me,..we're independent.
>
> *...>I apologize to you if you feel offensive to my reply.*
> It's ok. there's no need to apologize. every person has his/her point of views, you tell me yours, and i share with you mine, we're aiming the issue..not ourselves. So no need to worry about it
> PEACE!!
> Daffodil

The cultural harmony call for peace underlines the fact that confrontation is really not culturally acceptable, especially when the first author's close friend posted a two-line message to 'stand on her side' after my call for a new direction of discussion on the voting result. Even though in the beginning of the semester, I had already reminded the students that it is OK for them to totally agree or disagree with someone as long as there is a logical reason to support it, a lot of emotional energy was looming there online. As a result, the post-confrontation facilitating technique needs to focus on the one being challenged and at the same time moves the class to the new direction of the discussion. The re-set or re-direction of the discussion also requires good timing and reflection for students. I attempted to move on to a new solution combining both sides of voices with self-disclosure after the online confrontation by a message 'Who to vote for'. Nevertheless, students hung on to the argumentation of weapon purchase and supported their fellows. Here is Margarita's support to Daffodil right after the 'Who to vote for:'

> I have to give a big hand to Daffodil because her words are knocking at my heart. As she mentioned above, I am totally on her side.
> ^_____^ Margarita

This message offered overt, verbal affective support needed in being challenged in public with verbal affirmation and emoticon '^_____^'. The emotional pains followed by confronting and crossing CHC cultural boundary were best compensated by the affective support either from fellow classmates. Daffodil gave thanks for the support:

> Dear XX. Thank you..glad we're on the same side..i think we all want to make Taiwan better..and that's the only thing that matters..
> don't forget to vote lah..it's about OUR future~~^_____^
> PEACE!!

Daffodil appreciated Margarita's standing on the same side and in return with another very smiling, friendly emoticon: '~~^_____^'. Although none replied to the message 'Who to vote for', this thank-you message also encouraged classmates to vote to make Taiwan better as they attempted in the beginning of discussion. I originally intended to re-direct and re-set the discussion after the confrontation between Lily and Daffodil, but found the emotional domain needed to be dealt with before moving on to next rounds of cognitive dialogues. From a private interview with two students about debating in the EFL reading class, students strongly opposed having to disagree with one another in public (both face-to-face and online). That tension of the face-to-face confrontation carried on after school and also online. Daffodil tended to post less after this confrontation. She, however, stayed alert about possible challenge from other students and defended herself within a day in the posting 29 in the next challenge. When the challenging technique started its spin in class, more affective support was needed both online and in face-to-face environment to re-build confidence of students who are being challenged.

To re-direct the discussion away from repetition on pros and cons of the weapon purchase deal, I posted the new question on after-election situation under the title: 'Will it be passed now?' Rose replied with a message, logically reasoning the public opinions demonstrated in the last referendum as the key indicator for the issue. She questioned the aftermath of the election in relation to the previous referendum, which did not garner enough supporters to

pass the weapon purchase deal. She wondered whether the newly-elected would respect the public's opinions despite a political move to pass the deal as shown in the news hyperlink.

The weapon purchase discussion had no closed ending. However, the phase two online discussion had a marvelous breakthrough as students dare challenge one another, risking violating the CHC 'wall' and even challenged I in Sunflower's probing of the definition of 'respond' to China's own weapon purchase. This is an act of blossoming, the leap ahead in public confrontation, re-constructing a new cultural boundary online for CHC students as they related to fellow classmates, students from another class and teachers in a culturally, affectively and cognitively new way.

*4.2.3 The Phase of Fruiting: New Boundary*

After the leap ahead in confrontation, the third stage is the final phase that culminates and concludes the online discussion experience of the semester. This stage indicates a natural process from continuation of blossoming towards a decline of group dynamics as the semester was closing down towards the final exam.

*Sixth episode: First lady.* The sixth online discussion was the extension of the face-to-face semi-debate group presentation by all eight groups. The topic was Taiwan's first lady and her trip to the Para Olympics in Athens. The online discussion had undergone four directions, successfully interwoven perception of the first lady with her presence in Paralympics downgraded by rival China, comparison of the three first ladies and the film review. This discussion was particularly long as the wife of Chiang Kai-shek's son passed away during the online discussion.

A chain of ten messages responded to and cross-referenced on one of Sunflower's posting entitled: From Sunflower. She held an opposite opinion to the rest of the class in the semi-debate in the face-to-face learning environment. She quickly posted in online discussion the same day and re-stated her strong disagreement to the first lady's presence to Paralympics as the follows:

> As we all know that Taiwan is (always) facing a very difficult situation in diplomacy. Under the pressure from Beijing, the chance is slim for Taiwan to gain a stand point on the international stage.
>
> I think our government is basically doing everything they can to earn more attention from the international society, which is of great importance because we do need support from other countries.
>
> The trip our first lady took to the US is a great example. I think our first lady did a very good job because she sure did draw a lot of attentions. When people know more about Taiwan, it's more likely that they will pay more attention on the diplomatic difficulty Taiwan is facing.
>
> Although a lot of people out there think that this trip will not help Taiwan's situation, but as a representative of Taiwan, at least our first lady showed her perseverance and willpower to the world. Her trip delivered a message to the world that Taiwan is still trying and will not give up.
>
> The Paralympic, however, is another story. As what I said in the class, politics never should interfere in this kind of activities. It is possible, although I still think it's not, that our first lady's participation in this event is not about politics; but it is still true that her participation brought troubles to the IPC (International Paralympic Committee).
>
> There is no doubt that the dispute happened because Beijing put pressure on IPC. However, as our vice president said, the pressure from Beijing is predictable. In other words, our government asked for it.
>
> Although we have faced a lot of pressure from Beijing, we should never surrender. That is why I think our first lady's trip to the US is of great importance. However, in my opinion, it is basically wrong to bring politics into Paralympic (even if our government might not have the intention at first).
> from XX Sunflower

Due to the senior position of Sunflower and her strong tone, Rose's reply was an indirect one in posting eleven. Rose did not directly reply Sunflower, but Lavender's posting nine instead to continue the approving stance to the first lady. Rose's indirect criticism on Sunflower's viewpoint was a CHC way of protest. In the private interview prior to the second focus

group, Rose expressed her opinion that it was more empowering to reply to someone already in line with one's viewpoint than to confront with an opposing senior. She broke the silence and challenged a more outspoken senior both in class and online. After that, Lily, from another class, continued with an even sharper criticism of Sunflower. Upon this point, Sunflower e-mailed me and asked what to respond as she previously did not know that it was International Paralympics Committee who initiated the first lady. As there were ten postings as dialogues with Sunflower, I replied to Sunflower that she may frankly thank and acknowledge classmate's information. I also re-directed the discussion. In the second question 'Recommend her to go in 2008' elicited some more responses. Rose took up the role of a mediator to smooth out the conflict and conclude this series of challenge in response to Sunflower's apology for using the word 'we asked for it':

> Dear all,
> Well..I don't think we have to feel sorry to have different opinions because everyone can have his or her ones. Our first lady was invited to the Paralympic;however, she was involved in the controversy because she is the wife of our president. Should we blame her or her title of being the first lady?? If she were not the first lady, and we would not discuss this issue now.
> smiling Rose

More messages with affective support swiftly followed the movie on the three first ladies from both the research class and the non-research class after the film while the discussion continued in week sixteen. The confrontation shifted the cultural boundary from indirect towards openly confronting. This experience of online conflicts called for a new cultural boundary emerged within these participants in normalising the confrontation as part of democratic culture online.

*Seventh episode: President Lee's trip blocked in Japan.* Discussion seven explored how students responded to issues without my physical presence in face-to-face class in the final weeks. Due to the pressure from the final exams and the lack of in-class lab time, the online discussion was more like a forum of monologues. Soloists posted and shared hyperlinks concerning the former president Lee Teng-hui's trip to Japan, who was blocked from

entering his alma mater, University of Kyoto. Recognised participants included Daffodil and Rose. Participants merely browsed without discussing in depth. Rose' comment on China's ever-present blocking did not receive any reply: 'Dear all, What are they against? Lee Teng-hui? Taiwan? Everything related to Taiwan?' As not much interaction was generated at the end of the semester, the online research study came to a conclusion as in autumn.

The following table (Table 4.1) summarises the general information in the seven online discussion episodes of the semester.

Table 4.1

Number of Postings and Students in Online Discussions

| Topics | No. of Postings | No. of Students | Length (days) |
|---|---|---|---|
| Betelnut Beauties | 19 | 7 | 14 |
| Taiwan value | 27 | 12 | 28 |
| Foreign Minister's LP | 17 | 13 | 7 |
| Madame Chiang Kai-shek | 14 | 8 | 5 |
| Weapon purchase | 44 | 20 | 27 |
| First Lady of Taiwan | 53 | 22 | 23 |
| Lee Teng-hui in Japan | 9 | 5 | 4 |
| Total | 183 | *89 | *108 |
| Average | 26 | 12 | 15 |

*A total of 37 students participated online. The online experience endured for 85 days.

There were a total of 183 messages posted in the seven online discussions under the Topic Discussion Board in the E-course Class Interaction interface (excluding 27 more messages in the class bulletin board on students' preference of face-to-face and online modes). Some of this information is listed below:

- Each online discussion received an average of 26 messages.
- There were 37 student participants including 28 from the research class and nine from another class of the same teacher.

- Each online member posted an average of 5.4 asynchronous messages.
- An average of 12 students participated in each online discussion.
- The duration of the online discussions was 12 weeks, starting from week five to week 16.
- Each discussion lasted 15 days on average. The deadline allotted to each discussion was originally two-weeks except one week for the third and fourth discussions for assignment and real time chat. The ending point was modified according to students' responses and requests to prolong the discussions. In the episode of 'Taiwan value', it took more than two weeks for the class to start discussing due to lack of understanding of 'value' and a shift in class time. The duration discrepancy will be discussed later.
- The topic of 'first lady of Taiwan' received the highest degree of interest, while 'weapon purchase' invited the second highest online participation. The number of the participants in the first lady discussion was triple that of the discussion of the foreign minister.
- 7 students had 17-177 logins and posted between 5 and 21 messages. The following 8-20 had logins ranging from 43 times to 11, but only posted 2-4 postings during the study.

Please refer to Appendix 11 for details of online participants' number of postings. The following discusses the reason why the seven online discussion episodes received different levels of participation and under what circumstances students delayed their initial postings as in the second discussion episode.

This section has described the full cycle of the seasons. From budding to blossoming to full bloom when the participants broke through the barriers of the 'wall of silence' to the closing act of fruiting where the dialogues lessened in the online environment. Participants crossed the CHC cultural boundary of silence and harmony in critical thinking development. The next section illustrates the critical thinking demonstrated in both the face-to-face and online environments.

## 4.2 Students' Critical Thinking Development

One of the key issues in the research question was how student-teacher and student-student interactions influenced students' critical thinking development. To answer this question, I attempted to approach the question from the students' own perceived critical thinking development as expressed in the focus groups and perceived of in the online discussion analysis.

This section will provide a comparison of students' verbalised critical thinking presented in an early episode and a late episode of the online discussions. Critical thinking was collected and analysed according to the operational definitions of critical thinking (See 2.2.3). However, critical thinking which was not verbalised in face-to-face class discussions and online discussion was not available to the data collection of this research. Students' private discussions of the issues, at which I was not present, were not included in the study, as their reporting would contain secondary rather than primary evidence. The following is an illustration of students' critical thinking demonstrated in this research study in the second discussion on Taiwan value at late budding and early blossoming according the operational definitions of critical thinking.

- The problem was pointed out as whether the development policy outweighed economic benefits over the environmental sustainability.

- The background knowledge on re-construction of the earthquake-stricken and flood-hit areas was briefly mentioned, but the real needs of the people were not offered to support that claim that the government did not plan for people's interests.

- The unstated assumptions were recognised that re-construction statement was paved primarily either for policy makers' future votes or corporations' benefits.

- There was no distinction of facts of floods from typhoon from the opinions and inference that government development projects caused floods or Taiwan value.

- The credibility and validity of the evidence were not checked to prove that the ten national major development and the Su-Hualien Highway had (or did not) negative impact on environment as it claims.

- No comparing and contrasting of different sources of information was made.

- A conclusion that the government development was (not) for the greatest interests of the people through logical reasoning that the development benefited (or not) the victims, yet the environment was damaged at the same time, yet without diverse sources of information.

- Cognitive flexibility and consideration of affective and cultural factors involved in an issue was particularly not seen. The flood-stricken mountain residents actually supported the government development to boost the economy on the emotionally-attached mountain, while environmentalists did not see the cultural factor behind the indigenous people's refusal of mass village re-location due to their cultural heritage on the mountains.

The following is the comparative illustration of students' critical thinking demonstrated in the sixth discussion on Taiwan's first lady's attendance of International Paralympics in the final phase of fruiting according to the operational definition of critical thinking:

- The problem point of the issue was clarified that the first lady was brave in face of Beijing's blocking and pressuring.

- Background knowledge was offered about her physically challenged condition and Beijing's hostility in blocking all international events. Students have sufficient knowledge background and have learned to search relevant background information through several academic and commercial search engines in this study.

- The unstated assumptions in the statement was recognised in that politics were virtually involved in almost every dimension of international activities, with no exception to Paralympics. Students

- Distinction of facts of Paralympics' invitation for Taiwan's first lady from opinions of China's political intervention was made by one student. The focus was blurred in validity of justifying the first lady's attendance in the event and the downgrading treatment of her status by China's protest.

- The credibility of the evidence was double checked by different sources to claim the justification of the first lady's attendance in the event: she was invited to be a honored guest by Paralympics. This critical skill was exercised, gradually polished and improved by checking evidence through previous five face-to-face and online discussions. The weaker point was that students had a tendency to be more critical at opponents' sources of information than sources of similar arguments to their own. Second focus group results also indicate that students always double checked opposing arguments' evidence, yet not always examined the evidence of their supported argument.

- Comparing and contrasting different sources of information was made, yet without citing sources. Some students were not informed about the fact that the first lady was invited, thus came to a different conclusion. They could now openly compare and contrast different sources of information in online discussions, though for Rose in an indirect way.

- The conclusion was reached by logical reasoning with diverse sources of information that the first lady's leading of the delegation was a successful (or unsuccessful) trip. Students exercised evaluating an issue by different sources to overcome bias in siding with one argument and its relevant sources. They came to a conclusion not by spontaneous responses as in synchronous real time chat or small group discussions. They processed deep thinking and composed their evaluative comment after reading diverse articles and other online members' arguments. Critical thinking development could be traced by this phase in this aspect.

- Cognitive flexibility and consideration of affective and cultural factors involved in an issue was particularly seen. The cultural factor between China and Taiwan was a sensitive issue involved. The human element was added to students' understanding first lady's affection for other paralyzed fellows when she became the physically challenged by a politically motivating car accident after election. Students with their cultural background attempted to exercise affective and cultural flexibility, yet the political stance was subjective issue that could not be easily confronted with for some students as Palm expressed in the meeting prior to the second focus group.

In the second focus group, I asked the seven students who were either active online participants or had information about critical events in the face-to-face debates and online environment: To what extent do you perceive your ability of critical thinking based on the operational definitions of critical thinking in this research? The following was a summary presentation of students' opinions:

Students perceived that they were able to clarify the problem points in most of the issues discussed online quite effectively most of the time. Students were often aware of the background knowledge needed to support a claim. Students were not sure of the ability to recognise unstated assumptions in a statement on a regular basis. If a news story posed a different viewpoint from the readers, they may question the political alliance behind the news source. However, if students did not have sufficient background information concerning an issue, they may be able to observe what was assumed in the news source and what was purposely omitted while some information was chosen to be published and broadcast. They could not always see who said what on what circumstance for what purpose and for whose interests.

Meanwhile, students were confident in distinguishing facts from opinions effectively both in news reading and other classmates' online postings, yet they did not always present facts first when they expressed their opinions. Inference was not used much as the distinction of facts from opinions, as students responded that they did not always exercise inference of

logical reasoning to reach a conclusion based on the facts found. Logical reasoning was stronger on occasions when they understood the issue better. Nevertheless, I observed more inference on the online discussion towards the end of the semester. One example was that of discussing whether the first lady of Taiwan should have attended the Paralympics at China's blocking. While one group criticised her presence as a political show, one student argued that she was invited by the International Paralympics Committee, thus was fully entitled to attend the event.

However, students expressed checking the credibility of the evidence only in debate situations. I observed early examples in the case of Margarita in first two discussions: 'a research shows' and '80% of the government projects…' without citing the source. Later in the discussions, Daffodil provided a figure with a news link as evidence to support the claim while Sunflower also found evidence to support teammate Margarita's statistic claim. Despite the lack of using evidence in the budding stage, students overall grew the habit to refer to some evidence mostly in hyperlinks of news articles.

Comparing and contrasting different sources of information was not used on a regular basis. One student suggested that students needed to read a lot, and purposely from news sources of opposite political stances. For example, if they read articles from the democratic camp of Liberty Times, they also read articles from a more republic camp of United Daily with an addition one from a Hong-Kong based tabloid newspaper Apple Daily. In other words, pro-independent, pro-unification and business-oriented sources were all needed to have a balance viewpoint.

Students observed a tendency to reach a conclusion by logical reasoning yet not always with diverse sources of information to support it. They could support a claim with the evidence they preferred, yet did not refute the opposite argument by the evidence provided by others or from a broader spectrum of sources except few. Rose indicates in the second interview that they did not sway to parental political stance without critical thinking when they discussed the controversial issue in class. Nevertheless, logical reasoning was seen with emotional attachment on students like Cinnamon with anti-government stance in most

issues. To sum up, logical reasoning was seen, yet the backing up of the statements was occasionally feeling-led in the initial stage. In political issue about Taiwan unification involved in the first lady's trip blocked by China, students exercised logical reasoning and passed the phase of using selective evidence to positively reinforce an existing stance.

Cognitive flexibility and consideration of affective and cultural factors involved in an issue was seen in students' understanding of the local, social and political controversy. In terms of cognitive flexibility and cultural consideration, students responded that they understood the LP incident of the Foreign Minister of Taiwan in its context with the grass-root use of Taiwanese dialect among middle-aged men with hometown fellows. Sunflower, the senior strong advocate in semi-class-debate also processed her critical thinking and minimised her personal opinion about the first lady. She exercised cognitive flexibility and changed her view after classmates provided the evidence that was essential to rebut her argument. Therefore, students overall demonstrated cognitively flexibility and cultural consideration in the foreign minister's improper wording in dialect in an informal meeting.

In conclusion, students perceived that their critical thinking has improved in this study according to the second focus group. Sunflower concludes that even though some students paused in silence at my challenge and others' questioning, their critical thinking developed as well. She saw a distinguishing improvement in group mates' critical thinking in checking assumptions and evidence before supporting an argument in face-to-face small group discussions and private dialogues on other current issues. This indicates the limitation of the analysis above in the amount of observable critical thinking demonstrated during the data collection process. Critical thinking, which was not exercised in online and classroom settings or did not specifically match the critical thinking indicators in this study, was not reported in this section. In cases which involved political controversy, students reported that the CHC component may initially hinder some classmates' online participation, yet they managed to cross the boundaries in different ways and paces. Rose used indirect way to confront with Sunflower's point in her first ever speech in face-to-face learning environment, and later online. Publicly disagreeing with a senior student who was a strong debater was a clear indicator of affective and cognitive breakthrough in CHC

boundary in critical thinking development. The following section will discuss what models of interactions helped create environments that fostered such an experience.

## 4.3 Models of Interactions

This section attempts to evaluate the models of interaction in both face-to-face and online learning environment. The models of interaction included the synchronous mode of small group real time discussion, asynchronous mode of class discussion, and five models of face-to-face interactions: face-to-face small group discussion, face-to-face group presentation, class debate by six students, group-supported class debate, and semi-class debate by all groups. These are summarised in Table 3.2 Modes of Interactions in chapter 3.

No face-to-face model or online mode of interactions was perceived as the best on its own. Students indicated in the second focus group no preference over a range of mixture of online discussion, yet liked different modules at different stages could create diverse results of interactions. The findings of this research study showed that face-to-face group support was an influential factor in initial discussion stage. In the group reflection sheets distributed before the first focus group, seven out of the eight small groups in this class preferred processing critical thinking face-to-face in small groups. The reasons included face-to-face opinion-sharing, immediate question-asking and answering, effective exchange of background knowledge, collaborative thinking for a resolution, and instant feedback to clarify problem points after online browsing. Two groups who favored face-to-face small groups, but did not list reasons simply wrote: 'Highly recommended' and 'Face-to-face is the best way for people to communicate with each other'. Based on participant observation, many students' facial expressions changed from confusion with tight body posture to gradual smiling and nodding with understanding after the small group discussion. Most students acknowledged that face-to-face small group discussion was effective for emotional affiliation, sense of security in groups, and immediacy that help develop interactions.

There were however three other face-to-face models of interaction developed in this study: randomly allotted group presentation, class debate by six students, class debate by six groups and semi-debate group presentations by all eight groups. In the model of face-to-face group presentation, students found this model of group presentation efficient and non-threatening, but not all groups shared their opinions.Since the first two questions were based on factual information, not much critical interactions were observed. Some groups were repeatedly chosen by the teacher's lot to present group ideas. No much student-student interactions were generated. As students were selected by lot-drawing to answer the teacher's question and present summary, the participation rate was limited. Also, in this model of face-to-face group presentation, some groups did not have unequal chance of verbalising ideas in face-to-face discussion session. This situation prepared an advantage in the online forum for equal participation.

A different face-to-face model of interactions was utilised to help engage students in the discussion: face-to-face debate by six students. Please refer to Figure 3.1 Class Debate Model by Six Students in chapter 3. In this face-to-face model of interactions, six persons were selected by their groups to be debaters. The topic was on whether the government's re-construction for the earthquake-stricken areas served the best interests of Taiwanese people in line with Taiwan value. The class atmosphere was tense due to the first-time ever debate.

To compensate the lack of participation from the floor and debaters as only volunteers from each group, the second class debate on weapon purchase modified slightly according to the group reflection sheets. Students reported in the group reflection sheets that debates were pressuring and in need of time for cognitive preparation with the exact topic announced the week before, yet the teacher preferred to announce it after the browsing hour due to the initial experience that students complained that the teacher did not teach much in the three-hour class session. This time, the teacher designated that the six debaters were drawn by random numbering for fair chance and group mates sat right behind them for immediate student-student support and increase non-debaters' participation. Please refer to Figure 3.2 Group-Supported Model of Class Debate in chapter 3. As debaters were chosen twenty minutes before the debate by 'luck' not will, they needed sufficient English proficiency to

translate the group ideas of intense Chinese discussion into English with good organisation, clear presentation techniques full confidence and teamwork spirit. In view of this, EFL factor and presentation techniques were found influential in successful English debates other than sufficient information from all sides and critical thinking.

Suggestions from students' focus groups included:

- informing debate questions one week ahead for better cognitive input
- assigning negative or affirmative groups before online browsing so that lab browsing could be more focused and effective in searching and taking notes of evidence needed to support a claim
- better language support during the preparation period by providing essential phrases, terminology and supervising of English-only small-group discussion.

