ABSTRACT

This study investigated students' use of cohesive devices in online learning environment, i.e. threaded discussion and how it reflects the critical thinking. The study aims to: 1) determine the frequency of each type of cohesive devices, i.e. reference, substitution, ellipsis and conjunctions used by participants in threaded discussion, 2) determine the students' critical thinking abilities by using the content analysis tool established by Newman et .at in 1995, and to 3) delve into the relationship, if any, the use of the cohesive devices in reflecting the critical thinking performance of participants. The lack of the studies which focused on the language use and how it might reflect the critical thinking of its user motivated the researcher to undertake this study.

Participants of the threaded discussion were the postgraduate students of the Faculty of Languages and Linguistics of a public university located in Klang Valley. A mixed method data analysis method was adopted for this study. Data was collected from the postgraduate courses' threaded discussion assignment mediated via a learning management system named Moodles. Overall, four threaded discussion transcripts were collected and used as the source of data of this study. Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion and the Newman et. al (1995) content analysis scheme were adopted to analyse the data and these two models provided quantitative results. In order to investigate the link between the use of cohesive devices and critical thinking performance, an inductive qualitative data analysis approach was used to study the context where the pronoun 'I', substitution, ellipsis and conjunction appeared and how the use of them might reflect the critical thinking performance of the participants.

Based on the Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion, it was found that *reference* is the most frequently used cohesive device, followed by the

conjunction, *substitution* and *ellipsis*. In addition, after coding the data using The Newman et. al (1995) content analysis scheme, it was found that the participants' postings mainly reflected their critical thinking ability in terms of being able to include relevant(R+ positive critical thinking indicator), clear (AC+ positive critical thinking indicator), novel (N+ positive critical thinking indicator) and justified (JS+ positive critical thinking indicator) input into the threaded discussion. It was found that in the postings, the participants integrated a lot of their personal experience into the discussion and were able to link their ideas coherently. However, it was found that the participants generally lacked the ability to critically evaluate their peers' or their own postings. Simultaneously , the findings revealed that in terms of the use of reference, personal pronoun 'I' scored the highest frequency of use and it was more for conveying a personal, substantiated agreement, disagreement or viewpoint, and they would be likely to be awarded positive critical thinking indicators such as R+, AC+, C+, and N+ indicators. While in instances where pronoun 'I' had been used to convey a personal but unsubstantiated agreement, disagreement or viewpoint, they would be likely to be awarded negative critical thinking indicators such as I-, L-, C-, N- and W- indicators.

As far as the use of substitution and ellipsis is concerned, it seems that the correct use of these two cohesive devices helped make the instances clear and relevant to the overall context of discussion. However, the assignment of other codes or indicators, other than clear (AC+) and relevant (R+) indicators, seems not to be influenced by the correct use of substitution and ellipsis, rather it relied on the content tried to be conveyed by the instances where substitution and ellipsis had been found.

With regard to how the use of the conjunction could reflect critical thinking, the use of the adversative conjunction 'but' and 'however' appeared were found to be more frequently assigned with the positive critical thinking indicator C+ (Critical assessment of others' or own contributions) as compared to instances of the other conjunctions. The

positive critical thinking indicator JS+ (Justification) was assigned most frequently to the instances where the causal conjunction 'because' was found. Apart from the positive critical thinking indicators C+ and JS+, it seems that the assignment of the rest of the positive critical thinking indicators and negative critical thinking indicators was not influenced by the use of different conjunction. Instead, the assignment of the other positive and negative critical thinking indicators was dependent on content of the sentences where conjunction items were found.

ABSTRAK

Kajian ini menerokai bagaimana penggunaan alat kohesif Inggeris oleh pelajar siswazah semasa perbincangan Thread dapat mencerminkan pemikiran kritis mereka. Matlamat kajian ini adalah untuk: 1) menentukan kekerapan keempat-empat alat kohesif iaitu rujukan, kata hubung, penggantian dan elipsis yang digunakan oleh pelajar siswazah dalam perbincangan Thread, 2) menentukan kebolehan pemikiran kritis pelajar dengan menggunakan cara analisa data yang dicipta oleh Newman et. al pada tahun 1995, dan 3) untuk menyelidiki hubungan , jika ada , penggunaan keempat-empat alat kohesif khususnya dalam mencerminkan prestasi pemikiran kritis pelajar siswazah. Kekurangan kajian yang memberi tumpuan kepada penggunaan bahasa dan bagaimana ia mungkin mencerminkan pemikiran kritis pengguna telah menggalakkan penyelidik untuk menjalankan kajian ini.