Some students found the hostility overly strong among debaters, breaking the social norm of harmony in CHC mentality. However, some students said that it was because classmates did not adapt to the debate culture to clarify complex issues and allow open discussion as a learning community. An important issue was that it was not to be taken personal after the debate was over. Chinese students tended to refrain from openly opposing an opinion from fellow classmates within the face-to-face class environment. The challenging from the debate stage shifted to the online stage for the blossoming act of leaping ahead in confrontation.

The third model was a semi-debate of face-to-face group presentation, which included making criticism on the previous group. Please refer to Figure 3.3 Semi-Debate Model by All Eight Groups in chapter 3. The topic was perception of the first lady's delegation to Paralympics. There were eight groups and the seats arrangement was planned in a format to maximise social construction within each small group. The teacher planned this to foster student-student interactions three-fold: Interacting within the groups, among all the group presenters, and between the student judges with the group presenters. The class atmosphere was quite tense as everyone needed to be cognitively and linguistically ready before the teacher chose a number in each group. While adding judges from each group and increasing participation from all eight groups, this model placed pressures on

presenters in presenting well-rounded information and fostering collaborate critical thinking.

According to the second focus group, students' perceived the semi-debate model positive for two reasons. First, each group had equal participation in the face-to-face interactions. Second, student-student interactions were encouraged within the groups as they sat nearby to support the presenters. Rose gained confidence through online discussions and had courage to face-to-face indirect challenge the best presenter Sunflower in the semi-debate model of group presentation. One suggestion was made to add diverse questions to avoid repetition of similar content and have free and open discussions. The summary-like group presentation on the same factual questions did not encourage challenging comment on all eight groups.

Despite some limitations in each model and constraints by tasks set by the teacher, students in the second focus group expressed the advantage of having different models each time, varying between small group discussions, debates and semi-debate presentation. After discussing the differences of four face-to-face models of interactions, let us move on to the online modes of interactions: asynchronous or synchronous.

With the critical thinking-orientation of the research, a majority of students favored asynchronous mode over synchronous mode of online interactions according to the group reflection sheets. The critical thinking-oriented research class had all seven online discussions in asynchronous mode of interactions, while they officially tried out synchronous mode of interactions in discussion three. An experiment was implemented using synchronous mode for small group discussion in the last fifteen minuses in the browsing hour. It was not successful, due to the lack of background knowledge and pedagogical discrepancy between the teacher and I. The teacher was not familiar with the E-course. As some students had finished, others were still browsing, thus logging into the real time chat was not practical. Cognitive readiness varied between group mates, thus in-class critical chat in English was not feasible. Two weeks later, group four students initiated 124-entry synchronous discussion voluntarily. They were the only group who favored synchronous mode. Figure 4.1 gives a glimpse of the weapon purchase

synchronous discussion. In the real time chat text sample above, Chinese was mixed with English. Students summarised key points in English for presentation or debates in English. As students typed really fast in real time chat, sometimes they had typo or doubled sent the same line. Time lapse also made the question-answering interesting: entry 106 was a question on 'Aegis' while entry 107 replied to entry 105's protest with 'pearl milk tea'. It was disconnected by Macadamia's entry 108 and the response of 'Aegis' as a weapon name was finally given in entry 109. It was not surprising in the initial trial, some logged off to discuss face-to-face with group mates beside.

Figure 4.1

Sample of Synchronous Discussion Text

95: >Apricot : still don't have the outcome, i guess (13:56:14)

96: >Almond : 行 政 院 好 像 要 讓 立 法 院 三 讀 通 過 才 可 以 軍 購 (13:57:25)

97: >Almond : 不過總是不能闖過立法院..都被反對..所以現在陳水扁好像就想藉人民的意願來實行... 新聞是降講的啦..唉... (13:58:47)

98: >Apricot : 好 像 是 這 樣 勿 說 (13:59:04)

99: >Apricot : 好 像 是 這 樣 勿 說 (13:59:04)

100: >Rosemary : hmm..so..does KMT support this issue? (13:59:34)

101: >Macadamia : 又 要 來 個 全 民 公 投 勒 嗎 (13:59:50)

102: >Almond : KMT 在 立 法 院 多 數 阿 .. 所 以 當 然 是 反 對 .. (14:00:10)

103: >Rosemary : pan bule do not agree this issue (14:00:12)

104: >Macadamia : another oppositive (14:00:18)

105: >Apricot : so they held a protest right? (14:00:44)

106: >Almond : 'Aegis' 這 是 什 麼 ... (14:00:55)

107: >Apricot : pearl milk tea.... (14:01:02)

108: >Macadamia : perchasing weapon will pose the peace between taiwan-china (14:01:27)

109: >Macadamia : one kind of weapon' (14:01:44)

As the main purpose of synchronous real time chat was to share background knowledge and clarify problem points, the synchronous mode of interactions served a similar function to face-to-face small group discussion. Three of the students in this group only participated in synchronous group chats three times without contributing to the asynchronous online discussions.

Though students did not state a clear preference of combination of the face-to-face models and online modes of interactions, combining a variety of models at different times was interesting for them. The model would start with online browsing as preparation, then face-to-face small group discussion to clarify problem points, finally with any other face-to-face models like group-supported debate or asynchronous online discussions. Repulsion against debating was prevalent in the first focus group, yet students who sustained to the end appeared enjoying the challenge of debate in critical thinking.

## 4.4 Summary

This research study invited CHC students to a journey traveling between cognitive, affective, cultural and technical walls in the face-to-face and online learning environments. The teacher's role as a shepherd was effective in providing students cognitive, pedagogical, affective and technical support in both face-to-face and online environments. The shepherd leading first in face-to-face learning environment and later in online environment assisted quiet students to gradually build up confidence to verbalise thinking and engage in critical discussions with others.

Three phases were witnessed in this research study. In the initial phase of budding, the majority of students observed the outspoken face-to-face small group leaders interacting with I online. The shepherd leading elicited initially seven leaders online who later influenced five times more to participate in online discussions. Group-chained interactions prevailed as group members followed verbal face-to-face small group leaders. After breaking the cultural and technical walls, subtle inter-group disagreement became more intense with conflicts and occasional flaming and conflict-avoiding silence in the middle

phase of blossoming. The non-research class participated at the end of this phase with inter-class disagreement. The final phase of fruiting encouraged both verbal and quiet CHC students to undergo critical thinking development from silence to overt and explicit participation, from agreeing to challenging, from conflict-avoiding silence again to post-conflict critical participation by multiple users.

The CHC bond of silence and harmony gradually lost its grip and a new boundary emerged in online interactions where critical thinking was verbalised unobstructed and conversed behind the screen as Merryfield (2003) suggests as like a 'veil'. After discussing the findings of how shepherd leading online fostered critical thinking in student and teacher interactions, the next chapter will discuss the findings of this research study.

# CHAPTER 5

# DISCUSSION

*"Human learning occurs through a combination of processes in which a whole person (body, self, and mind) enters a social situation and constructs an experience, which is then transformed by though, action and emotion…"(Javis, 2003, p. 2).*

This chapter discusses the issues revealed in the analyses of the research data in relation to the online interactions and responds to the research questions. Section 5.1 (Factors that Impacted on Online Participation) of this chapter discusses the factors that influenced students' online participation and 5.2 (The Teacher's Role) will address the research question about EFL teaching in terms of four aspects: cognitive, affective, technical and pedagogical support. Section 5.3 (Students-Student Online Interactions) illustrates the issues concerned with students' online interaction patterns, with special attention given to conflicts and challenges in relation to silences as students struggled between the online social cultural norms and changed the boundary of CHC. Section 5.4 (The Shepherd Facilitator) attempts to answer the first sub-research question on the role of the online facilitator and its impact on students at different stages. Section 5.5 (Models of Interactions) aims to respond to the second sub-research question on the models of interaction which helped foster critical thinking in this research study. Finally, the chapter concludes with Section 5.6 (The Face-to-face & Online Interaction Development) which evolved in the study as students switched between online and face-to-face learning environments.

## 5.1 Factors that Impacted on Online Participation

In the first focus group (held in week 11), seven 'early' online members identified a number of factors for the different participation rates including existing student-student relationships, familiarity with and the motivation of the discussion topics, clarity of questions, perceived teaching style and support from the teacher. These factors are addressed below:

*Existing student-student relationships.* The first factor in this dimension was the closeness of the existing student-student relationship. As these CHC students became more familiar with one another in the face-to-face class environment, they became more open in an online forum. This was shown in the group-chained interactions (see Table 5.3 Inter-group, Intra-group, Inter-class Interactions in chapter 5) in the initial phase of the online discussion. Group members followed their group leaders' postings. Seven group leaders posted online in the first discussion and this led to 12 online members posting as well in the second discussion, which became a total of 37 by the end of the semester. In the first discussion episode, the group leader of group five brought into the discussion two more group members by her example. Students indicated that while they did not necessarily agree with group mates, they felt secure to comment on, or further support group mates' messages. Even when both the research class and the non-research class interacted together, they generally chose to agree with their classmates, posting similar messages. They challenged only the messages of those unfamiliar to them. The CHC boundary may have contributed to this emphasis on existing social relationships. Relationship building was thus crucial in the online learning environment.

*Familiarity with the issues.* The degree of students' familiarity with the issues also influenced students' participation. Students needed sufficient background knowledge before posting their opinions and judgment online. When they were more familiar with the issues, they responded to the starter question and others' messages more quickly and the online dynamics spurred earlier. Cognitive output is thus related to the amount of existing cognitive input students installed in their mind. An example was the first episode of betelnut beauties. Students found this social phenomenon quite familiar, thus the online discussion started the next day after the question was posted online. However, in the following more cognitively complex episodes of 'Taiwan value' and 'foreign policy', students needed more cognitive input and a longer processing period as warm-up for the discussions. 'Taiwan value', as an abstract and culturally distant term to verbalise in CHC culture, took more than two weeks to initiate real discussion. In the 'foreign policy' episode, the initial browsing was longer, thus in-class synchronous real time chat was not successfully implemented. Therefore, as the cognitive complexity of the issues increased, more time and support were needed for students' cognitive processing of the diverse

information before they could verbalise their critical thinking.

*Topics of interest*. While some students recommended making online discussion compulsory for all students with extra bonus points for active participation, students needed motivating topics to stimulate their interactions. The topics in this reading course concentrated on political issues, thus the Internet-supplemented online discussions selected more controversial ones from the curriculum. The most popular topic was Taiwan's first lady's participation in Paralympics, which was a news story of humanistic interest. The second most popular topic was 'weapon purchase bid', which was a news story of political controversy during the election month. The third most popular topic was 'Taiwan value', another news issue derived from the government policies. The fourth most popular topic was 'betelnut beauties', a social phenomenon of news type, commonly discussed in the local media. Surprisingly, opposite types of topics triggered students' interest. Despite the time factor involved in the online interaction development, students enjoyed discussing both political and humanistic news online. The top three topics were discussed in debate or semi-debate modes in face-to-face class time, thus impacting students' affective and emotional responses and cognition more deeply. This was transferred into their online interactions. Nevertheless, students suggested a variety of issues of their interests, which implied a need for autonomy in topic selection.

*Clarity of discussion questions*. In addition to the above, the clarity of the teacher's discussion questions was an important factor, which influenced online participation. Students noted that they attempted to grasp the actual referent to teacher's question. In the second discussion of 'Taiwan value' on economic over environmental value, students needed my online explanation as something people cherish and perceive important in life (something related to 'a system of beliefs and deeply held true concepts' 價值體系 or價值觀) with concrete examples in Chinese and English. Clarification and explanation were needed to clear up students' problem points. In the third discussion of the foreign minister's improper wording, there was a discrepancy between the teacher's expectation and students' focus on a single event. Students felt confused when the teacher announced the browsing keywords were 'Taiwan's foreign policy', yet the third online discussion

focused on the foreign minister's incident. Students found hundreds of online entries about Taiwan's policies ranging from policy to EU to Africa, which did not help them to present the teacher's desired answer: the government apology and the larger context of relationship of Taiwan, U.S. and China in APEC summit. There were at least three layers to this issue, so students found the need to be more secure about whether they were on the right track understanding the questions correctly in preparing for face-to-face and online discussions.

*Teacher's style*. The teacher's facilitating style was also found to be influential in students' motivation in online participation. Students stated that the implied response from the teacher influenced and elicited desired answers. Teacher's directedness and authoritativeness changed the direction of students' responses on the third discussion topic in the face-to-face group presentation. In the first focus group, students perceived that the teacher preferred certain partisan stance and answers and did not verbally approve students until a desired opinion was heard in their responses. Students at times felt the teacher's dissatisfaction and hesitated to respond, resulting in a lack of confidence in tone, volume, posture, and eye contact, which led to the teacher's questioning of students' efforts in discussion preparation in higher tone of voice. A less verbal student who became active online indicated that she would not express her online viewpoint in a face-to-face class nor take an opposing stance against the teacher. The students suggested that the teaching style needed to be more open and liberal to answers which differed from those of teacher's in order to guarantee CHC students' honest expression operating on more than one set of frameworks first in class and then online.

To sum up, the factors students identified as influential to online participation included existing relationships among students, the degree of familiarity with the issues, motivation towards the issues, clarity of the discussion question, responses implied by the teacher and the teacher's style. Learning thus involved the affective and cultural domain in relationships and later cognitive factors in the understanding of issues and verbalising of critical thinking in culturally appropriate form. In an affectively supportive environment, CHC students were encouraged to interact with each other by student-student and teacher-student relationships.

## 5.2 The Teacher's Role

The overarching research question was

- *How do student and teacher interactions impact critical thinking in face-to-face and online environments in an EFL course at Taiwan?*

The following discussion will address the impact of the teacher's role on students' critical thinking from cognitive, pedagogical, affective and technical aspects in the face-to-face and online environments. The first section considers cognitive support utilised in this study.

### *5.2.1 Cognitive support*

As suggested by Norton and Norton (2005) and McNaught (2003) in structuring the online experience to meet learner needs (See 2.3.2), cognitive support was used in this research to represent cognitive assistance in all areas for the preparation for the student-text relationship. Similar to Taiwanese EFL educator Chiu's (2004b) finding, cognitive support was found crucial in this current study in helping students build up a cognitive base on an issue with an input of knowledge and comprehension gradually moving towards cognitive processing and an output stage. In this study, cognitive issues were found in need of more cognitive support in advance of the activity to allow sufficient time for cognitive processing. The type of support techniques may vary in different lesson contexts, yet structuring the online experience to build up students critical thinking along the path of cognitive input, processing and output remains an unchanging goal of cognitive support in both face to face and online discussions.

*Cognitive Support: Setting the Context and framing the issue*. This current study utilised the cognitive support of framing an issue and setting the context to help students have a mental structure of an issue as Jonassen (2003) suggests. In this study, students asked to have the exact discussion questions one week before the class. This request for cognitive support was important in building up students' cognitive base. Focus group results indicated that this helped them have a common focus on a complex issue as a

learning community and equipped them to explore in an appropriate direction. Here is a sample of cognitive support by providing background knowledge:

> ..Pan Blue currently focuses on the history of emigration from China and the re-unifying framework within a One China policy…Why independent? Pan Green theorizes the need of sovereignty from the history of Taiwan after the ruling of Holland, Spain, Manchi, Japan and KMT government… The downgrade of the democracy in Hong Kong is another case of Communist China's oppression on capitalistic areas, so why marry China now…

More intuitional feeling-led expression was presented in opinion postings especially after face-to-face class debates. In the initial phase, students presented opinions before posting facts. Cognitive modeling thus became effective in helping their critical thinking.

*Cognitive modeling.* Cognitive modeling is the technique of presenting logical reasoning online as an example of verbalising critical thinking (See p. 110-1 in chapter 4). Modeling was found in this current study helpful in the analysis framework for critical thinking, echoing Taiwanese EFL educators Yu and Chou's (2004) finding of explicit modeling in students' writing and metacognition. One example was my cognitive modeling in the fourth discussion on the weapon purchase in fifth episode of 4.1. Here is a selected excerpt from my response to Sunflower's query that 'If China buys more jets, how shall we respond?'

> …. the 'response' to a big country's threat could involve different approaches: 1) increase our own (military or tech) capability, 2) build alliance with other stronger country, 3) establish alliance with that country's enemy, or 4) submit to that big country's request of our sovereignty.
> Since approaches 1~3 would need help from U.S., buying weapon…was like paying 'insurance premium' for possible war…

My cognitive modeling first explained the definition of 'respond' and placed it within the larger context where Taiwan is situated. Then, I illustrated it in relation to the other key partner in the simulation on the tension of Taiwan Straight. First and second focus group results indicated that students perceived this as helpful in being aware of the analysis. In the fourth episode of the foreign minister's incident, Sunflower, who missed the three-hour class participation reported in a private e-mail to me that she could not understand my cognitive modeling of the teacher's requested analysis format in Environment-Institute-

Behavior. This may hint that background knowledge and sufficient cognitive base may be needed in understanding an issue and taking advantage of the modeling during the cognitive development process.

*Reminding students of examining assumptions & citing sources.* The ground rule for presenting one's own opinion is that of presenting factual information first (citing sources) and then argument (one's own stance). Similar to the assumption check suggested by Marsick and Watkinds (1999) and the questioning techniques by Godinho and Wilson (2004), this current study exercised these techniques in the initial phase of budding, yet students needed reminding repeatedly in the middle phase of blossoming. The following example from the fifth episode illustrates the cognitive reminder:

> As you browse the links, think about
> 1) What is the stance/ opinion of the author?
> 2) What is the assumption of this stance?
> 3) Is the evidence credible? Double checked with other news sources?
> What is the counter opinion?.....your evaluation after logical thinking?
> Before state your stance, present facts or post the extra links you found online to build up your understanding about this complex issue.

In the second focus group, Lavender whose self-selected pseudonym as 'silent girl' pointed out that it was quite important to be reminded to constantly examine the assumptions behind what they read and what they posted. She and Sunflower added that sometimes the information and statistics were heard from TV news, thus they are not always traceable and available for quoting like online news. Therefore, students needed the teacher's constant reminders to examine assumptions and cite sources in posting messages. Students tended to post opinion pieces in a spontaneous way online after reading a question or an online article, without checking the assumptions behind it. The reminder technique for citing sources was to question students' statements by reminding them to examine the logical reasoning based on evidence in the beginning discussion and later challenging on the weakness of students' statements.

*Cognitive challenging.* The challenging technique was found effective in this study to foster students to rethink the validity of argument they put forward and the position they

were opposing. Challenging from me was to primarily request for more evidence to support the stance students argued for. The following excerpt is from the second episode starting with an encouraging comment on the evidence shown by Margarita:

> It is good to hear from XX(Margarita's) debate points for the negative side.
> It is good to see the evidence of the possible damage of *'ecological engineering techniques'..... ....*
> However, more information needed to build argumentation from the group's opinion
> *[Secondly, to our mind, nearly 80% percent of policies are 'near sighted'..]*
> *[which means government just want to get more votes from election]*
> *[After winning the election, these proposals aren't continuing....*
>
> Good, but what proposals?... Not sufficient supporting evidence to reach a conclusion.

Though she did not respond, critical thinking was carried on in the online forum from her teammate Sunflower's message with evidence. Sunflower's further the argument challenged the entire class. Sunflower expressed in the second focus group that even though her teammate did not respond to the challenge, this cognitive reminder alerted students to carefully read diverse sources and critically think through an issue before verbalizing a conclusion online. This result concurs with the British studies by Kneser, Pilkington, and Treasure-Jones (2001) and Pilkington (2001), yet within the CHC context, some students who were challenged turned to silence. An instance of my challenge in discussion two led to more challenge among students such as Sunflower's challenge to Eucalyptus and Palm's challenging flaming of Sunflower in the end of second episode. Eucalyptus did not defend. She went into a long period of silence. The challenging technique was thus effective in the form of questions in fostering critical thinking. For more details on the relationship between questioning and students' postings, please refer to Appendix 13 Researcher's posting numbers and questions. Cognitive challenge was implemented by regular pedagogical practice in encouraging students' critical interactions. The next section will discuss the pedagogical support in this study.

### *5.2.2 Pedagogical Support*

Pedagogical support is also important in an EFL learning environment within a CHC context. According to Gabrielatos (2002), language teaching involves a triangular

combination of teacher's personality, teaching methodology and knowledge of language. Aspects of pedagogical support include explaining new English terminology and abstract concepts, framing the discussion issue in an interesting way, providing small group discussion activities, group presentation of viewpoints, and preparing face-to-face class debates for online critical discussion.

*More Cognitive support for cognitively complex issues.* As the discussion topic increased in complexity, more cognitive and affective support was needed for students to understand an issue. The research result indicated that teachers need to understand students' English level, estimate existing background knowledge, choose texts of suitable level, supplement with hyperlinks for background knowledge, predict problem points, explain new terminology, and set up discussion questions in advance for them to be cognitively prepared. As the discussion reached deeper and more complex issues such as Taiwan value and weapon purchase, students hesitated in crossing the 'wall' in posting their opinions, thus more pedagogical support emerged. The result is similar to Chiu's (2004) notion of three- stage critical thinking development in online discussion: the first cognitive input stage focusing on individual student-text relationship; the second cognitive process stage on face-to-face small group discussion or synchronous online chat to clarify problem points; the third cognitive output stage on asynchronous class online discussion where everyone may post to agree or refute others' opinions with critical reasoning. The majority of students also expressed in the group reflection sheets that after cognitive input from online browsing (student-text relation), they needed a small group discussion to clarify problem points prior to online class discussion. The increasing cognitive challenge to debate on a complex issue with critical thinking thus needs more cognitive support by building up the knowledge base.

*Selection of hyperlinks: By students?* With regard to the question of whether the teacher ought to select the text or hyperlinks for the students, interviews with students indicated that for humanistic topics such as betelnut beauties and the first lady's delegation to the Paralympics, students enjoyed searching online and sharing the hyperlinks they found. Nevertheless, in more complex issues such as the foreign policy of Taiwan and the

weapon purchase issue, students appreciated the teacher's cognitive support in providing hyperlinks of news stories from different perspectives to broaden their vision. In the example of weapon purchase, the hyperlinks offered in advance represented five perspectives of an issue: the ruling party's stance, the opposition party's stance, referendum results, the weapons, and the rival China's stance. In the third episode, students found numerous articles online, ranging from Taiwan's relation with Europe and even Africa, yet not what was needed as cognitive support. Students reported they were lost and even more confused by the online searching result in the first focus group. It would seem that a certain level of cognitive support seems to be important if students' background knowledge of an issue is limited.

*Resetting the topic in conflict*. The technique of resetting the online discussion after confrontation was to wait for student-initiated mediation. After a saturation of similar message content, students expressed in the second focus group that once the momentum was up, a new topic would not stop the intense discussion at once. Daffodil added in an e-mail that the teacher did not need to make efforts to help resolve conflict. I pondered whether and when to reset the topic after conflict. One conflict manager after the middle phase was Rose. She attempted to balance the opposing views in the weapon purchase discussion, right after the first confrontation and in the next discussion right after the Lily-Sunflower confrontation:

> Dear all,
> Well..I don't think we have to feel sorry to have different opinions because everyone can have his or her ones.... (p.114).

Other students started to re-join the discussions after her message. Without the balance, offered by students such as Rose, Sunflower's flaming of Eucalyptus caused a period of silence in the initial phase. Conflict management by students helped lessen the pressure of posting opposing views. This finding of this study thus concurs with that of Vera et al. (2004) in that students may be better conflict managers than the teacher facilitators in resolving conflicts.

*Shifting the discussion questions.* Unlike Jonassen (2001) who perceives shifting topic as the disadvantage of asynchronous online discussions, it was found necessary in this current study to have three to four topics to fully discuss multiple facets of a complex issue. The first discussion may be on the general perception of an issue and its context. Next, the discussion could move on to reasoning its pros and cons, then analysis, evaluation, finally shifting to other possibilities such as personal leaning and other relevant issues evolved from this issue. CHC students did not feel comfortable to share personal choices in public. In discussion one, four students swiftly responded to my third shift of topic to betelnut beauties' salary, yet only one student, Sunflower replied to the fourth shift of topic on whether students would want to be betelnut beauties (See p. 100 in chapter 4). Another example occurred in the weapon purchase, 14 messages replied to the general questions and five on 'China's own weapon purchase' yet no one replied to the shift to 'who to vote for?' in the weapon purchase deal. It seemed that students' replies were negatively related to self-disclosing of their feeling in both hard and soft issues in the CHC context. Pedagogical support for students may involve exploring sub-topics they perceive as interesting and an on which, at the same time, it is acceptable to disclose opinions. As students communicated in English, the language was also a factor involved in students' verbal expression of their critical thinking.

*EFL component.* As the English discussions were contextualised in an EFL class, students needed pedagogical assistance in English expression as suggested by Yang and Chang (2003). In this current study, Sunflower expressed in the second focus group that the teacher let the small groups discuss without monitoring what language students used. It could be suggested then, as Sunflower noted, that the debaters did not receive sufficient support when they argued in English. Forcing the discussion process in English was ideal, yet as Palm suggested in the pre-second focus group interview, the teacher could walk around the class to attend to each group's needs and problem points in English. Synchronous chat text indicated the difficult process for these EFL students (See p.130 in chapter 4) to first discuss the background in Chinese, share viewpoints and clear up problem sentences from the online articles. From time to time they also needed to translate the discussion content into English as they needed to debate or present in English in the following hour. The other reason for the Chinese-English switching may be attributed to

my walking around students in the lab to see if they needed technical or EFL assistance and saw they typed in Chinese. As the Chinese-English model utilised in this study was a gradual one in both language and modes of interactions, a certain degree of first language discussion should be allowed to reduce students' apprehension. This study thus did not investigate the grammatical mistakes, but the way students composed may indicate some factors which influenced student-student interactions and critical thinking online.

However, five of Tan's (2005) language errors online occurred in low volume in this study: 1) misspelling error ('heaven' as 'haven'), 2) new vocabulary: 'value', 'Aegis' (weapon name), 'logistic package', 3) grammatical error: past tense (no verb tense in Chinese), subject-verb consistency (he reports), lower-case typing (i think…), 4) abbreviation (TW for Taiwan, 'coz' for because…) , and 5) the use of emoticons --- emotional icons =.='' or (:l ) at disagreement). There were Netiquette issues like emphasizing and shouting, both in capitalization. As there is no lower-case in Chinese, the shouting effect was not interpreted as serious by some of the group. In Sunflower's capitalised flaming, the one she flamed ended up with a silence lasting more than a month. As Tan (2005) found many English language errors (capitalization) are actually adolescents' cyber identity developed through fast typing and creativity, which Holkner (2002) perceives as a low formality of learning environment in cyber culture. The EFL component was thus an invisible veil when students interacted both in face-to-face and online environments. The next section of this chapter will illustrate the affective support needed in facilitating humanistic emotions in online discussions.

### *5.2.3 Affective Support*

Affective support refers to the humanistic exchanges, emotional expression and social networks in participants' experience. Similar to Salmon's (2002) emphasis on the affective objective of motivation and online socialisation, the current study found affective support an important factor in encouraging students of CHC background to verbalise their critical thinking in public. This study furthered Salmon's affective objective by providing the emotional and humanistic support suited in the CHC context to build up their confidence they lack in the face-to-face learning environment to express themselves. An example was

online overt, verbal support in public such as Margarita's message 'I have to give a big hand to Daffodil because her words are knocking at my heart'. I offered affective support in face-to-face environment by smiling to them, talking to them, encouraging their participation, and verbally thanking their contribution. Several techniques utilised in this study were of value in eliciting CHC students' affection and motivation in participating in online discussions: mobilizing the quiet ones, comforting the challenged ones (especially females), and assisting challengers.

*Mobilising the quiet ones*. Face-to-face conversations and private e-mail contact with individual students also invited some quiet students such as silent girl Lavender and smiling Rose. Salmon (2002) speaking of the online environment and Towns, Kreke, and Fields (2000) representing the face-to-face environment, encourage the quiet ones to participate. This was a major achievement in this study. I explored ways to build up relationships with students and communicated with all students to elicit the quiet ones' participation. Quiet Rose replied to my e-mail in week 11, overcoming her fear and crossing the cultural and affective wall to participate online. Unlike outspoken Sunflower and Daffodil, Rose started her participation late, yet as a late coming participant, she blossomed beautifully to be the one with the most postings in this study. The 'budding' stage required cognitive and affective support for students, yet prepared the upcoming stage of critical blossoming.

*Comforting the challenged female students.* Teachers need to provide special affective support for female students who are challenged in the online discussions. Unlike conclusions of Vera et al. (2004), whose study was located in a western culture, female students in this current study under a CHC context were found to depend more on non-verbal rather than verbal communication in the face-to-face learning environment. Female students of CHC influence needed more face-to-face comfort and online affirmation as affective support in the circumstance of challenging. The focus for female students was the feelings of not being valued and being hurt. The healing process was longer. Eucalyptus took more than a month. Even the outspoken and the earliest participant of all online discussions, Daffodil, needed sixteen days of conflict avoiding silence to recover from the flaming and confrontation. Her next message was the twenty-ninth

message of the next discussion written as a defense to Sunflower's questioning. Female students needed classmates' public support through agreeing messages and face-to-face affection by smilingly acknowledging their being and contribution. Teacher's eye-contact, verbal support and hugging were effective to 'heal' female students' affective wounds and help them re-build confidence and a sense of security. Focus group results indicate that when they feel they are worthy and welcome by certain period of observing silence, most returned to the online discussions.

*Helping male students after confrontation.* One male student in the study needed more affective support in conflict resolution than his female peers. The second flamer Palm stopped posting online after his regretted flaming of Sunflower, who did not come to this class for three weeks. His flaming message was his first and last posting in the class. As Vera, et al. (2004) found that boys need more intervention in conflict resolution, Palm did not post any more after the flaming in week ten. However, in a pre-second focus group meeting in week thirteen, he disclosed his sense of guilt and the need of help to resolve the grudge at openly challenging Sunflower in an online discussion. A sense of guilt at crossing the CHC boundary caused social alienation and the struggle of conflict-avoiding silence both for challengers and the challenged. After my mediating and encouragement, he wrote an e-mail to Sunflower for apology, and received a swift reply to clarify that her absence was due to a personal issue, not his flaming message. Resolving the conflict by e-mailing through the problem eased Palm and he had the courage to verbalise his opinion in face-to-face class again the next week. Once a male student regains confidence, he may participate in class interaction again sooner than his female counterparts. Teachers need to share students' concerns, feelings and emotions described within the interpersonal relationships among the online members and comfort the challenged ones.

*Assisting challengers: A leap in crossing CHC context*. In addition to comforting the challenged students, teachers also need to assist the challengers as they leap through the CHC boundary. Rebuilding a sense of orientation and social acceptance are important for them. Violating the CHC norm to challenge others led to a sense of 'otherness' which needs to be dealt with. While students challenged others in this research study, they encountered cognitive challenging as well as affective discomfort, which was named

'otherness' by an active challenger Sunflower. She disclosed in an e-mail to I that the difficulty of challenging was not the fear of being challenged back or losing face, but that of emotional alienation and class culture that bound people. While others fostered student-student relationships in other compulsory courses, she needed affective support. Here is what Sunflower divulged in an e-mail message on how she felt at challenging others:

> I never feel weird or afraid of those challenged me or those I challenged when I went to class. I was simply giving my opinions without even noticing who I was 'challenging'. I think it's great to have people 'challenging' me, so that I will have the chance to think over again and find out the weak points or wrong points of my previous messages. Isn't it the best way for people to learn? The only thing I was worried about is that should I be so active in 'other people's' class.

The 'otherness' demands emotional support and comradeship for a non-CHC student's dilemma. Teachers, thus need to attend to challenger students' emotional status in private as friends of those being challenged may fight back. More face-to-face and private e-mail contact to encourage the challenge online was important to help these students overcome their interpersonal pressure back in the face-to-face class. They may need to wait for the class to accept them and normalise the conflict online.

To sum up, teachers need to offer affective support and encouragement during the cognitive process. Additional attention and individual emotional support may be needed for those less verbal students; female students who were challenged, male students involved in confrontation, as well as all challengers. Fostering critical thinking in a CHC context was a liberating yet painful process, yet with teacher's affective support and strategies, students could successfully break the CHC cognitive bondage and affective tensions to verbalise critical thinking. As students and the teacher underwent the experience of expressing their critical thinking online, some technical support was needed. The next section will address the technical support involved.

### *5.2.4 Technical Support*

Of equal importance to the cognitive and affective support, is the technical support offered as in a user-friendly environment. Technical support here is needed for both the teachers and students to be familiar with the platform of the online forum.

*Technical setup.* The technical setup started with registering a class website on E-course from the Computing Center. Teachers needed to submit an application form downloadable from the campus website. Once it was completed, the next step was converting materials to http and uploading on the class website. The entry rule of the class website could be set for official students, or available to any guests. The teacher could assign an experienced assistant as the teaching assistant. The setup of small groups could be in a group of five or six according to the initial grouping in the face-to-face classroom for term project or weekly discussions. This promoted collaborative learning in small group chat or group bulletin. Other setups included choosing user-friendly, visually pleasing web design in content pages and using easy-to-navigate software taking a new role as a facilitator instead of a professor.

*Workshop provided for novice teachers.* The school provided workshops that lasted several weekends to help teachers learn how to use the E-course system as the platform and to integrate it into the class curriculum. I had visited the teacher several times in her office to teach her how to post a question in the E-course environment and wrote down a note for instructions, yet after practice and discussion, she still used her comfortable Word-document on the class screen and asked students to search information on academic search engines like Lexus-Nexus, rather than using the existing hyperlinks selected and posted by I on E-course class website after discussion with her. The learning curve on technology is the technical transition.

*Reserving the lab & online FAQ.* Other than the workshops for teachers' technical preparation, some helpful methods to assist both teachers and students to cross the technical boundary included arranging lab tutoring for the students to help them to become familiar with the system, a lab session reservation for the class to discuss online, and a section of Frequently Asked Questions online about problem solving such as forgetting

login names and passwords. Some students chose to sit with their group mates in the lab and shared a computer station to help out one another in logging into the campus E-course platform, browsing within the system, understanding the background knowledge of texts and uploading/downloading texts from the Internet.

*Minor technical support.* Only a few students did not grow the habit of logging on and sent e-mails indicating that they were not able to upload their homework in time or forgetting their passwords. Technical staff's e-mail answers or presence in the lab was helpful in solving technical problems in time. Above all, in-class screen demonstrations of the online discussion questions was an effective way to blend face-to-face learning with the online discussion forum and assisted in crossing the technical gap by inviting the computer interface to the classroom and focusing on the key issues by the hyperlinks posted by me.

To sum up, a teacher needs to provide students with cognitive support in modeling and challenging, pedagogical support in cognitive input, context setup, topic shifting, with timely EFL assistance, affective support in mobalising quiet students and comforting after flaming, as well as technical support in setup, demonstration and administrating issues. The affective support is important for CHC students' face-to-face interactions and online discussions. The following part will focus on implementation of the shepherd's model of facilitation.

## 5.3 Student-Student Online Interactions

This section of the chapter addresses the second half of the overarching research question; exploring student-student interactions. With a focus on how students explored the CHC boundary of social harmony, the selected student-student online phenomena here includes silences, monologues, challenge messages, flaming, interposing messages and group dynamics within groups, between groups and classes.

### *5.3.1 Silences*

As one of the major characteristics of CHC is silence, it is worthwhile differentiating different silences and discussing the way online interactions helped CHC students to

verbalise critical thinking behind a 'veil' as Merryfield (2003) suggests. While literature attributed students' silence to participation issues (Bullen, 2001; Hardy & Scheufele, 2005), teacher's facilitation (Huang, 2001; Winograd, 2001), or technical issues (Murphy & Coleman, 2004), this study furthered the research (McLoughlin, 2000; Merryfield, 2003) on cultural factors in online communication by exploring and categorising silences relevant to critical thinking. This study observed three types of silences which were influential to CHC students' critical thinking development: no-idea silence, germinating silence and conflict-avoiding silence.

The following is a table (Table 5.1) that describes types of silences and the support needed accordingly:

Table 5.1

Types of Silences and Support Needed

| Types of Silences | Support Needed |
|---|---|
| No-idea silence | Explanation, clarification and examples |
| Germinating silence | Affective support with patience<br>More cognitive input |
| Conflict-avoiding silence | Individually caring those in conflict<br>Face-to-face encouraging for furthering discussion |

There first type of silence is a no-idea silence, which is simply a response to confusion or lack of understanding. As a quiet student who called herself 'silent girl', Lavender broke the more-than-two-week silence and asked online what 'Taiwan value' was the first message in this discussion. This indicated a no-idea silence. The rest of the class remained silent until the face-to-face debate. In the second focus group, Lavender suggested that cognitive support was needed, which indicates building up a cognitive base and bridging the cognitive gap are prerequisite in critical thinking discussions. The cognitive support needed in this stage was an explanation of the terminology, an interpretation, and an example. After two messages from I explained the term and gave concrete examples, other students started to join in the discussion.

The second type of silence was a germinating silence during the cognitive processing stage when ideas were in the process of budding and brewing. Quiet students needed this type of silence before they were able to understand an issue, analyze and cognitively address their evaluation of an issue, thus expressing their own opinions. Rose was a typical example of quiet students who later verbally engaged in discussion after crossing this stage of germinating silence. She broke her silence in week ten after I had personal e-mail contacts with her and later she turned to be an active participant. The support needed in this germinating silence was predominantly affective support to encourage them to express their opinions online. The effective support found in this research included smiling, patting

students' shoulders and verbal elicitation. Echoing Katafiasz's (2003) suggestion, this research found patience on the teacher's part quite important to wait for students' confidence. As quiet CHC students form their opinions, they also need to wait for the timing when the environment is perceived supportive enough before they begin to perform on the stage. A late budding Rose's long germinating silence signified the cognitive processing needed by quiet students to go through privately and independently. Unlike them, their talkative counterparts like Sunflower processed thoughts by speaking out the ideas at the same time either face-to-face or online. Germinating silence may partially explain silent or lurking ones in the CHC class who did not swiftly contribute to online discussions, but accumulated socially constructed knowledge in their ways.

The third type of silence is the conflict-avoiding silence, which aims to avoid voicing different ideas or being involved in others' conflicts for cultural reasons. Four students of the seven participants in the first focus group expressed that they would not post their messages directly below a message which expressed opposing opinions. What they would do instead was to reply to a much earlier message of the same stance or simply wait for a message with a similar opinion and post below it. Rose chose not to confront Sunflower, but replied to the message prior to Sunflower in discussion six. The justification was that posting was of the same position as Rose felt, while Sunflower's stance was an opposing one. This may imply that some CHC students felt more comfortable commenting on similar stances, rather than confronting different ones.

When asked during the first focus group what they would do in case of other students' confrontation, five out of seven students indicated that they would avoid commenting on either side. One more active student indicated that she would verbalise her support for one side at a later stage, but would not further the discussion at that moment. In other words, the majority of early online participants would simply remain silent at others' confrontation, while some would maintain only temporary silence and start to post as the atmosphere was perceived more accepting. One reason was the possible challenge in the later stage. An example was Sunflower in discussion six. She challenged Daffodil's message in discussion four. The permanent retrieval characteristic of Internet medium

posed a threat to CHC students who were not sure whether to voice their support for one side in an online confrontation. The cognitive support needed here was two-fold: individual support from the teacher for both challenged ones and challengers in order to allow them to develop thinking along the critical dialogues. Looking for reasons why students dare not voice opinions after others' conflict may help teachers better encourage online participation. The next section will illustrate monologues.

### *5.3.2 Monologues*

Monologues in this research study are not restricted to messages that did not reply to other messages, but in a stricter social-constructivist sense refer to online utterances, which did not intend to elicit interactions with people and their ideas. Rather, they did not successfully invite responses or did not listen to others' ongoing voices. The difference between monologues and dialogues is that monologue authors did not log online to see whether other classmates were interested in their postings, while in dialogues authors logged online to check whether their contribution had been acknowledged or led the discussion to a new direction.

Monologues in this study included:

- Composing a response to the teacher's initial question without reading others' postings
- Replying a posting much earlier without following the current discussion

A monologue was composed without intending to read others' messages afterwards. They often occurred in reply to the teacher's initial question in lack of commitment. A threshold of students' commitment in reading online messages was the teacher's change of attitude. She became strongly dissatisfied in the face-to-face class presentation about students' lack of previewing and understanding of online information crucial to class discussion. After that incident in the face-to-face class session, students started to recognize the helpfulness of online hyperlinks posted by me. New messages were posted almost every day. One implication of this was that online learning needed to be closely interrelated to the face-to-face class.

Another reason for self-expressing monologues may be attributed to the technical factor. Once there are more than ten messages on the online discussion bulletin board on the E-course platform, those who clicked on the online discussion bulletin board would automatically see the posting eleven on of the second page of updates. An incident which illustrates this occurred when a late comer composed and posted thirty-one replies to Rose's posting thirteen, which was Rose's first of three. This message did not follow the 'discussion flow' in a non-threaded discussion. It was intended to gain extra points for posting online. As technical problems could be solved by technical solutions, adding the feature of threaded discussion allows more than one sub-discussion at a time for students' interest. Also, the feature of displaying all postings' titles in a single screen may help late participants understand where the discussion came from and where it is going now to avoid monologues. While technical aspects are influential, students' commitment in reading others' messages often caused monologues. An opposite case of lack of commitment was in the challenge messages, which will be introduced in the following section.

### *5.3.3 Challenging Messages*

Challenging messages posed opposing viewpoints or requested clarification in a challenging tone. Since opposing viewpoints tend to be suppressed in CHC classrooms, students who dare to violate the cultural norm tended to argue for a viewpoint by posting challenging messages. These messages were cognitively and affectively more difficult than messages of agreement. As presented in 4.3, students double checked the evidence mostly in 'cognitive dissonance', espoused first by Festinger (1957) that the information contrary to one's existing opinions is the source of motivation to seek information which support the choice. The example of Sunflower defending her teammate and providing evidence in discussion two minimised psychologically uncomfortable feelings in the inconsistency of information and opinions.

The initial occurrence of challenging caused discomfort and cultural imbalance as the first focus group result indicated. However, with my challenge modeling along with affective support in the first two discussions, challenges extended from class debates toward public

conflicting online. The following examples illustrate glimpse of students' challenge. One is Sunflower challenging my message on 'How about China's own weapon purchase?'

> smiling Jean says>As China bought more jets, shall we respond or not?
> What do you mean by 'respond?' Do you mean should we also buy more weapons to protect ourselves? (p 108)

The other example is Lily's challenge of Daffodil in the same discussion:

> *Daffodil say:*
> *China never ruled us, .. We're already independent.*
> If Taiwan is independent, why can't we join the United Nation?.... (p.109)

As challenging messages became more and more prevalent online, critical thinking was exercised in cross-examination debating format. Once the critical community culture was recognized, the CHC mentality slowly lost its grip on some students and the cognitive spin influenced other students in multiple members' discussion on an aspect of an issue. Occasionally students used unacceptable criticism which led to personal attacks in flaming.

### *5.3.4 Flaming Messages*

Flaming is the online address that severely criticizes a previous message with an implicit tone hinting personal attack (Salmon, 2002, 2003). Unlike Salmon (2002), I did not set out to prevent flaming messages as it is not common in CHC context. Three cases were observed during this online study. The following is an edited example of Sunflower's flaming to Eucalyptus in the discussion of Taiwan value:

> Eucalyptus say: Human and other creatures need to rely on nature and survive…
> Do you mean for our SURVIVAL or our DESIRE?

In response to this capitalised shouting of flaming above, Palm followed up with criticism of the emotional challenge of Sunflower for her face-to-face debate gesture as follows:

> I disagree with this point……
> PS…people don't have to put their heads between the gesture of the quotation mark to emphasize the word…^^'…

Similar to the finding of Vera et al. (2004), the unresolved tension in face-to-face debate carried on to online discussion in flaming. However, flaming was found related to the face-to-face debate and tense interpersonal relationship, especially when an emotional criticism message was not dealt with on the spot. Despite the use of emoticons by …^^'.., the online flaming changed the atmosphere and hindered others' posting to avoid the conflict. The next section will introduce interposing messages.

### *5.3.5 Interposing Messages: Post-Conflict Interaction Pattern*

This section aims to discuss the unique type of messages which were posted after the conflict point and interposed within the ongoing discussion for cultural reasons. Participants started to comment on one side of the confrontation after the conflict tension seemed to be released to a balance point. One example was posting 31 responding to posting 13 from Rose when the Lily-Daffodil confrontation was over in discussion five. This suggests that CHC students may fear being held responsible for dynamically becoming involved in others' online conflicts during the discussion process. Students prefer to wait for the right timing. Students perception of the atmosphere as supportive is a factor in CHC students' online participation. The next section attempts to explore the interrelationship within groups, between groups and between two classes online.

### *5.3.6 Group Dynamics*

One of the factors that influenced CHC students' willingness to verbalise different opinions was the group dynamics: inter-class and intra-class student-student relationships in the online environment. The face-to-face emotional support and peer interrelationship in a CHC context may foster online socialising interactions and at the same time hinder critical expressions online. Early cross-referencing patterns emerged among students who were already close friends, often in group-chained interactions following face-to-face small group leaders. The CHC wall of silence was perceived breakable by the seven students

who participated in discussion one, yet it remained as a cement wall for the remaining 40 students of the class as they observed some more active classmates engaging in critical discussion with I and one another.

The following section presents particular concerns with CHC students' group pattern in critical thinking in the following table (Table 5.2).