Peserta-peserta kajian terdiri daripada pelajar –pelajar siswazah yang belajar di Fakulti Bahasa dan Linguistik sebuah universiti awam yang terletak di Lembah Klang. Kaedah data analisis campuran telah digunakan untuk kajian ini.Data dikumpul daripada perbincangan Thread yang merupakan salah satu tugasan bagi pelajar-pelajat siswazah. Tugasan ini dilancarkan dengan menggunakan sistem pengurusan pembelajaran yang dinamakan Moodles .Secara keseluruhannya, empat transkrip perbincangan Thread telah dikumpulkan dan digunakan sebagai data untuk kajian ini. Halliday dan Hasan (1976) teori kohesif dan Newman et. al (1995) kaedah analisis telah digunakan untuk menganalisis data dan ini menghasilkan keputusan kuantitatif. Sebaliknya , pendekatan induktif telah digunakan untuk mengkaji konteks di mana alat-alat kohesif itu muncul dan mengkaji bagaimana penggunaan alat-alat kohesif dalam konteks berikut dapat mencerminkan prestasi pemikiran kritis peserta-perserta kajian ini.

Berdasarkan Halliday dan Hasan (1976) teori kohesif, didapati bahawa rujukan ialah alat kohesif yang paling kerap digunakan , diikuti oleh kata hubung , penggantian dan elipsis . Di samping itu, selepas menggunakan Newman et. al (1995) kaedah analisis untuk menganalisa data, ia didapati bahawa produk peserta mencerminkan kemampuan berfikiran secara kritis mereka dari segi mereka mampu menyumbang maklumat yang berkaitan (R + penunjuk pemikiran kritikal positif) , jelas (AC + penunjuk pemikiran kritikal positif) , asli dan baru (N + penunjuk pemikiran kritikal positif) dan wajar (JS + penunjuk pemikiran kritikal positif) ke dalam perbincangan Thread. Meraka juga banyak memasukkan pengalaman peribadi mereka ke dalam perbincangan dan mereka mampu untuk menghubungkan idea-idea mereka secara logik . Walau bagaimanapun, ia didapati bahawa para peserta umumnya kurang keupayaan untuk menilai secara kritikal maklum balas rakan-rakan mereka dan juga maklumat yang disumbangkan oleh mereka sendiri. Dalam masa yang sama, hasil kajian juga menunjukkan untuk alat kohesif rujukan, penggunaan kata ganti nama diri orang pertama tunggal 'saya' mencatat frekuensi penggunaan tertinggi. Ayat-ayat di mana kata ganti diri pertama tunggal 'saya' muncul bertujuan untuk menyatakan persetujuan, tidak bersetuju atau pendapat yang disokong oleh sebab-sebab atau bukti bukti, maka ayat-ayat seperti ini kemungkinan besar akan dianugerahkan petunjuk-petunjuk positif pemikiran kritis seperti R+ (maklumat yang berkaitan), AC+(jelas), C+(menilai secara kritis sumbangan orang lain atau sumbangan sendiri) and N+ (asli dan baru). Tetapi, kalau kata ganti nama diri orag pertama tunggal 'saya' digunakan untuk menyatakan persetujuan, tidak bersetuju atau pendapat yang tidak disokong oleh sebab-sebab atau bukti bukti, maka kemungkinan besar ayat-ayat ini akan dianugerahkan petunjuk-petunjuk negatif pemikiran kritis seperti I- (maklumat yang kurang penting), C-(tidak menilai secara kritis sebelum menerima atau menolak pendapat orang lain) and L- (mengulangi maklumat yang sedia ada tanpa memberi inferensi atau interpretasi yang baru, atau

pelajar cuma menyatakan bahawa dia bersetuju dengan pendapat orang lain tanpa menambah pendapat sendiri) dan W- (mengehadkan perbincangan).