Table 5.2

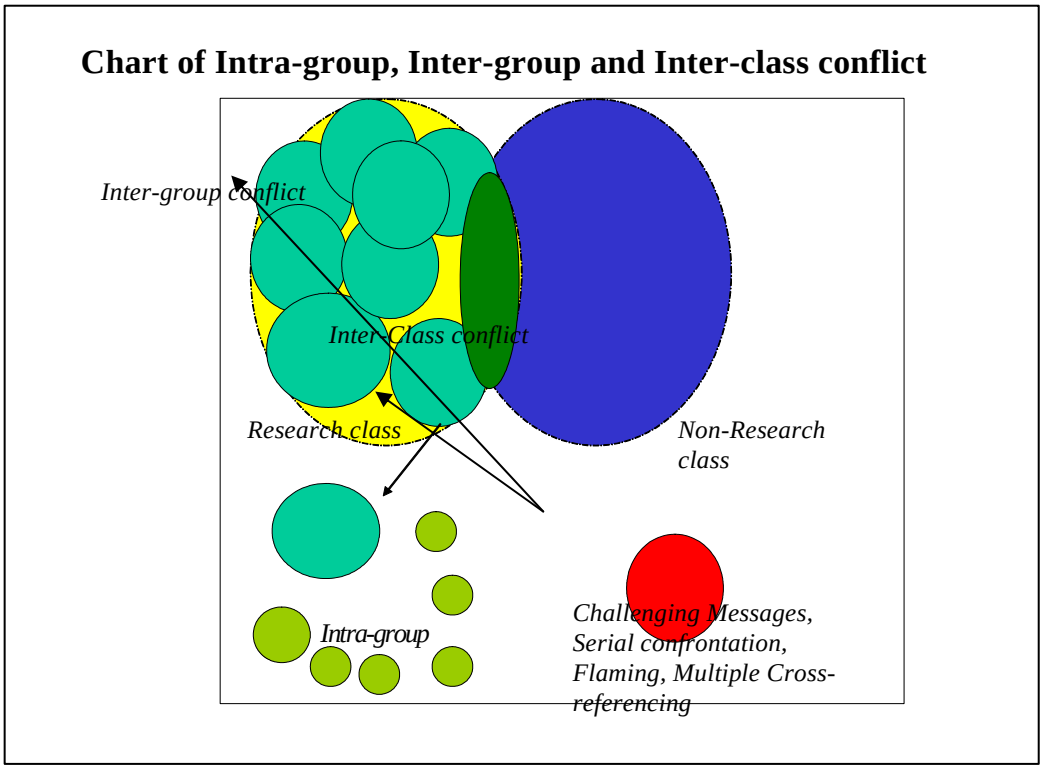
Inter-group, Intra-group, Inter-class Interactions

| Interaction | Betelnut | Taiwan value | FM | Mm Chiang | Weapon Purchase | 1st Lady | Ex-Pres |
|---|---|---|---|---|---|---|---|
| Inter-group Agreement | 1 | 2 | | 3 | 6 | 2 | |
| Inter-group Disagreement | 1 | 5 | | | | 3 | |
| Intra-group Disagreement | | | | 3 | | | |
| Group-chained Interactions | 3 | 6 | 3 | 1 | 1 | 1 | |
| Inter-class Disagreement | | | | | 4 | 5 | |

The inter-group agreement within the same class was prevalent, which suggests that CHC students in this study preferred to agree rather than disagree and challenge in public. The inter-group challenge also occurred, especially when there was a class debate in face-to-face class sessions. An intra-group challenge, however, occurred once by three group mates, possibly because of the group mates' tendency to reach consensus after face-to-face small group discussions. Group-chained interactions, on the other hand, became less popular as individuals chose their online interaction pattern, not following one another in online discussion. Finally, the inter-class challenge changed the CHC culture boundary with sharp critical evaluation of the messages. The following figure illustrates the group dynamics of conflict between groups and classes:

Figure 5.1

Intra-group, Inter-group and Inter-class Conflict




In the initial stage, collectivist practice in face-to-face small group discussion was a more favourable mode of class participation. As students shared viewpoints in face-to-face small group discussions, the intra-group conflict was cleared when they orally presented in the class. In the second, fifth and sixth discussions, two sides in the face-to-face debates led to inter-group disagreement and even inter-class discussion. Students' critical thinking matured as they shifted from the collective voice to individual critical participation. After discussing students' critical thinking in the student-student interactions evolved in silences, monologues, challenging, flaming, interposing messages and group dynamics in an attempt to respond to the overarching research question, the following section presents the discussion on the role of shepherd facilitator.

## 5.4 Shepherd Facilitator

This section attempts to address the second research question in this study:

- How does a teacher facilitate Taiwanese EFL students' interactions for critical thinking?

The way a teacher facilitates students' critical interactions is related to how a teacher establishes teacher-student relationships (Kao & Chen, 2003). The role of the facilitator was found helpful for students in crossing the CHC cultural boundary of silence and harmony to verbalise critical thinking (See 4.2.2 & 4.2.3). The relationship of the teacher with the students was important in online discussion in two ways: it first influenced students' initial motivation to cross the first step of participation and later enhanced students' capability to take alternative viewpoints or challenge as a further step of critical participation. The teacher-student relationship involves the shepherd leadership skills in encouraging and mobilising students to verbalise critical thinking. There was a pattern in this research that I led student leaders' participation and they, in turn, drew others to join in the online discussions.

The following was an analysis of the leadership pattern from the first online discussion. In discussion one, I started with an interesting question to attract attention and cognitive modeling on a range of alternative perspectives. Interest arousal and a clear way of discussion direction in the modeling were effective in leading the sheep. The same day of posting, a student responded. Three days after, I called the three earliest participants by their first names in Chinese to encourage them and asked all groups to post alternative answers in their face-to-face group discussion as a way to seek the lost sheep. The efforts in calling out to student leaders by name and encouraging them to post critical thinking were part of the discipleship. One leader soon posted the group answer and I followed up with a new question based on their opinion three days after. The cycle of shepherd leadership started with seven student leaders in discussion one, which extended to twelve leaders in discussion two and eventually to a total of 37. The teacher and researcher need

to provide affective support first in face-to-face, then in online environments with continuous cognitive input. Listening to their voice was a strategy to invite them to listen to the teacher's voice in the online discussion. Building up the shepherd-sheep relationship in the face-to-face environment was the prerequisite for CHC students to cross over affective barriers of silence in preparing for verbalising critical thinking in online discussions (See 4.2.1).

In this study, some of the early postings were recognized from small group leaders of the class. While it is useful in establishing relationships with a few students and inviting their participation, it is unlikely to apply to a large class size due to the time-constraints of teaching and preparation. McCormick and Davenport (2004) suggest searching for the leaders among the sheep and establishing relationships with them first, then they will identify with the teacher's vision and follow the teacher's example. Applied in a classroom context, establishing a relationship with students included conversing with them, and caring for their well-being and social lives. Once the teacher-student rapport was established, they were involved in the cognitive tasks online. The example of these leaders' will draw many more to follow. I found out that they were online participants in the early stage. This implication suggests that face-to-face interactions between researcher and students may influence students' motivation for online participation. Please refer to Appendix 14 Most Active Online Participants' Participation Records for most active online participants' number of logins, browsing, asynchronous postings and synchronous usage.

While the most active twelve students differed in the number of logins, browsing and discussions in which they participated, contribution to asynchronous postings and synchronous chatting, they were considered leaders in online discussions in student-student interactions. As Salmon (2002) stresses, socialising is a major area of facilitating online interactions following initial motivation and introduction. The relationships with students were validated as an important factor of students' participation as some students directed their messages to I, rather than the class. The following is the illustration of the techniques of shepherd facilitator.

### *5.4.1 Addressing by students' first names*

As McCormick and Davenport (2004) note, the technique of addressing students by first name was effective in building up relationships. In this study, it was I-student relationship and it drew more interactions. Two examples explained how important being addressed by first names was to the relationships. In the third posting from Daffodil, she addressed I and also gave her first name both in Chinese and English. She started with 'I'm XXX or you can call me XX!' before answering the second question raised by my question on 'how much is earned?' A subsequent posting from Daffodil cited Margarita and provided a different version of the story, with the evidence from a news article. The critical thinking development started its 'budding' phase as Daffodil had the courage to mildly point out the differences in salary. This inter-group disagreeing was a step crossing the cultural boundary of CHC harmony maintenance in public. I-student shepherding relationship begins with talking to students personally and asked their names. The next section will discuss the second technique of shepherding: directing the path.

### *5.4.2 Directing the path*

After calling students by names, I needed to provide feedback and direct students to the right path when students started to engage in online discussions in times. Among all the facilitating techniques suggested by Kao and Chen (2003) in first language context, five techniques were frequently used: supporting, suggesting, interpreting, linking, and emphasizing. Each will be explained in a paragraph as follows:

*Supporting*. The supporting technique of offering positive reinforcement of students' sharing was perceived highly effective and affective in encouraging students to express their opinions. The teacher's affective supporting, facial expression and emotional responses sent non-verbal cues of liking or disliking students, and impacted students' perception of their opinions, which in turn also encouraged or discouraged other students' willingness and confidence in verbalising their mental process. One issue that the students in the first focus group raised was that of the teacher's own cognitive inflexibility, obviously leaning towards a certain stance when asking open-ended questions. An

example occurred when the teacher questioned three groups (in face to face) and did not smile until the presence of a desired response about the foreign minister's improper wording. An obstacle was the CHC teacher authority image on the podium in the face to face classroom.

*Suggesting.* The suggesting: technique of pointing to other viewpoints was not mentioned particularly in students' responses. An example was the suggestion to balance between construction & nature by I and later to deploy both weapon purchase and peace talk by an online poster. This may broaden students' perspectives and provide possible alternative options in solving complex problems.

*Interpreting.* The next technique was interpreting in explaining the stance, terminology, or the background. An example was my interpretation on the phrase 'Taiwan value' used by the teacher in the first posting. Students expressed this as highly important to explain and clarify the key phrase first, or else it would be unlikely for them to engage in any to-the-point message composing, not to mention discussion with critical thinking. Without clarification, students may refer to different things while quoting the same items, thus interpreting as found one of the most essential role that a teacher ought to play.

*Linking.* The technique of linking different students' ideas was a common practice for smooth flow of the online discussion, not discussed much in the focus group meeting. Nevertheless, I used linking to connect Sunflower's challenge 'How about China's own weapon purchase?' with what was discussed in the face-to-face debate in weapon purchase discussion: 'Since approaches 1~3 would need help from U.S., buying weapon as XX said last Monday was like paying an 'insurance premium' for possible future war'.

*Emphasizing.* The technique of emphasizing in making efforts to stress a particularly different reference works or thinking pattern was perceived influential only to online posters of the same class. The emphasizing technique was used in discussing the case of whether Madame Chiang Fan-liang was a modern role model for Chinese females and how to prevent the possible downgrading of communist China of the first lady of Taiwan in the Para Olympics was said to not cause too much emotional impact from the eyes of online posters in the other class. However, some questioned the technique of

emphasis when it was used to persuade others to a certain viewpoint. After discussing the effective facilitating techniques, let us move on to one of the catalytic aspects of shepherd leadership: discipleship in establishing relationships with leaders.

### *5.4.3 Establishing Relationships with Leader Students*

Establishing a relationship with Sunflower was one of the most nourishing ones for I as she was the most experienced online actor and demonstrated critical thinking modeling in class. Once Leader students recognised the value of the teacher through the relationship, they were influenced to exercise critical participation online. Some techniques utilised to establish a relationship with leaders were

- talking to them after class
- smiling to the students who came for questions
- praising their online contribution in E-course
- encouraging individuals for their online postings in face-to-face context
- clapping hands for and paddling on debaters' shoulders for debate performance
- smiling to presenting students during and after presentation
- verbally inviting the presenting groups to post their brilliant ideas online
- e-mailing to all the hyperlinks for the next round of discussion in advance
- e-mail existing online leaders for caring
- e-mailing to groups for the discussion topic of the week for extra marks, etc…)

Cultivating a relationship with leaders was an effective technique to trigger more contribution from them and other group members to post online. Here is Sunflower's e-mail telling the story from a senior 'outsider' to be a committed participant:

> … I wouldn't be so participative if it wasn't for you. I usually feel like an outsider while I went to classes not of my grade; but this time, because of all those nice emails you sent, I had the courage and confidence to post my opinions on the e-course board. There are no words that can express my appreciations…

I had numerous e-mail contacts with Sunflower on 'Are you really 23?' for betelnut beauties, weapon purchase fraud, First Lady, etc... Sunflower started to establish a closer rapport with I and as a re-taker of the course, she was not part of the class, yet during the sessions when she was absent, I continued to e-mail her to care about her situation and encourage her to post online. She was still the most active student online even during the three weeks period of absence in the face-to-face learning environment. While the relationship of I with the leaders was crucial, existing student-student relationships also played an important role in whether or not other quiet students chose to post online. As a result, seeking the quiet ones was an important issue.

*Calling out to silent ones for participation.* In addition to exercising leadership and discipleship, 'shepherds' also search for the lost sheep (McCormick & Davenport, 2004). This involves reaching out to them individually. After knowing their names and establishing relationships as mentioned, I often succeeded in encouraging some new participants who broke the silence while other quieter students would smile back without contributing online. Quiet students like Peppermint, Peach, Jasmine and Rosemary were sheep not far from crossing the silence zone as they had private conversations with I during the break time. Effective strategies used in this research to encourage online participation from this type of quasi-responsive students included

- smiling to the students who come near you in an informal setting of a face-to-face context
- continuing to have dialogues with them first on non-discussion matters to show your care, then asking their opinions on the discussion questions, eventually praising the value of the opinions and encouraging them to contribute online
- following up on those who show interests to post online with e-mailing to encourage them to share online with some evidence to support a claim

The role of shepherd facilitator is to care for the students and guide them with cognitive and affective support. Major techniques are addressing students by first names (either in English or in first language, whichever shortens the teacher-student distance), showing

them the path by a variety of techniques including supporting and suggesting, building relationship with leaders and reaching out to the silent ones. These tasks may be trivial in the teachers' eyes, but without sending and receiving nearly a hundred e-mails and spending face-to-face class time with students during the semester, I would not be able to invite 37 students to participate in online discussions voluntarily.

One key point of the shepherd facilitator model is the balance between not desiring to interact with students after setting the texts online and mobilising those who do not show an interest in the face-to-face learning environment. Constant caring to students despite their scores or online participation rate is a characteristic of shepherd facilitator especially in face-to-face environment. Once the shepherd image is established, the cognitive modeling of challenge would not be considered as formidable as it is traditionally regarded in a CHC context.

## 5.5 Models of Interactions

This section attempts to address the third research question about models which may better foster critical thinking development:

- How do different modes of interactions impact on students' interactions and critical thinking?

This action research study utilised different combinations of face-to-face models and online modes in exploring combinations of models (See Table 3. 2 Modes of Interactions) based on students' responses in two pre-focus group questions and two focus group interviews. Overall, students preferred a range of mixture of face-to-face models and online modes of interaction. However, asynchronous mode of online discussion was cited as an influential mode in fostering critical thinking. Daffodil wrote in the E-course Class Bulletin Board that in addition to helping focusing on the topic, asynchronous mode promotes thinking and discussing:

> … thinking then writing compares to thinking then speaking in English is usually easier for us. .. while we type it down, we have a second chance to review what we

> just typed and reorganize it again if the idea is not clear..
> third, we have the chance to discuss with EVERYONE in the class..
> we get to know all the ideas in our mind by sharing online
> it's not easy for us to do that in class with small groups..

Daffodil illustrates the functionality of asynchronous mode in creating wait time for critical thinking on an issue and checking one's thinking before reorganizing one's argument and typing it down. The opportunity to discuss with 'everyone' in the class was desired, for Daffodil's English level was advanced, but her group mates' English level is far below hers, thus engaging in critical discussions in face-to-face small group learning environment was very unlikely in her case. Cinnamon's group and Sunflower's group had more mates of advanced level and more lively group discussions, thus did not have such needs to go online for critical discussions. Critical discussion requires at least two parties whose cognitive development is mature enough and whose motivation is strong enough to voluntarily converse thoughts openly and critically. If face-to-face discussion partners are required to do so in a critical way to confront with different ideas, it may involve a difficult stage of affective pains in crossing cultural boundary in disagreeing someone in public. Asynchronous mode in this sense serves as the most suitable means for critical discussion in dealing with subtle cultural context, as those who confront with each other do not need to look at each other face-to-face.

Within the online environment, a majority of students favored an asynchronous mode over synchronous mode of online interaction according to the group reflection sheets. As cognitive readiness varied between group mates, in-class synchronous chat in English was not feasible in the critical-thinking-oriented study. In the real time chat text, Chinese was mixed with English, yet it assisted students in swiftly translating their mental processing in Chinese to verbal text format in English. Time lapse also disconnected the question-asking and answering, thus some logged off to discuss face-to-face with group mates sitting beside. As the main purpose of synchronous real time chat was to share background knowledge and clarify problem points, synchronous mode of interactions served to help quiet ones to talk. However, in terms of fostering critical thinking, synchronous mode does

not provide the delayed time needed for reading articles, reflection, research, and composing critical messages.

Face-to-face small group discussion, however, was effective in the initial discussion stage preparing for discussion. According to the pre-first-focus-group reflection sheet, face-to-face small group discussion mode provides peer support, English comprehension and translation support, emotional affiliation, sense of security in groups, immediacy that helped clear up question points in time and develop interactions as well as non-verbal communication signals. Tulip was a less verbal student in face-to-face learning environment. She argues for face-to-face small group discussion over other models:

> In my opinion, I think f2f may be an important way. Because sometime it is difficult to express our own meaning in English. Besides, f2f can easily helps us understand what others meaning and we also can express our meanings through gestures.

EFL component plays an important role in the process of engaging in critical discussion. Better English comprehension is thus a cognitive and language basis for lower-intermediate students in exercising critical thinking. Face-to-face small group discussions built up the cognitive foundation and affective confidence to help Tulip to follow group members to engage in four episodes of online discussions.

Each of the other face-to-face models of interaction had its advantages: randomly chosen group presentation, class debate by six students, class debate by six groups and semi-debate group presentations by all eight groups. In the model of non-threatening group presentation, not all groups shared their opinions and not much critical interaction was observed. With the call for equal participation and critical thinking in mind, debate by six students was deployed. Please refer to Figure 3.1 Class Debate Model by Six Students. As only six persons were nominated (by others) to debate, the class atmosphere was tense and the participation was low. This format to require confrontation in debate was repulsed by many students for lack of support despite its effect in pushing verbalising critical thinking.

Palm in the pre-second-focus-group questioned the teacher's motivation in causing verbal confrontation in public and emotional pain in crossing cultural boundary.

To compensate for the lack of equal critical participation, the teacher developed a group-supported debate. See Figure 3.2 Group-Supported Model of Class Debate. With only twenty minutes before the debate, appointed debaters needed sufficient English proficiency to translate the group ideas of intense Chinese discussion into English. This mode stimulated critical thinking within short time with immediate student-student support and increased non-debaters' participation, yet not all groups participated in this modified debate. While being effective, any debate mode could easily cause repulsion that Palm experienced. Therefore, it may be suggested to first use the modified semi-debate presentation by all eight groups before using this one. See Figure 3.3 Semi-Debate Model by All Eight Groups. With the aim of collaborative critical thinking, the learning task was for each group to present own ideas and criticise the previous group. It was the less threatening in atmosphere, yet more repetitive in its summary-like group presentation on the same factual questions. However, it was in this friendly mode, the silent Rose volunteered to challenge the senior student Sunflower while she was supposed to comment on a different group in discussion six. While student-student interactions were encouraged within the groups and among all groups in this mode, group-supported debate generated more challenging comment and critical thinking than semi-debate presentation by all eight groups.

To sum up, though students did not state a clear preference for a combination of the face-to-face models and online modes of interaction, they reported their interests in a variety of models combined at different times. A suggested procedure based on the result of the study starts with online browsing as preparation, then face-to-face small group discussion to clarify problem points, following first with more friendly semi-debate by all groups. When the class discussion atmosphere is formed in the following weeks, group-supported debate is a more advanced face-to-face models to implement in class. Asynchronous mode of online discussions may also be deployed after class debates. Synchronous mode of online discussions could be an optional means for discussion topics that do not pose

challenge on EFL students' English vocabulary and comprehension. Despite some limitations in each model and constraints by tasks set by the teacher, each has its advantage at different time. Varying between small group discussions, face-to-face models derived from debates, synchronous and asynchronous online discussion may enable students to gradually change a new CHC boundary in a transforming strategy.

## 5.6 Face-to-face & Online Interaction Development

As action research involves a cycle of observation, implementation, reflection, evaluation, planning and modification (Norton, 2001), different interactions evolved in face-to-face models and online models of interactions during this research study. Students' interactions developed differently in a variety of aspects: group interactions patterns, online leaders, amount of verbalising, changing partners, online boundary and silences in relation to interactions. The following is an illustration of each point:

*Group interactions patterns differ.* Group interaction patterns differ online. Intra-group disagreement occurred frequently in the face-to-face environment, yet was not brought often to the public sphere online. As a result, their opinions seemed to be the same in face-to-face group presentation. This was shown in numerous cases of group-chained messages online. However, there was only one instance of intra-group disagreement by group three. The Online forum thus had shifted the discussion to a broader scope that small group interaction patterns seemed dissolved after week ten. Group-chain interactions were replaced by challenges from inter-group classmates and later inter-class strangers. From week 11 on, the non-research class posted challenging messages more than the total from week five to thirteen. A verbal student in the research class identified that this online phenomenon was due to the non-research class' participation, uncommon in a CHC context of the research class alone.

Students' stances may differ from a face-to-face class in the online environment. Group-divided opinions were reinforced by the class debate in this research study. Students were grouped to affirmative and negative sides by lot, not by will. Therefore, in team debates, students of the same side and groups needed to present the same voice in order to win the

debate. However, in an online learning environment, individual students can be true to own opinions and voices. Daffodil was for the affirmative side in class debate on the fifth discussion of weapon purchase, yet was extremely negative in the online discussion. Online discussions allowed true expressions of speech, thus invited participants different from the face-to-face learning environment.

*Online leaders differ.* Online leaders are not necessarily leaders in face-to-face small group discussions. Among the eight top online active members, four were verbal and others were quiet in the face-to-face learning environment. Without online discussions, the quiet ones would never express their critical thinking in class. Outspoken student in a face-to-face environment, Cinnamon, did not participate in online discussions as much as in face-to-face group discussions. Cinnamon explained in an e-mail to me that as a leader and an extrovert in face-to-face group discussions in class, it was easier for her to think out loud in talking and interacting with others face-to-face immediately. On the other hand, Rose was a quiet student being active online. She sustained the fourth, fifth, sixth and seventh online discussions with 21 postings. She took the efforts reading others' messages, cross-referencing others' messages, typing out comments and checking English grammar and spellings for text-based critical discussions. Some online leaders are quiet in face-to-face learning environments yet they successfully transformed their personality limitation to a well-suited online discussion forum and resulted in increasing verbal expressions of critical thinking. This suits CHC background

*Online writing and verbalised thinking increased.* The length of students' postings in the study increased, which was an indicator of CHC students' verbalised expression in the public sphere and EFL reading comprehension with written output. An example was Daffodil who tripled her posting length from one-page in discussion two to three and a half in discussion five. Both topics were hard news issues with face-to-face class debates, thus the amount of writing increased. Lily's counter argument to challenge Daffodil became more than four and a half pages. This finding is similar to Coffin, Painter and Hewings' (2005) study on Open University online argumentation pattern: the average length of posting of the group with more argument messages was three times of the group with more personal sharing and solidarity building. Disagreeing messages tended to be the

longer and exhibited more critical thinking indicators. The amount of talking and writing in EFL classes was an indicator of students' reading comprehension, writing proficiency, cognitive development and motivation. Unlike Salmon's (2002) first language Netiquette, which suggests summarizing opinions in simple phrases within one screen, expressing more opinions with more evidence in English is highly encouraged in EFL classes within CHC context. As participants found different interests online, they responded and changed partners.

*Changing Partners: Challenging unfamiliar ones*. As Holkner (2002) found, online members changed partners as changing casts in the actor network theory. The result of this study further showed that CHC students chose to primarily challenge unfamiliar students. They either publicly disagreed with 'lone rangers' in the class or confronted students from the other groups and the other class. Two examples demonstrated this finding. The first instance was in the most intense criticism in discussion two on Taiwan value from Palm on the senior lone ranger Sunflower. Similarly, in discussion five of weapon purchase, confrontation took place between students of different classes: Lily from the non-research class and Daffodil of the research class. These two students did not need to meet face-to-face after the online confrontation, thus fit the CHC mentality of keeping relationship with those around by engaging in dialogues with those unfamiliar ones. The CHC boundary was enlarged.

*Online boundary enlarged to challenge.* The online boundary was modified for these CHC students to allow challenges and still maintain class interactions with or without social harmony among those around them. The research study found students from the non-research class composed most intense challenging messages as they were not bound in the class relationship by the CHC mentality to maintain harmony. Inter-class interaction impacted on the cultural boundary for students were no under direct CHC influence. As strangers with no need to meet those they challenged face-to-face, the inter-class online interactions subtly changed the boundary of the research class who met face-to-face on a weekly basis and was more bound by CHC. One of the reasons that students participated online was because of the possibilities of choosing from multiple discussions. The next section will briefly discuss the alternatives of online discussion topics.

*Online silence and interposing interactions*. Some online member's silence may be attributed to cultural reasons, and should not be viewed in a negative perspective of lurking. The view of disconnection in the online message flow described by Marttunen and Laurinen (2001) in their Finnish study comparing the online and face-to-face groups was not applicable in the current research study. Unlike Vanderpool's (2005) finding that the online participation could reach 100% and an average of six to eight out of a class of 25 to 30, the research class did not have any volunteer in face-to-face learning environment except a logistic question on final exam in week 15 and Rose's comment on Sunflower in the semi-debate group presentation. The high participation rate suggested by Vanderpool (2005) was only possible in the online environment for CHC classes. Many reasons may be attributed to students' silence in both face-to-face and online environments, yet the online forum provided a supportive environment for CHC students. Cognitive and affective challenges along with cultural factors may have caused silence.

Nevertheless, these silent students learned by reading others' messages just as they listened to others' comments in face-to-face learning environment. While the top three active members contributed 55 messages, and the top eight students posted nearly half of all the online messages, the 17$^{th}$ and 18$^{th}$ most active students participated in the discussions 40 and 52 times despite with only two postings. Since the browsing frequency was not counted as extra credit, this indicated that quiet students enjoyed learning and critical thinking by reading others' critical dialogues. Therefore, I argues that the students who were silent also went through the critical thinking process. Silence could be a strategy temporarily used by CHC students to encounter culturally unacceptable confrontation to further their critical thinking. Eucalyptus returned to online discussion after six weeks of silence and adjustment.

Silence thus should not be viewed as inactive lurking as Salmon (2002, 2003), Berge (1995), Stegbauer and Rausch (2002) and Coffin, Painter, & Hewings (2005) described as a negative phenomenon in online interactions. Silence is part of an active mode of learning within the CHC context by engaging in others' message within a complex critical thinking process. It may extend CHC online members' critical thinking after their affection and

their cognition are prepared in verbalised form in a public forum. Silence thus may enhance CHC students' critical thinking by longer period of time for cognitive processing and affective breakthrough in online flaming and confrontation.

## 5.7 Summary

This chapter has discussed the overarching research question about teacher and student-student interactions in CHC students' critical thinking development fostered in face-to-face and online environments. The role of the teacher was significant in providing cognitive, pedagogical, affective and technical support prior to, during and after each online discussion to equip students for critical participation in discussions. Next, the shepherd facilitator was the response to the second research question on the teacher's role online in nurturing CHC students' confidence in verbalising critical thoughts. This could be achieved by calling students by name, showing the path at different stages, building relationship with student leaders and seeking the lost ones.

With regard to models of interaction, no one single model was perceived as best, yet students found integrating diverse debate-modified face-to-face models of interaction quite effective, especially after online browsing and small-group face-to-face discussions. Asynchronous mode of online interaction were more favored by students than in-class synchronous chat due to the time constraint in processing critical thinking and verbalising one another's weakness critically. Students of CHC backgrounds have demonstrated verbalised critical thinking in this action research against social and cultural norm in online environment. The critical atmosphere in online interactions also impacted face-to-face interactions by quiet students. Students traveled between the wall of face-to-face and online as they developed critical thinking and challenged members from different groups and different classes. CHC students' critical thinking underwent phases of budding, blossoming to final maturation of fruiting. The following chapter will conclude this thesis and present recommendations for future studies.

# CHAPTER 6

# CONCLUSION

*"Enter the Internet, a hosting ground to virtual communities, locales and spaces and to populations of individuals who found new identities and new cultures, oftentimes, existing only in the virtual" (Buchanan, 2004, p. vi)*

This chapter summarises the findings of the research, addresses the limitations of this study, and provides recommendations for future studies drawn from the current study. This study sheds light on culturally appropriate pedagogical patterns which will encourage cognitive transformation for critical thinking by Taiwanese EFL students in a CHC context. It also offers teachers suggestions for facilitating students' interactions in both face-to-face and online learning environments. It addresses cognitive, affective, technical and pedagogical support needed by CHC students as they travel behind the veil of the computer screen between face-to-face and online interactions to exercise verbalised critical thinking and challenge the CHC cultural norm. The following section will first present the summary of the major issues in this study.

## 6.1 Summary of the Study

This study was derived from four-years of previous experience in which I experimented with the diverse integration of asynchronous online discussion models in EFL courses. The study was an action research case study. The researcher modeled critical thinking to a class of EFL students in the only Language College in Taiwan. The class used both face-to-face and online discussions in examining a number of issues from the local media selected from the existing syllabus. Data collection consisted of: participant observation in face-to-face class sessions and online discussions, collaborative inquiry with the teacher, and focus groups.

The teacher's role as a shepherd was found to be effective in encouraging critical

participation in cognitive, pedagogical, affective and technical support. The cognitive support provided included: setting the context and background for discussion, framing the questions, cognitive modeling and challenging the students' ideas. The pedagogical support included providing cognitive and affective support in complex issues, resetting the discussion direction after confrontation, shifting topics and EFL assistance. Affective support focused on mobilising quiet students, comforting the challenged (for females with both face-to-face and online comfort) and assisting the challengers' affective difficulty in challenging the CHC boundary. Finally, the technical support included technical setup, lab assistance, a teachers' training workshop, in-class demonstration and other technical support.

As students were encouraged to make a cognitive contribution online, their critical thinking was demonstrated in this research study according to the operational definition of critical thinking. Within the online interactions, students were found to be able to identify the problem points, check the assumptions if provided with enough background, and to differentiate fact from opinion. However, they double-checked the evidence of the opposing positions in the online for counter arguments. Conclusions were drawn by logical reasoning, yet not always with reference to diverse sources. Nevertheless, they were able to show cognitive, affective and cultural considerations.

Among all models of interactions, no single model was preferred, yet face-to-face small group discussion mode was favored over asynchronous online modes, which was more popular than face-to-face debate, which was preferred over the synchronous mode. After online browsing and face-to-face small group discussion, students found it stimulating, alternating among debate by six students, group-supported debate by six groups and semi-debate group presentations. The alternative was helpful in helping to clear up comprehension problems and engaging in critical discussions after online browsing. With the models above, typical quiet CHC students successfully transformed from silence, to germinating silence, and blossomed in verbalised critical thinking first online and later in face-to-face interactions.

## 6.2 Limitations of the Study Revisited

The study set out to investigate verbalised critical thinking development, yet the CHC cultural context in this case in Taiwan seemed to lead to an experience which crossed face-to-face and online environments in creating new cultural boundaries. Specific findings of this study could not be generalised to all other EFL classes because of the following limitations:

- The study involved a limited number of 43 participants in the face-to-face environment and 37 in the online environment.
- The college is the only foreign language college in Taiwan, situated at Kaoshiung. The urban demographic factor may have influenced students' online participation and critical thinking expression in English.
- As a case study, this study dealt with a particular class in real time under the constraints of the teacher's existing curriculum.
- The length of the online discussion was twelve weeks, less than a semester.
- The teacher's western academic training and Hong Kong origins had a mixed impact on Taiwanese students' open critical discussions in political issues. Well trained in western critical thinking, yet bound by the CHC teacher's authority as a full professor, the teacher asked questions with desired responses in line with her political position. This may have limited students' free expressions as Hong Kong is now under the control of Taiwan's rival, communist China.
- The teacher had an online novice status as an online user and facilitator and clear preference for face-to-face class interactions, which may have hindered students' full online participation in this research study.
- The research class was a newly formed class with a discrepancy of English levels and backgrounds, which may have affected the online interactions. Students with more advanced English level processed verbalised critical thinking in a different pace from students with lower-intermediate level. This may result in diversity of the amount of verbalised critical thinking in online environment.
- A non-research class was invited to the online discussions. The teacher's other class of the same course joined the research class after week eleven. This may have influenced

a class-base research study, as each class had different communication culture and interaction patterns in face-to-face and online environments.

- Due to the voluntary nature of the study and the fact that the researcher was not the teacher of the class, students' participation was not as active as it could be in normal CHC classes in which students obey teacher's commands.

In view of the limitations above, the findings of the study may not be generaliseable to the entire university population in Taiwan or all EFL college students under CHC influence worldwide. Despite the different flavor of interaction and expression in the online and face to face environments, the results,s however, indicate a number of recommendations for practice.

## 6.3 Recommendations for Pedagogical Practice

There are several recommendations for pedagogical practice from this study that may help foster critical thinking in the EFL courses within the CHC context.

### *6.3.1 Student-Teacher Interactions*

Western online researchers Walker (2004), Walker (2002), and Pilkington (2001) stress the need for teachers to exercise challenge in online discussions and EFL educators (Chiu, 2004a; Norton, 2000) advocate for online teachers to reduce their authority and the pressure on EFL students. This study confirmed that online teachers need to be both challenging and friendly. In this study, these characteristics were embodied in the image of the shepherd. This study found the effectiveness of the techniques of shepherd in encouraging participation by setting up affective and cognitive modelling for the potential leaders in each group first in face-to-face and then in online learning environments. These leaders in turn posted messages as modelling to their group mates and elicited more committed critical interactions. The recommendation which might be made from this

finding is that teachers call students by given names, listen to their needs, lead them by example, search the "lost flock" and promote the use of discipleship with group leaders. The initial leaders can be found by observing face-to-face group interactions and will lead peers by the example modelled by the teacher.

With regard to participation, the average number of six to eight active students illustrated by Vanderpool (2005) in her face-to-face discussions equals the initial number of verbal students in this voluntary online study. This study indicates an average of seven to twelve committed student participants could lead the online discussions well after the teacher's initial modelling. The researcher argues this is probably an ideal size for online discussions. Online discussions can be effective with a maximum of 20 students within less verbal CHC context. Teachers are recommended to cultivate leadership and divide large classes into sub-groups in online discussions.

### *6.3.2 Facilitating Three-Phase Online Interactions*

With regard to the second research question on facilitating techniques at different stages of online interactions, the online interactions in this study went through a cycle similar to those noted by Salmon (2002), Kao and Chen (2003), and Harasim (2002), yet with a conflict-silence related cultural phenomenon. As these three models were contextualised in a first language context, thus the CHC cultural factor in interaction patterns was not taken into consideration. In this study, online interactions in the initial phase were marked by group-chained interactions. While Kao and Chen's techniques of supporting, interpreting and suggesting were effective in facilitating online interactions, the challenging technique needed in critical thinking development was not included in their model. In the middle phase, challenge occurred with silence. Intra-class challenge developed to be inter-class confrontation in the final phase with those whom they had not need to meet, thus not bound by CHC. This study sheds light on silence-conflict relationship in conflict-avoiding silence, confrontation management and shifting to other discussion topics, which were not mentioned in any of the three models above.

### *6.3.3 Silences and Conflicts*

As silence is a normal practice and the conflict-avoiding silence is a special phenomenon for students of CHC background (Chang, 2001; Sun, 2003), it is important to re-examine silence in CHC online interactions. Contrary to Salmon (2002, 2003), Stegbauer and Rausch (2002), and Coffin, Painter, and Hewings (2005), lurking should not be perceived as a passive mode of avoiding learning in the CHC context, but an active mode of learning by reading others' messages. Silent members like Rose, Eucalyptus, and Lavender progressed in critical thinking as well as outspoken ones like Sunflower and Daffodil. Some 'lurkers' start to join the discussion at a later stage or after online confrontation. Interposing messages thus emerged. In students' confrontation, teachers of CHC classrooms do not need to re-direct the online discussion to a new direction to alleviate the attention on confrontation. Instead, teachers should wait for support messages from fellow students and let other voices fully discussed to move on to the new discussion question. To counter the conflict-avoiding silence, a teacher needs to provide affective support to both challengers and those being challenged during and after conflict-avoiding silence. Students under CHC influence need individual affective support when they violate the cultural norm of harmony. Close observation and continued caring in both face-to-face and online environments will help students overcome the period of conflict-avoiding silence. To be healed from the emotional wound of challenge, female students under stronger CHC influence tend to need longer conflict-avoiding silence as the social healing construction. It involves peers' online support messages, face-to-face comfort, verbal affirmation, as well as non-verbal encouragement such hugging and smiling acceptance.

### *6.3.4 Models of Interactions*

Regarding to the third research question about models for interactions for critical thinking, no single model was seen as dominant. A mixture of debate-related face-to-face interactions and asynchronous online discussions creates the affectively supportive environment needed for cognitive challenge. Contrary to EFL educators Kung (2003) and Sotillo's (2000) findings of the conversation-like English generation in synchronous mode,

in-class synchronous discussion was not found an effective mode of interactions by most students, yet favoured by few students who only participated in synchronous chats, but not asynchronous discussions for clarifying problem points in mixed text-format in Chinese and English. Due to time pressure and the complexity of verbalised critical thinking, an asynchronous mode of interaction and a variety of face-to-face models of interaction modified after debates served as more effective models of cognitive support than synchronous mode in EFL online critical discussions.

## 6.4 Recommendations for Future Studies

In view of the findings of the interaction patterns in CHC context, this study offers the following recommendations for future studies in online interactions for EFL students under CHC influence.

- Since the majority of classes that implement online discussions are Internet-supplemented ones, future researchers are recommended to investigate how the same teacher's face-to-face role and online facilitator role (separated in this study) may foster students' participation in groups and in online interactions.
- Future research is recommended to explore CHC students' critical thinking in online and face-to-face interactions in longitudinal studies as critical thinking develops in long term. Further critical thinking development may have occurred in the following semester or school year.
- Future research may explore whether males and females' challenge patterns differ and how they react to challenging in face-to-face and online context in CHC context.
- Cross-cultural groups of patterns of interaction and challenge patterns are worth investigating among different areas in Asia under CHC influence. As some had long-term western exposure and some with Marxist influence, communication pattern in challenge and silences may differ in adhering to traditional CHC silence and harmony principles.
- In-depth analysis is also recommended in case studies to differentiate online disagreements, conflicts, and flaming and a suitable boundary for contemporary college

students of CHC background to express opposing opinions without confronting.

## 6.5 Conclusion

As Merryfield (2003) contends, the "veil" of security in CMC helped uncover students' real identities and encouraged students of non-Anglo-Saxon backgrounds to freely interact and challenge behind the computer screen. In this study within the CHC context, new identities in CMC led to unique communication patterns that required painful affective adaptation of verbalising critical thinking. Violating cultural norms was an unfavorable part for most students from the research class in this study. However, the challenge messages from the other class dramatically changed the boundary of discussing in online environment. This consequently changed the face-to-face boundary of interactions for critical thinking by the unexpected participants from the other class who were not bound in CHC harmony principle. The use of the Chinese-English bilingual model in small group face-to-face discussions and the transition from primarily face-to-face interactions supplemented with after-class asynchronous interactions, to in-class synchronous and asynchronous online interactions were valuable in the critical thinking process. This study yielded insights as to how to better respond to cultural factors in EFL college students' critical thinking development in face-to-face and online environments in the local context of Taiwan

Asia has 60% of the worlds' population and the number of Asian students in Australian and other western tertiary education systems has dramatically increased. According to the Australian Government Department of Education, Science and Training (DEST) (2005), 80% of its international students are from Asia in 2005 with a projected worth of AUD 38 billion in 2025 (p. 3). A new issue of western academia is how to better engage Asian students' participation in class without being confined to the CHC background. This study has demonstrated how CHC students successfully bridged the gap of cognitive pursuit in EFL with culturally appropriate practices and support in implementing critical thinking. When applying the western communication technology in eastern context of CHC, teachers need to be affectively sensitive to students' emotional needs before addressing the cognitive process of input, processing and output in critical thinking. As in the proverb

illustrating the significance of timing in the beginning of this chapter, it is important to implement pedagogy according to time. Gentle transition of fostering critical thinking at different periods of time by the shepherd is important to process online interactions. The three different phases include: budding phase to build relationships with the students, blossoming phase to encourage verbalising critical thinking and fruiting phase to set new boundary of interactions first online and eventually in face-to-face learning environment. Facilitating conflict-avoiding silence and confrontation management of both the challengers and the challenged ones is an important issue in CHC context. The shepherd leadership in this research study contributed to the cognitive, affective, pedagogical and technological guidelines needed in integrating online discussions to face-to-face classrooms for critical thinking. Personality types fluctuated as quiet CHC students became critical participants online. Despite some affective pains involved in overcoming the CHC cultural norm of silence and harmony for both the teacher and students, the gentle transition on models of interactions with shepherd leadership in both face-to-face and online learning environment in this research study shed light on critical thinking implementation in an EFL class in a local context of Taiwan.

## Appendix 1 Sample of Observation Notes

Date: Nov 15, 2004,

Week: Week 9

Observation Log: 4th

Discussion Topic: "Taiwan value"

The observation parameters for classroom interactions included

1. class discussion atmosphere was quite lively, yet nervous with debaters expressing tense feelings: the class of 8 small groups was divided into two parts by the teacher's assignment of each individual in a special configuration. One group forming a U shape expressed a willingness to discuss as a group, but no one wanted to be the debater. The other group in a shape similar to L, quickly volunteered 3 debaters.
2. the question-raising and question-answering pattern: pattern of interactions (the interaction chain of cross-referencing one-way or highly interactive in sharing with numerous students commenting on one another's viewpoints)
3. students response to the rival side's challenge, and the teacher who remained neutral during the debate without commenting on any techniques at any stages of the discussion ("supporting," "facilitating," "interpreting," "suggesting," "limiting the focus" of discussion from irrelevant query, "consensus taking," "linking diverse opinions for problem solving," "timing," and "evaluating" skills),
4. the level of excitement designated by facial expression, high tone, tight body posture for speakers and listeners leaning forward with eyes open non-verbal expressions of the speakers and the listeners,
5. frequency of individual students' contribution: 6 debaters each speaking 3-4 minutes one time, and Sunflower asking a question from the floor once
6. the number of students engaged in the discussion: 7 students including 6 debaters' and Sunflower
7. intensity of interactions (mild intonation or vibrant): intensity was high as the class passionately supported its designated 'side' of the debate and emotionally showed their support for their teams position's. The issue was 'Economy over environment' as a Taiwan Value.

## Appendix 2 Sample of Online Data

Week: Week 9

Online Log: 4th

Discussion Topic: “Taiwan value” on economic value over environment

The following is the glimpse of the early phase of the online discussion after the face-to-face debate described above. Students’ cognitive and affective processes in online and face-to-face environments could be compared from Appendix 1 & 2. The early online participants Daffodil and Margarita in this discussion of “Taiwan value” were the debaters in the face-to-face debate of the same week.

| | |
|---|---|
| 日期 | 2004/11/17 21:46:22 |
| 張貼人 | Jean Chiu (jeanchiu) < |
| 標題 | Debater's points |

Hi, there,

Fun debate we had in class on Monday. Our development policy is based on Taiwan value (what we cherish most), which is built upon our identity.
Can we have the debater's notes from the affirmative side & negative side?
More evidence to support a claim?
The first Lavnia & Candy's points were well stated. The second debaters of the affirmative and negative sides refuted that the development was for (or not for) greatest benefits of the people.
More links:
Concerning the environmental protection, Vice Pres. Lu
http://e-info.org.tw/proreport/2004/pr04071201.htm
呂秀蓮發言惹爭議 總統府：重點在政府花錢應治本非治標
http://news.pchome.com.tw/politics/ettoday/20040709/fpt-20040709202638042026.html
So is the ecological engineering of the quake-stricken areas in planting more trees and repairing slopes on mountains a good policy or a self-beneficial strategy to rebuild Central Taiwan?

smiling Jean

| | |
|---|---|
| | |
| | |

| 日期 | 2004/11/18 10:54:08 |
| --- | --- |
| 張貼人 | Daffodil < > |
| 標題 | Debater's points - Agree side |

First of all, we agree with that all constructions are based on the interest of Taiwan people. There're 3 points that I would like to propose:
1. The economy constructions, such as Shin-tzu Science-based industrial Park, which provided more job opportunities to the people, and also enhanced the neighbor areas' economy growth.
2. The Massive Rapid Railway, not only attracted foreign cooperations here in Taiwan, but also boost up the employment rate.For people in Taiwan to have more job opportunities.
3. For the tourism, it attracted foreign cooperations to come to Taiwan, and also helped a lot in building the image of Taiwan to the international world wide. Tourism improved a lot in our economy, and without it, we would have lost a lot of income for the country.

These points are not for the ""Special group"" only.For the sake of those special group, we would have the chance to boost up our economy, and earn more opportunities in employment. Which is also good for the people all around Taiwan. If there's a job, you won't be out of work. If you're out of work, it doesn't mean there's no job opportunity, maybe you have to strive for it by yourself. As a Chinese saying, "There's no free lunch."
If you want somethin', you gotta work for it. And the government has done its best.

Though there're some issues about the construction has not brought the people advantages, yet it ruined the natural environment. For this point, there's no such an evidence pointing that the natural environment was ruined by the constructions. However, for the conventional agricultural activities, the people grow Betel nuts or build golf courts, who really destroyed the natural environment. And to which, there're evidence out there for us to see.
Besides, the government spent a lot of money on rebuilding those constructions is because it must have to be rebuilt. As long as there's a damage, there should be a restoration. Moreover, the natural disaster that everybody should understand and know it's unpredictable. The only thing that government can do is to help them rebuild.
These are the main points i think... Lavin

| 日期 | 2004/11/19 17:07:04 |
| --- | --- |
| 張貼人 | Margarita < > |
| 標題 | Negative side~~~ |

Hi,this is Candy from negative side. I'm here to state our opinions!!!

We do not think that the policies made by government are for the "interset of Taiwanese people". Let me recount the way. ^^

First of all, we think that the government made a wrong policy decision by adopting so-called

"ecological engineering techniques" in repairing slope lands damaged by the September 21 earthquake in 1999. Moreover, floods and landslides have become more frequent since the government began implementing its "ecological engineering project". ( Evidence from : Tungshih Village in Taichung County) There are a lot of similar wrong policies made by government. We think that the policies are not making for "people's interest". Definitely not!

Secondly, to our mind, nearly 80% percent of polocies are "near sighted", which means government just want to get more votes from election; therefore, the "Policies" proposed by government are just for their own good. After winning the election, the proposals aren't continuing.

The third one is that many policies such as "science industrial park" are not for ordinary people but for "high class people". We believe that these policies are excellent for "rich" people like "manufacturers, engineers, managers, and the like" not for "little" citizens. It causes wealthy people becomes much more wealthy and poor people become much more poor. It's not for "majority." And as those wealthy people are worried about which new car they should buy, the poor people are struggling for sustaining their living. Is that fair? We have to say "absolutely no!" Are those poor people not Taiwanese? We wonder.