Berkenaan dengan penggunaan penggantian dan ellipsis, penggunaan penggantian dan ellipsis dengan betul membantu dalam menghasilkan ayat yang jelas (AC+) dan berkaitan (R+) dengan kontek perbincangan keseluruhan. Tetapi, pemberian petunjuk-petujuk yang lain tidak dipengaruhi oleh penggunaan penggantian dan ellipsis dengan \betul sahaja. Pemberian petunjuk-petunjuk yang lain bergantung kepada isi kandungan yang hendak disampaikan oleh ayat-ayat di mana penggantian dan ellipsis ditemui.

Dengan mengambil kira bagaimana penggunaan kata hubung dapat mencerminkan pemikiran kritis para peserta, contoh di mana kata hubung tentangan Inggeris 'but' dan ' however ' muncul telah didapati lebih kerap diberikan petunjuk positif pemikiran kritis C + (menilai secara kritis sumbangan orang lain atau sumbangan sendiri) berbanding dengan contoh-contoh di mana kata hubung yang lain muncul. Petunjuk positif pemikiran kritis JS + (Justifikasi) paling kerap diberikan kepada contoh-contoh di mana kata hubung sebab-musabab Inggeris 'because' dijumpai. Selain petunjuk positif pemikiran kritis C + dan JS+, pemberian petunjuk positif pemikiran kritis dan petunjuk negatif pemikiran kritis yang lain tidak dipengaruhi oleh penggunaan kata-kata hubung. Sebaliknya, pemberian petunjuk positif dan negatif pemikiran kritis bergantung kepada isi kandungan yang hendak disampaikan oleh ayat-ayat di mana kata hubung ditemui.

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest gratitude to my advisor Dr Ng Lee Luan for her continuous spiritual support and excellent guidance throughout my master study and research. Her guidance helped me in all the time of research and writing of this dissertation. I could not have imagined having a better advisor and mentor for my master study.

My sincere thanks also goes to the two friends of mine, namely Miss Joanne Yeoh and Mr Choh Leang Chung who helped me search for many pieces of research articles. All these pieces of the research articles that they had helped me to look for were one of the key factors that enabled me to finish my dissertation writing successfully. Many thanks to Mr Ong Guang Han who has always been supportive and has never failed to share with me his research experience. He has also offered me great helps throughout the research period. I would like to thank my coursemate, Mr Francis Wong for offering all sorts of helps throughout my master study.

Last but not the least, I would like to thank my family members namely my late father, Mr Tan Yong Chai and my mother, Miss Lim Moo Tan, my late uncle, my aunts, my sister, my grandmother and my cousins for their continuous financial and spiritual supports. Without the supports, guidance and helps from the every person I mentioned above, this dissertation would not have been possible.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION

1.1 Overview

Critical thinking has increasingly been seen as one of the important attributes when empowering human capital is concerned. For instance, as stated in 10th Malaysian Plan, "the success of the innovation agenda hinges on a Malaysian citizenry that values openness, embraces **critical thinking** and encourages risk taking and experimentation. This will require an education system that nurtures creative and analytical human capital" (PostGraduan, 2009). Besides that, as quoted by Koo, Wong, Kemboja, Chang and Mohd Subakir (2011) in their study, Malaysia Ministry of Higher Education has established the National Higher Educational Plan 2007-2010 which "aims squarely on holistic human capital development, to produce Malaysians who are intellectually active, creative, innovative, adaptable and capable of **critical thinking**" in order to address the unemployment situation among public universities graduates. All these suggest that higher educational institutions should be able to produce university leavers who possess the capability to think critically in order to help them to secure employment. Owing to the importance of cultivating critical thinking in higher educational scene, it is therefore necessary for the instructors to understand how to carry out learning activities incorporating critical thinking. Thus, this study will look into assessing the critical thinking performance of the participants who are postgraduate students in the context of threaded discussion. In addition, in order to find out whether the use of cohesive devices reflects the critical thinking skills of the participants, this study will further investigate the use of cohesive devices in threaded discussions.