On top of this, we think that the government have the responsibility for "making the correct laws." The officials can't blame that "betel-nut trees" causes landslide. The owners are under permission of government to plant these trees; therefore, we could not put the burden on them. If that land or mountain is not suitable for growing betelnut trees, government should take out thier power and ban them. Don't you feel the same way? Above all, we disagree that "Policies are for the interest of Taiwenese people."

## Appendix 3 Researcher's Reflective Journal

Time: Nov 15, 2004, 13:10-16:00

Week: Week 9

Researcher's Journal: 4th

Discussion Topic: "Taiwan value"

**Encouraging Speaking up in Class & on E-course**

The class started with the teacher's display of her original summary and closed Q-A on the screen and followed by the teacher's introduction of the researcher's links for extensive reading on the E-course as the method of implementing cognitive input through the Internet. The researcher demonstrated the links provided on E-course in a discussion posting with a joke teaser. The class amazed, " Wow, Jean is smart!" Message was EFL students need to speak up their mind or the class may mistaken that they do not understand the English spoken in class or they are not intelligent. There is responsibility for all to share opinion and contribute to the class and online discussion is a forum for that. The topic of the week posted on the E-course was the "Taiwan value" in the dispute of environmental protection and economic development. The teacher finally hinted that there would be debate on the topic of re-construction project in the third hour of the class.

**The Class' Lab Experience**

The entire class was brought to the new computer lab downstairs. Students looked happy and excited as they lined up for the E-learning experience. The lab was an open computer lab that required individual registration with their photo ID. Therefore, it took more than ten minutes in total to settle the class. The configuration of the lab was unique in the sense that most of the seats are placed in pentagon for group discussion. Most of the groups in the class were clustered together with some pairs sharing one computer monitor for closer discussion. Students went online to log into E-course. By the time the researcher also logged on, the number of students browsing the class E-course ranged from 23 to 30. Some were taking notes diligently to prepare for the debate later. However, the advanced browsing took up most of the forty five minutes as students read the links provided by the researcher, yet the time did not allow students to compose discussion postings on E-course platform. In this first try-out, the cognitive task was extensive reading and the exercises here focused on building the cognitive base of knowledge and comprehension. Students did exchange some conversation as they read and discuss some points to clarify their problem points.

If time permits, the researcher perceives that after browsing with some face-to-face discussion, students can move on to post their opinions online as a means of verbal exchanges among the class. This can be done either by encouragement if not requirement in the second period of the class.

**Critical Thinking in First Debate**

The teacher divided the class into two sections and started with instruction on debate format and the sequence of the three debaters on each side in the beginning of the second period of the class. The debate topic was “Is the government development plan for the greatest interest of the Taiwan people?”

The two sides had very different communication patterns and dynamics. The affirmative side spent most of the time together in discussing the advantages and the job opportunities brought by the re-construction. This group was looser in the sense that they did not decide the debaters till the last minute and the methods included lot drawing, volunteering the class leader and some games. The other side decided the three debaters early on and divided the twenty five students into different tasks in briefing to the debaters who tried to focus on organizing the points.

**Teacher-Researcher Relationship: Intersubjectivity**

The teacher-researcher relationship was perceived slightly different from the researcher’s viewpoint in the sense that the teacher was more satisfied than the researcher in their relationship with the researcher’s presence in class to provide more links for extensive reading, yet the researcher was not able to implement different modules of “online interactions” in class beyond browsing as previously designed in the research procedure. The learning curve for the researcher to work with the teacher in face-to-face and online participant action research is slower than expected. The learning curve for the teacher to adopt the medium of online discussion is also slower than expected, while the learning curve for students’ online participation also depends on the teacher’s attitude in integrating online discussion into formal class curriculum. In a sense, the teacher’s focus in students’ English presentation techniques and pronunciation skills in presenting their summary for reading comprehension, while the focus of the researcher is accessing controversial viewpoints through online browsing and discussing in an open online forum.

The researcher is balancing between a participant action researcher and a researcher observer in assisting the teacher to increase class interactions without directing or dominating the class and the curriculum. The inter-subjectivity is an issue. The researcher had talked with the teacher face-to-face, via phone or e-mail before class to discuss with the teacher about the discussion questions for the reading of the week before the class. However, the researcher observed that the teacher still used the questions prepared before the semester started, which did not elicit much two-way interactions suggested by a student’s e-mail to the researcher. As a result, the researcher suggested more controversial online discussion questions to the teacher and discussed with the teacher to encourage students to post “during the class time.” Nevertheless, the teacher did not perceive the online discussion as proper ways to allot class time. Partially due to unfamiliarity of E-course system, partially due to her conception of what teaching a class ought to be, the teacher allotted the first two hours for in class discussion on summary with some closed questions and presentation for summary in the third hour before week nine.

**Strategies in Increasing Participation & Researcher-Student Relationship: One-on-One Contact**

The online interactions in the first round of discussion were fair with seven students' voluntary participation on the controversial issue of betel nut girls. The second online discussion of Taiwan value, on the other hand, did not generate much online interactions due to students' lack of understanding of what it means in concrete sense. Value is a term commonly used as the cornerstone in ones' belief system, yet is not a familiar terminology in Chinese language and among students here in Taiwan. The researcher has tried different attempts according to the supervisor's suggestions:

1) Allowing Chinese in input and output during the immersion period,
2) Asking active participants' suggestions on how to increase classmates' participation online,
3) Inviting another class to participate in the online discussion,
4) Extending the action research time for more data collection to see how the interactions and critical thinking in this class and other classes may evolve over time.

After week nine, online browsing for the first hour and in class discussion for the second hour with whole class debate in the third hour. As a result, without maximizing discussing online during the class, few students volunteered to participate in this discussion again online after three hour of class time on the topic. The researcher persuaded the teacher to ask each group to post group answers to discussion questions or debate notes online after class, but even after the teacher finally agreed to encourage students to go online after class, she forgot to say so. Therefore, the researcher had limited directiveness in what to be discussed (sometime teacher's question is not discussable to have opposite opinions) and whether to use Internet as the supplementing element**.**

Some chances were missed to have synchronous or asynchronous interactions during the time while the teacher was away. The first chance was week eight, but the class time was suddenly changed to make-up class of another course. The other one was that the teacher once informed the researcher that she hoped the researcher would substitute her for this class while she was out of town in week eleven. Nevertheless, in week nine, the teacher told the class that they did not need to come to school for the class because she was away without first informing me. This was the second chance that the researcher was not able to implement class wide synchronous discussion. The researcher originally planned to have online browsing, small group online chat, then asynchronous class interactions for that day, yet the teacher had announced assignments for students to submit two days after the class time. The teacher later answered my confusion at this change that since students were given assignments, they may not want to come to class. The research plan was foiled.

A compromise was made when the researcher negotiated with the teacher for the chance to request the whole class to submit their assignments on E-course homework section to increase uses and familiarity of the E-course platform. The teacher agreed, but expressed her desire to have students collect paper-version as well for ease in reading over and commenting students' 800-word summary of Madame Chiang Kai-shek. In order to make it convenient for both the teacher and the students, the price the researcher would need to pay is to print out the fifty summaries for the teacher.

In responses to the missed chances to have the entire class log online for online participation, the researcher has tried several ways as multi-ways to interact with the students. Since no student posted anything other than a logistic question on Taiwan value, the researcher sought chances to reach the students at more personal level. At the day when the students had finished their face-t0-face class debate, the researcher also verbally encouraged two debaters for their brilliant performance in the debate by saying "You have done a great job. Quite aggressive approach!" and padded their shoulders as a para-linguistic expression of my acknowledgement and appreciation of their debate job. One of the students felt excited about the compliment, while the other turned to her debate mate, saying that the mate should have been tougher and more confident and aggressive while concluding the points.

Secondly, the researcher personally invited some students in the corridor to log online to share their true opinions instead of the points of the assigned affirmative or negative side after class. Some students said they would when they have free time (which was a polite way to say I may not have time to do this extra work), while one showed limited interest since her viewpoints were similar to the debaters of her assigned side: not necessary to post online for major viewpoints were heard in class. The researcher understood that without teacher's verbal requirement and supporting action, it is difficult to involve the whole class and implement something apart from the curriculum actually carried out during the class time. At a bathroom encounter, the researcher happened to converse with the student who posed a question on whether she could express her opinion on Taiwan identity. The researcher recognized that she was the only volunteer to time the debate in the class, but did not know that she was the only one who posted. She asked me during the break if I The researcher thought the debate was not good because she observed a number of facial expression changes on me during the debate. The researcher shifted the turn to herself and asked how she felt about the debate. She said she thought the debate was not well prepared because it is the first time and more preparation was needed for better debating. The researcher smiled at her and asked her name, just to find out she was the very student. Later after class, the researcher ran into her again and smiled at her to invite her to post her own version. She asked if she could post Taiwan identity rather than the government's policy to represent Taiwan value in the re-construction of natural disasters. The researcher replied, "Of course! You are welcome to do so."

Thirdly, the researcher e-mailed to the seven students who posted in the previous online discussion, but only four students left their e-mail addresses there. The researcher made it personal in the sense that each e-mail message started with a different compliment for what they have accomplished either in previous online discussion or their specific performance in debate. The tailor-made e-mail messages got two responses. More students browsed online, but discussion was pending for a while after the timer posted her confusion over Taiwan identity. Students underwent cognitive processing during this period of silence as in a learning curve aiming for cognitive output.

Fourthly, the researcher also e-mailed the observation log of students' debate points from both sides to the most active online participant. The researcher saw her helping the final debater to refute and conclude in the debate, thus thought she may be more familiar with some points that the researcher missed. This student prompted was a retaker of the course, so did not know the other students quite well. She dropped some short points concerning the conclusion of the negative side and suggested to directly ask the debaters themselves to post their debate points online. She gave the researcher the Chinese names of the first two debaters of

each side. The researcher had difficulties in matching students' Chinese names on the school list with their English names and their private e-mail addresses used in E-course. Thus, the researcher followed up and checked students' e-mailed some debaters for posting debate points.

Fifthly, the researcher struggled in thinking of ways to invite more students to textualize what was been discussed in class to extend the conversation. The researcher changed the idea not to involve in students' life and phoned a debater through mobile to invite her and her mates to post their debate notes online. She was very surprised to hear from the researcher, an alumnae school-sister teacher. She probably had a closer relationship with the researcher, since she once offered the researcher a piece of cake to eat in earlier weeks. Two days after, she posted her message entitled: Debate points: Affirmative side. I also responded to that message with some suggestion to the evidence mentioned which is needed to prove a claim.

Next, the researcher e-mailed two students from other class to participate and asked them for ways to sign the consent forms. The researcher acknowledged these two students from previous contact elsewhere and they took the same teacher's course in a different session.

Moreover, as a believer of social constructivist, the researcher also stayed online during the period that students tend to log online to see if it is possible to chat with them in the Real Time Chat under E-course system. Only one out of three times chat experience gave the researcher some insight about how to better encourage online interactions. Some students logged off from the system once seeing me online and sending a greeting message. One sent me a "currently busy message" while the other logged off quickly. To increase immediacy with the students, the researcher used some commonly-used expressions. These techniques include: abbreviations (how r u?), colloquial expressions (88, hmmm), expression symbols ☺ and emoticons such as : ) and : D. I did a follow-up with the student who was willing to chat with me and she was one of the debaters. I asked her why she had great ideas, yet it was the other classmate citing her idea online instead. She responded that it was because she did not have Internet access in her rental place, thus she needed to ask classmate's favor to use the computer. Reading discussing issues and composing a comment normally take a long time. As a result, technical access is still an issue here that bars some students from posting their ideas online after class.

## Appendix 4 Sample of Researcher's E-mails with the Teacher

E-mail 2, week 5

**Date:** Wed, 22 Sep 2004 17:36:32 +0800 完全表頭

**From: Teacher**

Title**:** Re: Jean's proposal

Dear Jean,

Thank you for your e-mail. Yes, to teach in Lingnan (Hong Kong) was very much different from teaching at Wenzao (Taiwan). It is simply because I have to teach English Language and I was trained in teaching politics. I would be happy to discuss with you on your participation in promoting critical thinking in my course of English Reading. Let us sit down and discuss about that. I shall inform you how I am going to teach Reading course and you should be ble to tell me what to do….

Bxx

On Wed, 22 Sep 2004 12:24:23 +0800, 邱怡靜 wrote

> Dear Sister,
> How's your first week teaching at Wenzao so far? May be a bit
> different from Lin-nan University. I planned to deploy participatory observation (both in class and online to see the different patterns of interactions and critical
> thinking development), interview with you and focus groups with
> students. Need you and students' consent form for me to observe
> them. Thanks for your interest and partnership in this online project. smiling Jean

E-mail 9, week 11

**日期:** Fri, 3 Dec 2004 10:55:19 +0800 完全表頭

**From: Teacher**

Title**:** Re: Weapon Purchase extra reading?

Dear Jean,

…Your idea is good. However, I still find students needs some kind s of instructions before they are sent to search in the computer lab. The instruction part can save them from searching blindly to other things. The instruction given in the e-course is quite different from immediate instruction given on the spot by the teacher. Otherwise e-course can replace teachers.

In the class I would like to ask them to do two things:

1.Study the issue of weaspon purchase NT $ 600,000,000 and the controversy.

2. Debate on the weapon purchasing. The pros and cons ofthe issue with sufficient and logical reasons.

If you have questions lelt me know. Love and prayers.

## Appendix 5: Pre-Focus Group 1 Group Reflection

This appendix represents the data of the group reflection which was conducted within class time in the first real time chat in week 10 prior to the first focus group. Three major questions were asked in the group reflection sheet: 1) commenting on four different modes of interactions: a) f2f small group discussion, b) f2f class debate, c) online real time chat and d) asynchronous online discussion, 2) group preferred mode of interaction after browsing and 3) suggestions for the teachers to better help critical thinking:

**a) f2f small group discussion (before midterm):** favored by most groups

**b) f2f class debate:** least liked for the pressure to support a claim with evidence and challenge, the lack of time, the lack of understanding of the debate focus.

**c) online real time chat:** Most students did not favor real time chat due to the lack of computers in the public computer lab at the time the class entered for online browsing. Some students did acknowledge their interest in chatting.

**d) online discussion**: More than half of the students found asynchronous online discussion a useful way for communication for the following reasons: freedom of individuals to share, flexibility of time, equal voice on the forum to post their opinions.

2) What is the preferred mode of interaction ***after browsing*** for best interactions?

3) How could the teacher better help your critical thinking in posting relevant links, Topics & Q, announcement of topics, reading skills and technical assistance?

The group reflection was conducted in the second hour of the day when the class first tried out real time chat after browsing in the school public computer lab on Nov 22nd. Three major questions were asked in the group reflection sheet: 1) commenting on four different modes of interactions, 2) group preferred mode of interaction after browsing and 3) suggestions for the teachers to better help critical thinking and online interactions.

Result of the Group Reflection Sheets

Q 1) Discuss our critical thinking in the following modes of interactions: f2f small group discussion, f2f class debate, online real time chat (the one we had) and online discussion like betel nut beauties.

**f2f small group discussion (before midterm)**

| 1 | **Group Perception of f2f Small Group Discussion** |
|---|---|
| | Face-to-face is not a bad way because it saves a lot of time. If you have a lot of questions to ask, you can easily get answers from others. |
| | It is the most effective way because everyone has a chance to participate in. |
| | Actually our group prefers small group discussion, because we can exchange our background knowledge immediately and share it with other groups. |
| | We can exchange our ideas, opinions with each other. We should have more time to think over and over again. |
| | It is ok. |
| | Not really useful. We assigned each one a work at home, but we didn't really discuss much. |
| | Highly recommended. |
| | Face-to-face is the best way for people to communicate with each other, but… |

Most students acknowledged face-to-face small group discussion was an effective mode to interact and develop critical thinking. Several reasons were given to illustrate its advantageous position among four modes of interaction: immediate question-asking and answering, effective exchange of background knowledge, opinion-sharing face-to-face, collaborative thinking for a resolution, and equal participation in small groups. Two groups reported it is accepted without listing the reasons, while two other groups commented that it had certain limits with one group stating effective face-to-face small group discussion required all members' preparation prior to the class discussion. This implied that if students were assigned different tasks such as writing summary, main ideas, supporting ideas and evidence, all would need to fulfill their parts in order to have effective discussion, or the class discussion time would be wasted in reading the required materials and searching information instead of fruitful discussion. Another implication was that students at different English proficiency levels function differently in their cognitive development, seen from the comment of "not discuss much." There seemed to be a desire for more competent students to engage in more challenging discussion forum.

**b) f2f class debate**

| | |
|---|---|
| 2 | **Group Perception of f2f Class Debate** |
| | We do not like it because of too much pressure |
| | It is not good. Class debate needs a lot of time to prepare, but we do not have enough time to prepare. |
| | Only few classmates were involved in the debate, so those who didn't participate had no space to think. |
| | Debate is exciting, but the floor actually did not participate in the activity. That is the pity. There are too many people in the classroom, so it is hard to aggregate everyone's work. |
| | IT will be excellent if conducted in small groups. |
| | Interesting, but not enough time preparing for the whole discussion. It would be better if everyone can take a part in the debate, not just 6. |
| | No more! IT takes time to prepare before class or else it is ineffective. |
| | We don't have enough time to organize the materials and not everyone in the class could join the debate |

Students generally did not like class debate though some found it interesting. The dislike was attributed to the pressure to support a claim with evidence and challenge, the lack of time, the lack of understanding of the debate question at the time of information search and the large size of the class, which made it difficult to coordinate different opinions from the floor to organize debate points for the debaters and the unequal participation during the debate. Students prefer less pressuring mode of interactions for critical thinking development.

**c) online real time chat**

| | |
|---|---|
| 3 | **Group Perception of Online Real Time Chat** |
| | some did not have computer stations to participate in real time chat |
| | It is good! We can share our opinion through the Internet and we can have more time to consider the points. |
| | It is inefficient. Since we do not have enough time to search, we have nothing to chat and computers are not enough. |
| | It is very good, but to chat on screen for 118 entries is an exhausting thing. |
| | This doesn't really work if we do not get on the Internet at the same time. It is not effective. If we can all use computers in class, that would be fine. |
| | It should be fun and interesting, but not all get online, how can we chat? |
| | It depends on whether we have time, but it is a very good communication |
| | Not everyone is online at the same time, and typing wastes too much time. |

Due to the lack of computers in the public computer lab at the time the class entered for online browsing, some students shared computers during the process, thus were not able to participate in the real time chat, thus synergy not found in this session. Students also expressed that they needed time in the lab, indicating the cognitive input period was not sufficient to produce cognitive readiness for analyzing and evaluating an issue in "real time" mode. In addition, one group that had 118 entries in the discussion also found typing a waste of precious time, especially while they were sitting not too far from each other in the configuration of the lab and they were actually able to talk their thoughts out and clarify any problem points face-

to-face immediately. Technical problem in access was a major problem, yet some students did acknowledge that it should be fun and interesting to chat online with group members for the synchronistic nature and the excitement it may bring as in MSN or Yahoo messaging function.

**d) online discussion**

| 4. | **Group Perception of Asynchronous Online Discussion** |
|---|---|
| 62.5% | This is a good way to discuss the issue for we can post our opinions and others can reply. Many people can talk on the same time or use the discussion board. |
| | It's a good way! But not everyone has the time to discuss "after class," for we need to prepare other homework at home. Maybe we don't have enough time to do it after class. |
| | It is more useful than small group discussion, because everyone can present their opinions with well constructed ideas. |
| | Not bad. |
| | It is free and easy to express or share opinions and ideas without time limits. |
| 37.5% | We do not have time to participate in online discussion |
| | We only leave message, but there are too many people in the class, so it is unlikely to read through all the others' messages within a short period of time. |
| | Some students do not have computers at their dorm; therefore, it is inconvenient for them to get online and discuss. |

More than half of the students found asynchronous online discussion a useful way for communication for the following reasons: freedom of individuals to share, flexibility of time, equal voice on the forum to post their opinions and reply others' and the time allowed for cognitive development to construct well organized ideas. However, some groups expressed the time consuming nature of online discussion. Students need to read before they could post and leave their message, thus it is unlikely to read through all the others' messages within a limited time and Internet access was another issue. To overcome these, some students verbally told the researcher after class that they thought online discussion should be a required task, rather than a voluntary one as the present time.

Q 2) What is the preferred mode of interaction ***after browsing*** for best interactions?

| | **Preferred Mode of interaction *after browsing*** |
|---|---|
| 50%<br>4groups | A) Face-to-face small group discussion: We can share our opinions immediately and can present our information accurately. Everyone has the chance to speak English! Also, it is the best way of interaction because communication is simultaneous and we can avoid misunderstanding. |
| 25%<br>2 groups | B) Real time Chat is the best way. We do not have pressure and it is very convenient for us to have interaction with others. |
| 12.5%<br>1 group | C) Debate in small groups: We could separate the whole class into 4 groups and have four debates. It could develop our critical thinking a lot in smaller groups of debates. |
| 12.5%<br>1 group | D) We think a combination of face-to-face small group discussion and online discussion would be good ways to critical thinking. Face-to-face discussion could supply more time to discuss and analyze our thoughts together. Online discussion could give us more space and time to calm down and write down the opinion sufficiently. |

Half of the students preferred face-to-face discussion for immediacy and accuracy in interactions, while the other quarter favored real time chat for its immediate interactions with all group members at the same time. The rest split to two creative suggestions: debate in four smaller groups for higher participation rate and a combination of face-to-face and asynchronous online discussion to best develop interactions and critical thinking.

Q 3) How could the teacher better help your critical thinking?

| | **Group Suggestions for increasing interactions & critical thinking** |
|---|---|
| Topics & Q | Providing news articles is quite useful, but sometimes the questions are too political. Our suggestions for increasing online interactions are: posting **more discussion topics** and more links on relevant articles so that we will have some comments to share. //It is better not to focus only on political issues because everyone has his own stance. It is subjective to express opinions as there are some articles not considered objective. |
| Lab | The best way to increase online interactions is having our class in the computer room. Everyone has a computer to share opinions at the same time. Teachers can encourage students by adding extra points and making online discussion a part of final grade.// We think teachers have to **regulate students to participate in online discussion.** |
| Search online | We think **searching online, discussing** and answering questions will be better than writing summary and presentation on the limited issue, as every group works on the same questions for the same articles. |
| Reading skills | We think that the teacher could help to develop our reading kills to grasp the meanings and the main idea of the articles quickly. |
| Post Q earlier | Please **post** the discussion **question one week ahead** so that we can consult some reference information before class. In this way, we may be more prepared and have more ideas and opinions to share in class. |
| Discuss Opinion | We think the teacher can discuss with us together. If we have any problems or questions, we can easily get accurate answers from teachers. // We hope the teacher can tell us about her opinion and other people's opinions about the article & we still prefer face-to-face small group discussion. |

## Appendix 6 Focus Group 1

The first focus group of the online discussion was conducted on the eleventh week with seven online posters overlapping with three debaters in the previous class. The questions catered at this focus group included

1. Online participation and discussion frequency
2. Cross-referencing patterns
3. Silence at conflicts, & critical thinking online
4. Facilitating techniques used by the researcher & impacts of these techniques on students
5. Suggestions for better interactions and critical thinking

The first focus group of the online discussion was conducted on the eleventh week with seven online posters overlapping with three debaters in the previous class. One student turned out by herself without my invitation. The seven students were the first posters in the first two online discussions by the time the researcher planned for the focus group and recruited the focus group members. Six more students participated online by the time the focus group was conducted.

There were a series of questions.
Q1: Online participation and discussion frequency:
Students expressed that online participation was related to several factors. The first one was the closeness of the existing student-student relationship. As students became more familiar with one another in the face-to-face class environment, they became more open up in an online forum to discuss issues.

Secondly, the degree of students' familiarity with the issues also influenced students' participation. Students need sufficient background knowledge before posting their opinions and judgment online. The example was that the social phenomenon of betel nut beauties was more popular than the abstract term of Taiwan value and foreign policy. Cognitive output largely relies on the amount of existing cognitive input students installed in mind and the cognitive processing of these information into their own evaluation.

Thirdly, students needed motivating topics to stimulate their interactions. The topics of this advanced reading course concentrated on political issues. The reason of this political orientation was that the teacher was a PhD. of political science and would like to cultivate students' sensitivity to current issues and political environment. Students expressed a need for a variety of issues to draw their interests and curiosity in voluntary online discussion. Some students recommended making online discussion compulsory for all students and offering extra bonus points for active online participation.

In addition, the clarity of teacher's discussion questions and the implied responses were the third factor that influenced online participation. Students noted that they attempted to grasp the desired answers to teacher's question and sometimes the discrepancy of teacher's expectation of a larger context and students' focus on a single event led to students' confusion. Take the previous experience of the foreign minister's improper wording as an instance. The incident was students' focus, while the teacher's desired question was the government's official apology after the incident and the larger context of relationship of Taiwan, U.S. and China in the recent APEC meeting. There were at least three layers of this issue and the students found the need to be more secured about whether they were on the right track of the discussion.

Fifthly, teacher's style was also influential in students' interactions both in the face-to-face interactions and online forum. The directedness and the authoritativeness of the teacher somehow dominated the direction of students' responses. With rich experience in political science and a clear partisan preference, the teacher tends to prefer certain answers analyzed in a model and from certain aspects. Students sometimes felt teacher's dissatisfaction and hesitated to respond, resulting in a lack of confidence in tone, volume, posture, and eye contact, which would lead to teacher's questioning of students' enthusiasm and level of efforts in the discussion. The teaching style was suggested to be more open and liberal to answers different from those of teacher's to guarantee students' honest expression operating on more than one set of frameworks first in class and then online.

In conclusion, existing relationship among students, degree of familiarity with the issues, motivation towards the issues, clarity of the discussion question and the teacher's style all influenced students' classroom participation and interaction frequency online. Nevertheless, students did not perceive an obvious different interaction pattern in classroom after the online discussion pattern for they felt culturally improper to expose themselves in public and challenge the class authority, teacher. A priority for face-to-face interactions as online interactions was that the learning environment was perceived open and affectively supportive. Critical thinking thus involved first affective, then cultural and later cognitive factors in the development process.

Q2: cross-referencing patterns

Students tended to comment on others' postings in cross-referencing patterns in the beginning stage of the online discussion. The researcher-facilitator posted the initial question as the starter with some reference hyperlinks and the first responding student commented on the starter posting while the others cross-referenced previous ones. Nevertheless, when the links were numerous and the postings accumulated to a certain amount (more than a dozen), students may not follow the different discussion threads evolved from students' responding and selectively respond to more favored posting. Most of the time, the jumping situation was simply answering the starter posting without cross-referencing previous postings.

The issue of betel nut beauties was a good example. The original starting question was why betel nut beauties, not betel nut o-chi-zan and whether there was a problem. As the first few postings responded similar answers, the researcher asked how they would cover the issue differently from the foreign author. The second thread was an analysis of the change of family structure and moral values on the exposure of female body. The third thread was a response to students' posting that asked how much betel nut beauties earn and how long they stay in business on average. The fourth thread was also a response to a student's comment on the salary of betel nut beauties that who would not want to be one of them and asked if given a chance, whether they would rather be one and why. At this turn of discussion, some students still posted the starter question on why betel nut sellers were young girls, rather than if they would work for this industry. This example showed that online participants at the middle or final stage of online discussion tended to lose attention span to go through all postings, thus selectively responded to a more desired thread or more available question. Some students found an efficient way to only click into the reply postings to save time by reading the original posting quoted and replied within a later posting. Cross-referencing was over all a preferred interactions patterns when time allotted for this online work and Internet access was not under constraint.

## Q3: Silence at conflicts, & critical thinking online:

Conflict management was an issue that the researcher was particularly interested to explore in an EFL Taiwanese college context. The first vibrant confrontation online occurred on week ten after the face-to-face class debate. The online discussion extended the class debate and built up extensive discussion of affirmative and negative sides. Two students disagreed with each other's viewpoint fervently. They both provided evidence to support their claim. After the one of the negative side in the issue posted sharp criticism with many links to support the claim, the one supporting the affirmative side criticized the other student's gesture in the open floor during a debate two weeks ago in the final stage of the online

discussion. The latter responded with sarcastic thanks for the comment. At this point, the online discussion was stuck and students did not post anything for a while. Most students indicated that they would avoid to comment on postings supporting the other side, not to mention to challenge an online debating rival in intense conflict like this. Students were more cautious in online discussion than in small group conversation in the face-to-face environment for the characteristics of permanent retrieval and openness to comment of the Internet medium. This implication of Taiwanese students' restraint from public confrontation was similar to the practice and mentality of the Confucius Heritage Culture. However, the cross-examination online was generally found an effective way to discuss controversy point by point, thus a means for fostering critical thinking.

Q4: the techniques used by the researcher to facilitate the discussion and the impacts of these techniques on students.

The researcher exercised several techniques. The first technique used was "supporting" aimed to encourage students' online posting. It was shown in different forms, including praising online in E-course, asking and calling online posters by their names, encouraging individual poster in face-to-face context, padding shoulders, smiling to presenting students, verbally inviting the presenting groups to post their brilliant ideas online, e-mailing to all the hyperlinks for the next round of discussion in advance from the E-course system, e-mailing to the student who missed the class to show care and e-mailing to the groups who either felt teacher's satisfaction or dissatisfaction for their class presentation of ideas on the issues. The task was similar to a shepherd to care for the sheep who may or may not be aware of their potentiality and the vision needed for possible development in the future. Some students indicated that they felt glad to receive the e-mail of invitation to post their group ideas online, but by the time they finally logged online, the memory retention of the ideas was limited after a week or so. The technique was not directly responded, yet the positive reinforcement was functioning and contaminating more students with the researcher's continuous presence in the face-to-face learning environment.

According to a student who responded the effectiveness of these online techniques in e-mail, the first strategy of supporting was very useful and that the researcher did a great job in encouraging. "It is very true that encouragement and relationship take a big part in on-line discussion. If people think their messages are appreciated or draw many attention, it gives them the feeling of relativeness, and therefore they will be more willing to express themselves," the student wrote.

Another technique utilized by the researcher was "suggesting" meant to broaden students' perspectives and provide possible alternative of sources for further exploration of an issue. In the second online discussion on whether environment and development were Taiwan values, a suggestion was later made by the researcher on whether there was a possibility to balance between ecology and economy with the concept of sustainability. In response, some students made the distinction of human needs from human desires as the key point in the issue of the development or the exploitation of the nature environment. The second example was the suggesting the real biblical concept of nature and human beings. When a student posted a dilemma in the second discussion about environment and development by stating that our natural environment was God's creation, but we could not survive without developing the environment, the researcher responded by quoting the scripture of the maintaining and management of the earth in Genesis and the Jubilee year needed for the nature to rest and flourish in Leviticus. The concept of sustainability was suggested in this quoting. Students moved on from the understanding of the issue to the core of the discussion. The "suggesting" strategy was also considered useful. Further exploration from the facilitator's "suggesting" helps students to go into deeper concepts.

The other technique was "interpreting," explaining the meaning of a new concept in details. The first example was the researcher's interpreting of the teacher's "Taiwan value." While most of the students were confused, the researcher explained the term in simple words modifying the Oxford dictionary's definition of "value" by describing it as something considered important, cherished and valuable by people. Students took a while to grasp the idea in concrete policy to represent people's value such as money values, educational emphasis and senior pension offered by the government for social security. The "interpreting" was perceived highly helpful and even essential. A student expressed, "It is very difficult for students to talk about something they don't even understand, not to mention discussing about it."

The following technique was “challenge or probe,” aimed to question some concepts, validity of the evidence or the assumptions of the statement posted online. In many cases of students’ intuitional responses to express their personal opinion, the researcher waited for more than a day and challenged their evidence to support the claim after praising their online participation in supporting technique. In the second discussion, a student from the negative side rushed to a conclusion that eighty percent of the government policy was mainly for the interests of the manufacturers and the special interests groups without citing the source. The researcher questioned the source and the validity of the statistic used to support such a claim. The poster later did not respond anything for furthering search by evidence, yet the other member in the same group commented the rival group’s debate points by evidence of experts shown in several links: each to refute the other group’s points. The impact of “challenge or probe” was not obvious and at this stage, not responded by the posters themselves, yet brought the class’ attention to the critical thinking needed in reaching a logical conclusion by presenting credible evidence. A student indicated that this strategy was the most important part regarding critical thinking development. This student perceived that the researcher felt slightly disappointed by the result, yet she added that: “Developing critical thinking is never easy. Besides, the efforts paid by students themselves are also required. Don't be frustrated, what you are trying might help us a lot in future.”

The next technique used was “emphasize” meant to make efforts to point to a particularly different reference works or thinking pattern. In the final stage of the first discussion of the betel nut beauties, the researcher responded to a student’s comment not desiring to be a betel nut beauty for the vulgar outfits they wore to attract male customers by posting some links. These links provided both the betel nut beauties’ storytelling of why they came to join this business and the photographs showing how they stood by the streets in their peculiar outfits to elicit motorists’ to stop by in highly competitive market. The reference was emphasized the socio-economic condition of these young girls’ families was different from the social norms that many of them did not finish high school education to obtain a decent job that helped earn enough to maintain the lifestyle they desire to stay “in” fashion. The impact was not easily observed, but more understanding was generated about why some people behave and think in certain ways. Confusion occurred about the "emphasizing" strategy which was perceived as similar to helping students to look at things at different sides, to put themselves in other people's shoes.

The final technique was “linking ideas,” used to integrate and incorporate different perspectives in postings. The researcher linked a group’s response of socio-economic shift in the discussion of betel nut beauties with the pattern they were drawn to the business and they stayed in business as the next discussion thread. Also, at another student’s comment on the high salary of the betel nut beauties, the researcher linked the lucrative concept of whether they would like to be betel nut beauties if offered with the high salary posted by themselves online. The student did not quite understand the difference between suggesting and linking ideas, thus did not investigate further. Suggesting was used to introduce to new ideas not mentioned, while linking ideas was used to incorporate different ideas already mentioned in discussions. Maybe the illustration the researcher used was not clear enough.

Q5 suggestions:

1) Teacher’s attitude in probing and challenging students’ lack of evidence or specific information the teacher required in their argumentation to support a claim
2) Discussion questions and links posting a week in advance to allow cognitive processing to respond to cognitive complex discussion questions
3) using lab time more effective by starting the class there so the class may finish lab registration for fuller use of the first lab hour

## Appendix 7 Pre-Focus Group 2 Group Interview

This appendix recorded the results of group interview which was conducted a week before the second focus group. Three online members who participated in this group interview were chosen because they posted opinions in online discussions yet were quiet in face-to-face class. The issues discussed included:

1) How to best mix different modes of f2f and online for s-s interactions & critical thinking, Browsing—pair, f2f/ Real time Chat—Asyn—Debate or Debate-like presentation (in which 3 on a side or 8 presenters comment on previous group)

2) Conflict management: remain silent/ post, but avoid cross-reference/ comment directly/ comment only those you aren't familiar or comment other class online & f2f

3) How a teacher does to encourage critical responses online & f2f:

4) Suggestions for next round of discussion on 3 first ladies? Next semester?

**Selection of the three students**

These three students were particular participants in the sense that they did not volunteer to express opinion in face-to-face class discussion environment, yet posted opinions in online discussion. Each had a special story:

The first one is a male student who addressed a point of view that caused the first conflict online with the most active online participation student. He also criticized the most active student's strongly for exaggerating gesture to emphasize her viewpoint in the classroom debate floor that attacked his side of debate points. However, the result was that the most active student replied shortly for acknowledging her gesture and coincidently did not come to this class for three weeks. As a result, this male student later regretted to confront with her and wrote her an apology e-mail to express his good will after breaking the cultural norm of social harmony. She replied that it was nothing serious and that her absence was not because of his online criticism, though she also asked another student in the lab whether her behavior was outrageous to the rest of the class. One week later, the student returned to class, yet this male student did not post any message online ever since, implying his repulsion over revealing political inclination in any discussion. The researcher observed his unwillingness to devote and verbalize opinions in the controversial issues that often caused confrontation between students of opposite political lineup.

The second student is silent girl, a term she called herself in e-mail address. She was quiet, sitting silently at the left corner in the back of the classroom. However, in the second online discussion, after she asked a question online concerning the meaning of Taiwan value on week six, she received verbal encouragement from the researcher and became an active participant after her online message was later put up on class screen in the next class session. With the "supporting" technique online and positive reinforcement, she volunteered to be the judge of the classroom debate and participated more than one time in each of the following five online discussions. In classroom discussion, she remained quiet. Her online participation revealed possibilities of cultural de-construction for females to remove from silence to active advocating in an online discussion environment.

The third student W is a student who had e-mail communication with the researcher after the e-mail to all technique was used to invite more online participation with extra bonus points on week eight. She seemed to be shy in class, yet after expressed to me in e-mails her willingness to change from a reader to a poster in the online discussion, she fulfilled what she said to ask questions and post opinions online. When people had confrontation online, one time she sought to balance between two polar views of weapon purchase while in the second time she posted her view after reading a series of intense online confrontation that no apology was needed in online discussion for the downgrading of the first lady of Taiwan in Para Olympics by communist China's manipulation. Her growth in courage and cognitive maturity made shocking breakthrough to the researcher that a shy girl could change dramatically in communication patterns towards critical participation through a technique researcher used to foster participation.

1.How to best mix different modes of f2f and online for s-s interactions & critical thinking, Browsing—pair, f2f/ Real time Chat—Asyn—Debate or Debate-like presentation (in which 3 on a side or 8 presenters comment on previous group)

One suggestion was that prior to the during class online browsing, most students needed to read the required reading posted on E-course for cognitive preparation before engaging in any online discussion. The researcher also asked whether students preferred to contribute the links they found on E-course or they preferred to read the links selected by the researcher. Students replied that in complex political issues, students may find dozens of articles, yet without the

knowledge of which may be biased or inadequate, thus student posting links may lead to a chaos. The links selected by the researcher provided a scaffold or structure for students to understand an issue from different perspectives and different angles. Adequate cognitive input served an important base for students' interactions in f2f and online learning environment.

A model suggested by the students was Browsing, Rea-time Chat, Group posting on Asynchronous Discussion, Small Group Discussion, Presentation or Debate. The model was to start online browsing in time and launch real time chat online within each small group after 25 minutes of online browsing at 1:30. After 20 minutes of chatting about the problem points and group members' opinions, each group posted a group message on the asynchronous online discussion board 10 minutes before the end of the lab session 1:50. Students may read other group opinions online for ten minutes and decide what to comment on in the later classroom session.

Other suggestions were made to increase motivation, encourage participation and variation of presentation. The methods included students' selection of topics, students' creation of discussion/debate questions and equal participation of group members in presentation.

Another issue mentioned was Anxiety of speaking true opinions about the perceived overly political discussion.

2. Conflict management: remain silent/ post, but avoid cross-reference/ comment directly/ comment only those you aren't familiar or comment other class online & f2f

Two students expressed that they would not directly confront someone with an opposite opinion, but some would still address their true opinions in an indirect way or cross-reference someone with a similar opinion. In a situation of the non-research class student L, confronting with those unfamiliar ones did not pose affective difficulties in classmates interrelationship after the online disagreement. They generally did not like to comment on this issue.

3. How a teacher does to encourage critical responses online & f2f:

One thing that the students named was the "supporting" technique of the teacher in response to students' expression of their true opinions, with some positive reinforcement for their contribution and eliciting more responses from other classmates. This positive teacher-student interaction factor would influence the perceived class atmosphere and teacher' style which would in turn influence students' willingness to share opinion or risk to expose themselves.

The second technique was helping each group clarify their problem points by going around the class to each group and observe their problem points to better use technique such as "suggesting."

The third technique recommended was "interpreting" the meaning of the discussion questions like "Taiwan Value," and the perspectives of certain stances.

The fourth technique was fostering "volunteerism" to create an open discussion atmosphere and forum first in f2f learning environment. This atmosphere could be fostered by required number of times of participation during a semester at first. Students would gradually develop the habit of expressing opinions and volunteer to further involve and contribute to class discussion issue.

The fifth technique was allowing students' topic selection and discussion questions selection as fostering student autonomy.

The sixth technique was understanding the needs of the sheep as a shepherd. With better understanding of students' current needs, individual levels of English proficiency, difficulties in comprehension and offer feedback on the weakness observed in their homework, teachers may provide students better guidance to follow the thread of class discussion.

The seven technique was "linking" different points. When students have diverse opinions about an issue, linking different ideas in a new perspective would provide opportunities to further explore an issue and help students' to see the advantages of different viewpoints.

The eight recommended technique was "concluding" or "evaluating." Students hoped to see a conclusion by the teacher to summarize the pros and cons of a topic after students' debate or presentation. They thought that the teacher's professional training in this field would cut in these issues differently from them, thus it would be inspiring to hear teacher's final words after they express their opinions. The researcher added that it may be the teacher's belief of student autonomy in expressing opinions and that the teacher's equal voice to that of college students'.

The other techniques suggested by the group dynamics theory such as Emphasize and other techniques for fostering critical thinking including Probe/challenge were not mentioned. The techniques used in real time chat such as self-expose, saluting suggested by Kung (2003) were not particularly mentioned. The skills Yu and Chou (2004) used for stimulating metacognitive thinking such as cognitive modeling and compare and contrast were not named in this group interview.

4. Suggestions for next round of discussion on 3 first ladies? Next semester?

Students finally suggested that using videotapes, VCD or DVD and PowerPoint slides on relevant issues of the reading topics could better illustrate complex topics and foster thinking. If there are audio-visual aids for the three first ladies of the lesson, the understanding would be improved and discussion may be enriched. Humor was also suggested in making those topics relevant to these college students.

## Appendix 8 Focus Group 2

This appendix illustrated the data collected in the second focus group which was conducted in week fifteen on Dec 30th, 2005 on 1) how to best mix face-to-face and online models to foster critical thinking and interactions, 2) what techniques best help critical thinking, 3) how to manage online conflict and 4) whether modifications made after focus group one have increased student-teacher and student-student interactions and if any other suggestions could be made for next semester.

The following is the first question of how to best mix models for critical thinking in different mixture of face-to-face and online discussion modules:

Online Browsing: O refers to a student while [O O] refers to two persons sharing a computer for browsing. Each student using a computer is represented by [O] .

1A. Pair browsing [O O] : favored by few due to students' different reading speeds and the physical closeness of students in the lab configuration allowing students to discuss some issues.

1B. Individual browsing [O] [O] favored by more students due to the autonomy

1C. Reading links posted by T or students' own selection

1D. Searching by keyword and sharing (like First lady Wu & foreign policy)? Start with 1) online browsing for 20 min, then start to

2) chat online within small groups for 2o minutes, 3) group idea postings on bulletin board for 10 min. The last 10 min is for all to 4) read other groups' ideas and comment on them. Real time chat mode: synchronous online chat mode was meant to warm up students' thinking and clarify students' problem points, yet not highly recommended for critical thinking due to many reasons.

- Final Presentation Configuration

4A. Teacher randomly selecting some groups to respond certain questions or Debate: debaters as 1) volunteers from each group, 2) drawn lots among students or 3) selected by the teacher by random numbering.

- After class Online discussion

Any online techniques used by the researcher or students that helped our discussion and critical thinking?

- Q4: To what extent students perceived they were able to achieve the critical thinking based on the operational definition of critical thinking in this research? The following was a summary presentation of students' opinions:

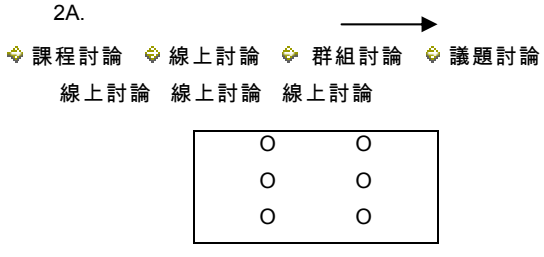
Start with 1) online browsing for 20 min, then start to 2) chat online within small groups for 2o minutes, 3) group idea postings on bulletin board for 10 min. The last 10 min is for all to 4) read other groups' ideas and comment on them.

Some students approved of the model to mix online browsing before chat and asynchronous discussion. On the other hand, some expressed the habit of students pondering on what to post till the very last minute of the lab hour, minimizing the chance of reading and cross-referencing other groups' messages for student-student interactions. In response to that tendency of posting delay, one possible solution was to shorten the in-class browsing time and directly require group idea posting online in class within the beginning 20 minutes. Another possible suggestion was requirement of reading all the links in advance, so that students may start discussion on an individual base. The strictest requirement could be asking students to finish all the online reading and post individual or group opinions before class. However, this was unlikely to implement as a student pointed out that the focus group participants were the most active and motivated ones, thus this suggestion may not work out for the entire class.

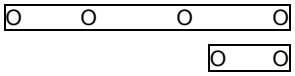
Some suggestion on the following two hours of class in the classroom setting was that the whole class may read the demonstration of some groups' postings from the screen and start class discussion from there. This could be effective as concrete visual-aid for small group discussion, yet lose the chance of individual replying the group postings and cross interactions for critical thinking.

2. Real time chat mode: synchronous online chat mode was meant to warm up students' thinking and clarify students' problem points, yet not highly recommended for critical thinking due to many reasons. One of the reasons was that the format of chat brought the entertaining function of MSN that students were often at chatting mood for issues not related to the topic. Some criticism was the lack of purpose in chat and the waste of time in meaning negotiation by typing in English while they sat by each other and could have face-to-face clarification of questions. One complaint was that the chat room was not user-friendly in that it was one of the features under small group discussion and it was slower than chat on MSN. As for the other function of E-Course to allow real time chat cross different groups of a class, students' overall perception was that it was more effective in asynchronous bulletin board discussion for whole class online discussion than chatting within each group or among the class for clearly and purposeful mental expression. Students could take time to read and re-read to understand other classmates and other groups' messages and links in postings before they construct their own messages of reflection and responses at ease.

2A.




2B.