1.2 Background to the Problem

Though much research has shed lights on critical thinking abilities or disposition (Fahim, Bagherkazemi, & Alemi, 2010; Kamali & Fahim, 2011; Ricketts & Rudd, 2004; Wangensteen, 2010), little research has been done so far in examining the possible relationship exists between students' critical thinking traits and their learning performance in computer-mediated communication environment. Professor Dr Chuah Hein Tiek, the president and CEO of the University of Tunku Abdul Rahman, pointed out that Malaysia workforce is competent enough when technical wise is concerned. However, they are deprived of the ability to think critically which causes them to lose out in this competitive er*a* (PostGraduan, 2009). In addition, Malaysian graduates who went through Malaysian education system were claimed by human resources and recruitment consultants as being poor in both critical thinking skills and communication skills (Bernama, 2012). This phenomenon further indicates that critical thinking skill is essential for students of higher education to possess in order to become well rounded workers and be able to survive and compete in the competitive job market. In fact, some of the higher educational institutions have emphasised on the teaching and learning of CT skills by introducing courses to teach students on how to think critically and they have also introduced critical thinking test. Cambridge University, for instance, has introduced Cambridge Thinking Skills Assessment to assess the students' critical thinking and problem solving skills since the year 2001. Furthermore, instead of setting up a whole course solely dealing with critical thinking, some universities have decided to integrate element of critical thinking into programmes offered; for example, one of the objectives of the English Language Proficiency Programme created by University of Malaya is to enhance the critical thinking level of the students. Thus, it would seem imperative for the higher education curriculum to be designed and implemented in line

with the goal of cultivating students with critical thinking skills. In the following section, significance of the study will be presented.

1.3 Significance of the study

E- learning has gained popularity in the Malaysian higher educational context. Many public and private universities in Malaysia have implemented E –learning due to their belief in the benefits of e-learning in both knowledge construction and transmission processes (Hussain, 2004). One of the advantages of practising E-learning is it enables the instructors to carry out Computer Supported Collaborative Learning (CSCL) activities with their students. The idea of engaging students in various CSCL activities in educational context is embraced by many because many believed that participating in CSCL activities could be helpful in terms of improving the students' critical thinking skills. Thus, in accordance to the phenomena of E-learning proliferating the tertiary educational setting, this study will provide insights regarding how E-learning technologies such as threaded discussion can be used as a teaching –learning platform in inculcating and enhancing critical thinking skills among students. E-learning technologies such as asynchronous threaded discussion are said to have potential in developing critical thinking skills among learners (Leston-Bandeira, 2009). There is lack of studies which explores the relationship between the threaded discussion and critical thinking. However, a number of studies have investigated the use of linguistic elements such as cohesive devices and how it influences the writing quality of the students. The examples of the frameworks which had been employed by the previous researchers who studied the cohesive devices found in the writing samples were Halliday and Hasan Taxonomy of Grammatical Cohesion (1976) and Celce –Murcia Conjunctive Adverbials framework (1999). In addition, several studies also reported that the asynchronous threaded discussion resembled the written discourse where

syntactically complex sentences were found (Baron 2010, Lapadat, 2002). In view of what was stated by Leston-Bandeira (2009), which indicated that there is potential in developing critical thinking skills among learners via threaded discussions, it would be logical to assume the trend of participants in using certain cohesive devices is likely to influence the quality of postings and the trend of participants in using certain cohesive devices is also likely to enable researchers to gain some perspectives on the participants' critical thinking performance. Besides that, content analysis carried out in this study will reveal the strengths and the weaknesses of students when engaging in the tasks, which involve the use of critical thinking skills. This could later become a guide for educators to recognise and improve on the students' weaknesses and to enhance the students' strengths in order to boost their critical thinking performance. The empirical data gained will then contribute to the design of instructional strategies which aim to teach and tackle the problems that students face in conveying critical thinking. It will also help to tackle the problems students may face with the use of cohesive devices to link their ideas. In addition, although there are numerous studies which investigated the linguistic features found in computer mediated communication transcripts, there has been no direct study which investigates how the use of certain linguistic features reflects the critical thinking performance. Thus, this research aims to fill this gap by investigating how the use of cohesive devices could reflect the critical thinking performance of participants in online discussion. Supported by the recent Malaysia soft skill scale's (My3S) findings which reflected the fact that critical thinking is one of the weak areas for university students in Malaysia, the outcome of this study could be used as a guide, in the matter of establishing threaded discussion as part of e-learning, to inculcate and enhance critical thinking among students in tertiary education institutions.