3. Face-to-face small group discussion back in the classroom: students expressed that the major problem was equal participation and involvement among the three options of volunteering, presenters selected by the teacher in randomly drawing lots, or rotating to present discussion results. Some students were at ease for weeks because their groups

were not selected by drawing while others complained that they were asked to present three weeks straight either by teacher's drawing lots or by the lot-drawing within the groups.
Another phenomenon was that only the foreknown presenters focused on discussing the issues while the rest chatting on irrelevant topics such as department store sale. Presenters encountered lack of social support after knowing other members were not the "lucky one," decreasing motivation for further discussion. In response to this, one suggestion was made that after fifteen minutes of discussion, two groups merged into two new groups composed half by each group for another fifteen-minute discussion before presentation. In this way, three members of each group would be representatives to present their ideas to the other group three new group members. The new make-up of groups would bring some social support from the original group while enjoying the mental exchange of social constructivist approach with the new group members. The mixing of different groups seemed quite interesting like jigsaw, yet some reservation was made on how effective students would open up themselves to share opinions in English with new members.

Whether it was model of student-selected presenter of 3A/3C or teacher-selected presenters of 3B, one issue was that those who were less verbal needed to have equal chance to share in class. Rotating may be a possibility to encourage equal critical participation during class discussion, so that those who have not shared before would have the chance to practice.

(S representing students volunteering while T referring teacher selecting students as representatives at the end of group discussion, indicating equal participation in discussion)

3A. S ☻00 000 3B. T ☻00 000

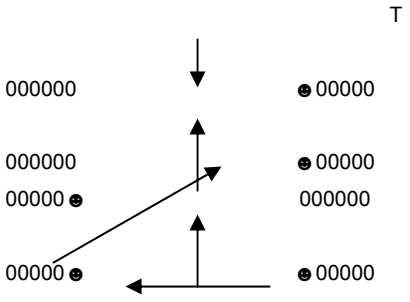
3C. Students assigning tasks among themselves

Two students discussion one article O O
the other two discussion on another O O while the rest of the group focus on summary presentation.
S ☻ O

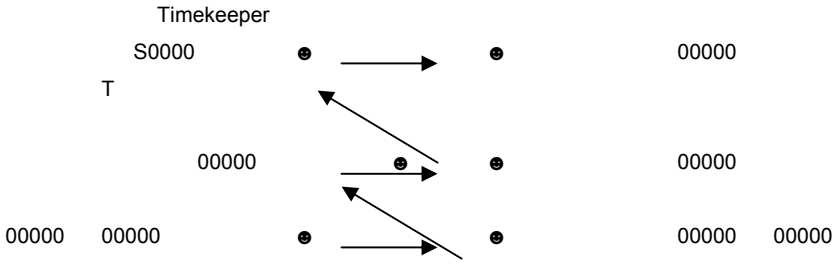
In this model, students found that it was the content of discussion that mattered most, rather than who among the six was assigned to focus on which article. An overall perception was that summary of the reading was repeated, thus unnecessary of presentation time. Summary of required reading and closed-ended questions in the beginning of the semester were not favored by students. They suggested open-ended questions for diverse opinions shared by students in different groups.

4. Final Presentation Configuration

4A. Teacher randomly selecting some groups to respond certain questions and requesting them to comment on the previous group for the discussion topic. Students found this model efficient by not having all groups to share, yet the teacher needed to memorize which group was called in previous class session so as to prevent unequal chance of presentation of certain groups.



4B. Debate: debaters as 1) volunteers from each group, 2) drawn lots among students or 3) selected by the teacher by random numbering. Students expressed the need for longer preparation for a well organized debate on controversial issue. Suggestions included 1) informing debate questions one week ahead in the previous class for better cognitive input, 2) assigning siding before online browsing so that lab browsing could be more focused and effective in searching and taking notes on the evidence needed to support a claim, and 3) better language support during the preparation period by providing essential phrases, terminology and teacher's supervising of English-only small-group discussion. Some students became debaters not by will, but suddenly by luck. It was not that they did not participate in discussion, but that the intense discussion was all in Chinese, thus students needed advanced English proficiency to be able to organize different group ideas in their debating posts (first, second and third debaters) and simultaneously translate the ideas into English with good, clear presentation techniques and full confidence. In view of the fact that some debaters could not be clearly understood, EFL factor and presentation techniques were found determinant in successful English debates other than sufficient information from all sides and critical thinking.

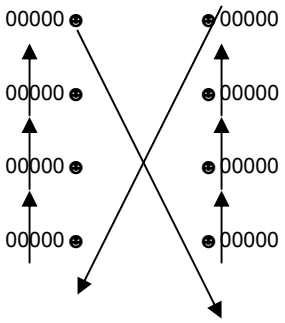



Some students who were in the floor found the hostility overly strong in debates, breaking the social norm of harmony in Chinese mentality. In this debate model, debaters were not physically connected and supported by the groups; two small groups did not have representatives in the debate. The debate floor was open to invite other students' questioning, and challenging. However, other students said that it was because classmates did not adapt to the debate culture which was meant to clarify complex issues and allow open discussion as a learning community. An important issue was that it was not to be taken personal after the debate was over. Chinese students tended to reserve openly oppose an opinion supported by a fellow classmate within the face-to-face class environment.

Nevertheless, students dare challenge online posters from the other class. A vibrant online poster from the other class confronted with one of her former roommate without reservation. The online confrontation was intense to a point that certain classmate posted one line just to support her classmate's viewpoint. While the rest of the focus group members were so impressed by who this person was, this student disclosed: "My hatred towards this ex-roommate stirred up strong motivation to launch another search online before refuting her point by point in the discussion board." This self-disclosure was shocking to the focus group that the first critical confrontation after the accusation within the class debate was sparked by even negative personal relationship. The first confrontation was in the weapon purchase after the researcher e-mailed to all, including the other class and more online confrontation was aroused in the following discussion of the current first lady's trip and the downgrading of status by China's blocking. Positive relationship within the class may encourage group mates to post and refrain direct confrontation by students within the same class while negative relationship also played an important role in furthering online confrontation cross classes.

4C. Semi-Debate Configuration: 1) each group sends one representative sitting in front of the group who 2) presented the group points and commented on the positive and negative points of the previous group, while eight judges are drawn by the teacher to 3) evaluated each group representative's content, pronunciation, positive points, negative points and suggestions for each.

In this following graph, J refers to student judges.




JJJ T

JJJ

JJ

In this model, students' participation and attention level were high, but the content repeated among eight groups. Students' perception of the model was positive in that each group had equal participation and student-student interactions were encouraged within the groups as they sat nearby to support the presenters. One suggestion was made to avoid repetition of similar content by having free and open discussion questions for more diverse discussion content sharing. The repetition here referred to the presentation of the students' perception of the first lady, yet most groups repeated facts about her birthplace, family background, education and marriage perspective, rather than their "perceived" first lady. Distinction of facts and perception was unclear, so the sharing was a summary-like presentation, thus not much challenging comment on previous group was made.

Despite some limitations in each model, students expressed the excitement of having different models each time, varying between small group discussions, debates and semi-debate presentation.

Summary of Model Mixture:

No mixture module was perceived as the best model, yet alternating between different modules at different stages could create diverse results of interactions. If this week was randomly calling for presentation, next week could add in the mechanism of commenting on the previous group after having presentation for better student-student interactions. Question-setting to stimulate good discussion with teacher's affective supporting were essential no matter what modules to be deployed.

5. After class Online discussion

Any **online techniques** used by the researcher or students that helped our discussion and critical thinking?

Supporting: This technique of offering positive reinforcement of students' sharing was perceived the most effective and affective in encouraging students to express their opinions in the face-to-face discussion and inviting more students to participate online. Occasionally, the teacher was anxious to solicit a definite answer to support a stance, but the message that students received was that the teacher leaned towards a certain response, not desiring to listen to students' responses to the open-ended questions. An example was that the teacher questioned three groups to get the desired response about the foreign minister's improper wording, diminishing students' perceived ability and confidence in openly discussing controversial issues and breaking the social harmony.

Students also acknowledge that the teacher was quite friendly in private, yet seemed to pose a directive authority image on the podium. Some techniques utilized by the teacher were talking to students after class, chatting with students about her new publishing and smiling to the students who came to her for questions. Other techniques used by the researcher included 1) praising online in E-course, 2) asking and calling online posters by their names, 3) encouraging individual poster for their online postings in face-to-face context, 4) padding their shoulders for debate performance, 5) smiling to presenting students during and after presentation, 6) verbally inviting the presenting groups to post their brilliant ideas online, 7) e-mailing to all the hyperlinks for the next round of discussion in advance, 8) e-mail existing online posters E-course system, and 9) e-mailing to all for the discussion topic of the week for extra marks, etc…)

## Appendix 9 Course Syllabus

文藻 

外語學院九十三學年度第一學期教學綱要

Wenzao Ursuline College of Languages

Syllabus for the Autumn Semester of 2004 Academic Year

| | | |
|---|---|---|
| 學 制<br>Educational System | **日間部 Day School**<br>【 】專科部 5-year Junior College<br>【x】二技部 2-year College<br>【 】四技部 4-year College | **進修部 Division of Continuing Ed.**<br>【 】二專部 2-year Junior College<br>【 】二技部 2-year College<br>【 】四技部 4-year College |
| 科目名稱<br>Subject | Professional English Reading | |
| 學分數<br>Credits | 3 | 必修 Required course【x】<br>選修 Elective course 【 】 |
| 一、 科目概要（Course Description） | Well-written articles from renowned newspapers and journals covering a wide spectrum of issues of Taiwan will be studied and discussed in class to enhance the skills of critical reading. Academic articles are provided for reading and comprehension. However, feature articles on various aspects of Taiwan and various topics will be provided to train the reading skill of students before they plunge into academic works. We will also be reading to sharpen the ability to absorb information and ideas. | |
| 二、 教學目標（Course Objectives） | ● To broaden advanced vocabulary<br>● To enhance the skill of comprehension during reading.<br>● To encourage students to question accepted norms, views, and myths.<br>● To enhance the width and depth of thoughts and expression stimulated by reading.<br>● Reading in context is also a skill the students should acquire from this course.<br>● To motivate the ability of reading as means to lifelong learning. | |
| 三、 Evaluation Criteria | Final Exam 40%, Individual Reading Report 30%<br>Presentation15%, Class Attendance & Participation 15% | |
| 四、 課堂要求（Course Requirement | Preview assigned materials by everyone before coming to the class is essential.<br>Full participation of classroom activities is expected.<br>Students must attend at least 75% of the classes | |
| 五、 教科書（Textbooks） | News items and feature article from newspapers are selected as reading texts. All the reading articles can be obtained in the “Pro-Quest ABI/ARL”,”Wisenews” and “Lexis-Nexis “ searching programmes in Wenzao’s library. | |
| 六、 指定參考書目 9References） | All the reading articles can be obtained in the “Pro-Quest ABI/ARL”, “Wisenews”and “Lexis-Nexis “ searching programmes in Wenzao’s library. | |

課程內容與進度（Course Content & Progress）

* 請詳列每次上課進度

* Please list course content & progress based on each session meet with students!!!

| 上課日期<br>Date | 課程內容<br>Course Content & Progress |
|---|---|
| **1st week** | Introduction: on methodology of reading |
| **2nd week** | On Taiwan's University life: |
| **3rd week** | On Taiwan's Art: Dance: 1.International Herald Tribune (Herald Asahi) 2. GIVING NEW LIFE TO SEASONED ART FORMS |
| **4th week** | On Taiwan's Art Exhibition & national Museum<br>HE BIG TRIP: WE PACKED UP OUR CULTURE |
| **5th week** | On Taiwan's Social Issues: 1.UNIQUE 'BETEL NUT BEAUTY' 2. TAIWAN HOPES TO ATTRACT EUROPEAN TOURISTS WITH HOSPITALITY |
| **6th week** | **On Taiwan's High Tech:** |
| **7th week** | On Taiwan's Value:1. YU HIGHLIGHTS VALUES FOR TAIWAN 2. TAIWAN PREMIER ANNOUNCES LOW-INTEREST HOUSING LOANS |
| **8th week** | Taiwan Develops the South: CENTRAL TAIWAN DEVELOPMENT& NEW PROMISES |
| **9th week** | **On Cross Strait Relations:**<br>1. Taiwan-China tensions over referendum, TAIPEI, 2. Taiwan corp. stumbles in Beijing |
| **10th week** | 1. Taiwan's Foreign Relations |
| **11th week** | Taiwan's foreign Relations: w/ Israel, Russia<br>1. TAIWAN, RUSSIA's TRADE AGREEMENTS 2. ISRAELI CALLS ON TAIPEI MAYOR |
| **12th week** | Taiwan's Purchasing of Weapons : TAIWAN YET TO RECEIVED US RESPONSE ON ARLEIGH BURKE-CLASS DESTROYERS 2. Taiwan analysts view bid to purchase destroyers |
| **13th week** | 1. Taiwan's Purchasing of Weapons:VIEWS MIXED |
| **14 week** | **The First Lady's visit**<br>1. TAIWAN FIRST LADY ARRIVES IN BERLIN2. Taiwan's first lady's visit |

## Appendix 10 Information Letter

Title of the Project: **Critical Thinking and Online Interactions in a TAIWAN EFL College Course**
Name of Staff Supervisor: Assoc. Prof. S.E. McNamara
Name of Student Researcher: Yi-Ching Jean CHIU
Dearest Students,

This letter requests your involvement in the research I am undertaking as part of my EdD studies.
The purpose of the research is to explore final year tertiary students interactions and critical thinking in an online environment.

In my research I am seeking to explore on-line student interaction patterns; to investigate the characteristics of critical thinking demonstrated online and the types of critical thinking demonstrated. My analysis will predominantly use the messages posted to the discussion, however all individual names and identification will be deleted from the data and reports of the findings will be presented in aggregated forms which do not permit the identification of individuals.

The research employs a qualitative approach and includes observation of face to face classes, observation of the online discussions and focus groups of your perception of the online environment. I would also like your permission for me, as researcher, to use your online discussion messages from the course Professional English Reading as a part of my research. During my data collection I would like to meet with some of you as a focus group and finally I request that all students complete a brief questionnaire at the end of the course. I hope that the results of the study may be published in appropriate journals and academic publications.

If you agree to becoming involved in this study I would ask you to sign the attached consent form. Participation in the study is entirely voluntary and you may withdraw at any stage.

The potential benefits of the study include the better integration of online discussion and critical thinking in faculty courses.

If you have any questions about the study please do not hesitate to contact me, or my supervisor, Assoc. Prof Sue McNamara, Australian Catholic University, Aquinas Campus, 1200 Mair St Ballarat or s.mcnamara@aquinas.acu.edu.au or (Tel) 613 5336 5368

This study has been approved by the Human Research Ethics Committee at Australian Catholic University. In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Student Researcher and Staff Supervisor have not been able to satisfy, you may write to:

Chair, Human Research Ethics Committee
C/o Research Services
Australian Catholic University
Locked Bag 4115
FITZROY VIC 3065 Tel: 613 9953 3157 Fax: 613 9953 3315

Any complaint will be treated in confidence and fully investigated fully. The participant will be informed of the outcome.

If you are willing to participate, please sign the attached informed consent forms. You should sign both copies of the consent form and retain one copy for your records and return the other copy to the student research. Thank you for assisting me in my research.

Sincerely yours, Yi-Ching Jean Chui

## Appendix 11 Number of Postings from Online Members

| Topics | 1 Betelnut | 2 Taiwan value | 3 Foreign Minister's LP | 4. Madame Chiang K.S. | 5. Weapon Purchase | 6. First Lady | 7. Former Pres. Lee |
|---|---|---|---|---|---|---|---|
| Daffodil | 3 | 1 | | 2 | 3 | 1 | 1 |
| Sunflower | 5 | 5 | | | 2 | 8 | |
| Macadamia | 1 | 2 | 1 | | 1 | 1 | |
| Eucalyptus | 1 | 1 | 1 | | | 1 | |
| Margarita | 1 | 1 | | 1 | 1 | 3 | |
| Plum | 1 | | 1 | | | | |
| Olive | 1 | | | | | 1 | |
| Lavender | | 2 | 1 | 1 | | 2 | |
| Palm | | 1 | | | | | |
| Cinnamon | | 1 | 1 | 1 | | 1 | |
| Pear | | 1 | 1 | | | | |
| Rosemary | | 1 | | | 1 | | |
| Peppermint | | 1 | 1 | 1 | | | |
| Tulip | | 1 | | | 1 | 1 | 2 |
| Rose | | 1 | 1 | 3 | 8 | 6 | 2 |
| Peach | | | | 1 | 1 | | |
| A. *Jasmine | | | | 1 | | 1 | |
| *Lily | | | | | 3 | 1 | |
| *Dandelion | | | | | 2 | 2 | |
| *Pine | | | | | 1 | 1 | |
| *Lemon | | | | | 1 | 2 | |
| *Grapefruit | | | | | 1 | 1 | |
| *Chrysanthemum | | | | | 1 | | |
| *Pecan | | | | | 1 | | |
| *Violet | | | | | 1 | | 1 |
| Persimmon | | | | | 1 | | |
| Orchid | | | | | 1 | | |
| Apple | | | | | 1 | | |
| Leek | | | | | 1 | | |
| Watermelon | | | | 1 | | | |
| Cashew | | | | 1 | | | |
| Vanilla | | | | 1 | | | |
| Grape | | | | 1 | | | |
| Fig | | | | 1 | | | |
| Eggplant | | | | 1 | | | |

Participants from the non-research class are marked with asteroids (*)

## Appendix 12 Sample of Online Interaction Chart

This chart used threaded discussion display to illustrate how student participants interacted with one another, the teacher and the researcher. This chart is not in chronological sequence for interaction purpose.

I. Betelnut Beauties

| | Topic | Date | Author | Browsed | Replies |
|---|---|---|---|---|---|
| 1 | Why not Betelnut O-chi-zan? | 04/10/18 | Researcher 1 | 45 | 5 |
| 2 | Re: Why not Betelnut O-chi-zan? | 04/10/18 | Teacher | 36 | 3 |
| 3 | betelnut beauty | 04/10/19 | Daffodil 1 | 32 | 1 |
| 4 | Re: betelnut beauty | 04/10/19 | Sunflower 1 | 24 | 1 |
| 5 | Other than attracting business | 04/10/20 | Researcher 2 | 30 | 1 |
| 6 | Q3 | 04/10/22 | Sunflower 2 | 23 | 1 |
| 7 | Group 5's Q3: how much is earned | 04/10/22 | Researcher 3 | 29 | 2 |
| 8 | Re: Group 5's Q3: how much is earned | 04/10/23 | Sunflower 3 | 21 | 0 |
| 9 | Re: Group 5's Q3: how much is earned | 04/10/25 | Daffodil 2 | 31 | 0 |
| 10 | betelnut beauties' average salary | 04/10/25 | Daffodil 3 | 34 | 1 |
| 11 | Would u like to be ? | 04/10/25 | Researcher 4 | 36 | 1 |
| 12 | Re: Would u like to be ? | 04/10/26 | Sunflower 4 | 26 | 1 |
| 13 | Photos & 7 reasons To be or Not to be? | 04/11/01 | Researcher 5 | 30 | 1 |
| 14 | Photos & & reasons | 04/11/02 | Sunflower 5 | 31 | 0 |
| 15 | Re: Why not Betelnut O-chi-zan? | 04/10/19 | Macadamia | 33 | 0 |
| 16 | Re: Why not Betelnut O-chi-zan? | 04/10/24 | Eucalyptus | 22 | 0 |
| 17 | Re: Why not Betelnut O-chi-zan? | 04/10/24 | Margarita | 37 | 1 |
| 18 | Re: Why not Betelnut O-chi-zan? | 04/10/25 | Plum | 21 | 0 |
| 19 | Why not Betelnut O-Chi -Zan? | 04/10/28 | Olive | 24 | 0 |

II. Taiwan value

| Topic | Date | Author | Browsed | Replies |
|---|---|---|---|---|
| Taiwan Value | 04/10/25 | Teacher | 77 | 2 |
| Re: Taiwan Value | 04/11/01 | Researcher | 71 | 1 |
| identities | 04/11/15 | Lavender 1 | 22 | 1 |
| Re: identities | 04/11/15 | Sunflower 1 | 22 | 1 |
| Identity: to be or not to be part of China | 04/11/17 | Researcher | 21 | 1 |
| Debater's points | 04/11/17 | Researcher | 18 | 1 |
| Debater's points - Agree side | 04/11/18 | Daffodil 1 | 21 | 0 |
| Re: Debater's points - Agree side | 04/11/18 | Researcher | 13 | 0 |
| Re: Debater's points - Agree side | 04/11/26 | Sunflower 2 | 17 | 0 |
| Re: Taiwan Value | 04/11/12 | Lavender 2 | 40 | 1 |
| Taiwan Value: Reconstruction | 04/11/15 | Researcher | 73 | 0 |
| Negative side~~~ | 04/11/19 | Macadamia 1 | 41 | 4 |
| Re: Negative side~~~ | 04/11/22 | Researcher | 26 | 0 |
| Re: Negative side~~~ | 04/11/24 | Palm | 18 | 1 |
| Re: Negative side~~~ | 04/11/25 | Sunflower 3 | 11 | 0 |
| Re: Negative side~~~ | 04/11/28 | Cinnamon | 16 | 0 |
| Taiwan Value | 04/11/29 | Tulip | 11 | 1 |
| Re: Taiwan Value | 04/11/29 | Rose | 8 | 0 |
| agree side | 04/11/24 | Eucalyptus | 26 | 2 |
| Re: agree side | 04/11/24 | Sunflower 4 | 19 | 0 |
| Agree or Disagree?? | 04/11/25 | Researcher | 20 | 2 |
| Re: Agree or Disagree?? | 04/11/26 | Sunflower 5 | 14 | 0 |
| Re: Agree or Disagree?? | 04/11/28 | Pear | 16 | 1 |
| Re: Agree or Disagree?? | 04/11/29 | Macadamia 2 | 10 | 0 |
| agree side | 04/11/24 | Rosemary | 18 | 0 |
| Taiwan Value | 04/11/28 | Peppermint | 13 | 0 |

## Appendix 13 Researcher's Posting Numbers and Questions

This appendix lists the number of researcher's postings, researcher's questions within each discussion and the number of students' postings:

Number of Researcher's Postings and Questions

| Topics | Postings | Questions | Students' postings |
|---|---|---|---|
| Betelnut Beauties | 5 | 4 | 19 |
| Taiwan value | 7 | 3 | 27 |
| Foreign Minister's LP | 4 | 2 | 17 |
| Madame Chiang K.S. | 3 | 2 | 14 |
| Weapon purchase | 10 | 7 | 44 |
| First Lady of Taiwan | 11 | 5 | 53 |
| Lee Teng-hui in Japan | 3 | 2 | 9 |
| Researcher's total | 43 | 25 | 183 |

## Appendix 14 Most Active Online Participants' Participation Records

The following is a table of the twelve most active online participants by week 16

Most Active 12 Online Participants' Participation Records

| Students | Logins | Browsing | Asynchronous | Synchronous |
|---|---|---|---|---|
| Rose | 177 | 96 | 21 | 0 |
| Sunflower | 93 | 85 | 20 | 5 |
| Daffodil | 135 | 79 | 14 | 2 |
| Tulip | 32 | 15 | 8 | 3 |
| Margarita | 89 | 35 | 7 | 4 |
| Lavender | 45 | 17 | 6 | 2 |
| Macadamia | 37 | 17 | 5 | 4 |
| Cinnamon | 23 | 14 | 4 | 0 |
| *Lily | 36 | 36 | 4 | 1 |
| Eucalyptus | 41 | 21 | 4 | 0 |
| *Dandelion | 31 | 29 | 4 | 0 |
| Peppermint | 10 | 5 | 4 | 0 |

* marks students from the non-research class who participated online after week 11

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