1.4 Objectives

The overall purpose of this study is to examine how students' use of cohesive devices in online learning environment, i.e. threaded discussion reflects their critical thinking. There are three specific objectives of this study. Firstly, the research is aimed to determine the choice and frequency of types of cohesive devices, i.e. reference, substitution, ellipsis, conjunctions used by participants in threaded discussions. Secondly, this research hopes to determine the students' critical thinking abilities by using the content analysis scheme established by Newman, Webb and Cochrane in 1995.Newman et.al (1995) regarded critical thinking as cognitive behaviours displayed by learners when they participate in problem solving activities. The critical thinking behaviours can be quantified via the means afforded by the Newman et. al.(1995) content analysis approach. Thirdly, this research will delve into the relationship, if any, of the use of cohesive devices in reflecting the critical thinking performance of participants. This study will employ the Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion to analyse cohesive devices found in the data. In relation to the stated objectives, the following are the research questions.

1.5 Research Questions

- What is the frequency of each of the cohesive devices used by the participants in the threaded discussions?

- What is the critical thinking performance attained by each threaded discussion?

- How does the use of cohesive devices reflect the participants' critical thinking?

1.6 Scope and Limitations

The limitation of this study is the selection of the respondents was confined to the postgraduate students enrolled in two specific postgraduate courses, namely the Research Methodology course and Second Language Acquisition course. Thus, the findings cannot be generalised to a larger population. The small population of respondents, together with the limited duration given to the respondents to engage in threaded discussion contributed to the limitations in the research.

Additional to that, for the purpose of this study, Newman et.al (1995) content analysis framework was the only tool used by the researcher to measure the presence of critical thinking in the data. In other words, the researcher took into account only the positive and negative critical thinking indicators identified by Newman, Webb and Cochrane (1995) when she analysed the data. The other types of critical and uncritical thinking characteristics proposed by other researchers would not be taken into consideration in this study. Hence, the findings and discussion of this study were restrained due to the limited types and number of positive and negative critical thinking characteristics presented in Newman, Webb and Cochrane (1995) content analysis scheme.

Furthermore, based on Halliday and Hasan (1976) taxonomy of grammatical cohesion, the researcher of this study focused on grammatical cohesion which comprises four types of cohesive devices which are known as the reference, substitution, ellipsis and conjunction and how the use of these four types of cohesive devices may reflect the critical and uncritical thinking characteristics identified by Newman et.al content analysis framework (1995). This means that the researcher again had to disregard the other type of cohesive devices introduced by other researchers except the four grammatical cohesive devices proposed by Halliday and Hasan (1976).

In addition, the use of linguistic elements except the cohesive devices and the other factors such as coherence of the postings, learning strategies and cognitive development

of the participants would not be taken into account in regards to how these factors may affect critical thinking performance. In short, the selection of the frameworks used for this study therefore contributed to the limitations in the research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents the relevant literature review associated with the present study. As mentioned in Chapter 1, the overall purpose of this study is to examine how the students' use of cohesive devices in online learning environment, i.e. threaded discussion reflects critical thinking. In line with the overall purpose of this study, this chapter first outlines the general concept of critical thinking. Then, in congruent with the specific objective of the study which is to assess the critical thinking found in the asynchronous online discussion transcripts, reviews of literature related to assessing critical thinking found in asynchronous online discussion are also included. Lastly, reviews related to the studies related to the concept of cohesion are outlined.

2.2 Definitions of critical thinking

To date, many scholars from various fields have made their contributions in attempting to define or conceptualize critical thinking, causing it to become an ubiquitous term in academic literature world (Cosgrove, 2011; Minter, 2010; Petress, 2004)**.** The origin of most of the definitions of the term critical thinking can be traced from at least three fields of study namely philosophical, cognitive psychological and educational (Lai, 2011). Therefore, definitions of critical thinking could be said to be field-dependent.

For instance, John Dewey (1933), who is famous for his progressive education movement which stresses on the use of real life experience and tasks, reflective thinking, and active learning and who has been bestowed the title of the "father" of the modern critical thinking tradition, viewed critical thinking as a kind of reflective thinking. He further defined the term critical thinking as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (Dewey, 1933). The effort of defining

critical thinking has continued after John Dewey. This has been proven when numerous scholars from different period of time have come out with modified, novel definitions for the term critical thinking. For instance, Facione (1990), Halpern (1998), Stall and Stahl (1991), Ennis (1985) and Garrison (2000) are the few who have defined the term critical thinking. Among the substantial amount of critical thinking definitions, the definition of critical thinking found in Delphi Report (Facione, 1990) is deemed more influential than the others. This is because the definition critical thinking in Delphi Report (Facione, 1990) is the outcome of the first consensus made towards defining critical thinking. In the next section, details regarding Delphi Report (Facione, 1990) will be provided.

2.2.1 Delphi Report

Facione together with a group of leading figures from various academic fields had been collaboratively working on defining the term critical thinking in order to work towards achieving a consensus regarding what critical thinking is and providing insights regarding other issues of concerned related to critical thinking. The outcome of their effort was the Delphi report (Facione, 1990). The Delphi report provides the definition of critical thinking. Below is the full definition of critical thinking extracted from the Delphi Report (Facione, 1990).

> "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal

critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society."

(Delphi Report, Facione, 1990)

In Delphi report (Facione, 1990), critical thinking is said to consist of two domains which are known as the domain of skills and the domain of affective dispositions. The domain of skills includes the cognitive skills and sub skills involved in critical thinking while the affective domain suggests some of the characteristics or attitudes one should possess and embrace in order to be a good critical thinker. Both domains are deemed as important to ensure the success in producing ideal critical thinkers. Delphi Report (Facione, 1990) also implies that educators should address both domains together when they try to inculcate critical thinking skills among the students. Besides providing the definition, Delphi Report (Facione, 1990) also includes some recommendations regarding the ways that can be used to integrate critical thinking into the learning curriculum and also the ways to assess critical thinking skills. Thus, Delphi report could be seen as a useful guideline for educators and education policymakers who plan to encapsulate critical thinking elements in the curriculum. Besides the definition of critical thinking provided in Delphi Report (Facione, 1990), there are other scholars who have also come up with their definitions of critical thinking. In the following section, some other definitions of critical thinking will be presented.

2.2.2 Other Definitions of Critical Thinking

Halpern (1999) claimed that critical thinking is the use of those cognitive skills or strategies that increase the probability of a positive outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed. It is the kind of thinking involved in solving problems, formulating inferences, calculating likelihood, and making decisions. According to her, critical thinkers are those who incline to think critically and are able to exercise the skills aptly (D.F. Halpern, 1999). Halpern (1999) also mentioned that critical thinking can be taught as argument analysis through the use of reasoning skills.

Another well accepted definition came from Robert H. Ennis. Ennis (1985) defined critical thinking as "reasonable, reflective thinking that is focused on deciding what to believe or do" (p. 28) while Stall and Stahl (1991) defined critical thinking as a development of "cohesive, logical reasoning patterns and understanding assumptions and biases underlying particular positions" (p. 82). Meanwhile, Gieve (1998)claimed that in order for students to engage themselves in thinking critically, they should be able to "examine the reasons for their actions, their beliefs, and their knowledge claims, requiring them to defend themselves and question themselves, their peers, their teachers, experts, and authoritative texts" (p. 126). Despite the differences in ideas lies within the three proposed definitions, the three definitions highlighted the same issue that is central to critical thinking, which is that individuals need to be able to recognize, understand and evaluate others' and their own beliefs. Their judgments have to be supported by good reasons. In order to do so, individuals need to be open-minded and fair –minded as stated in Delphi report (Facione, 1990).

As cited by Jun (2011), Benjamin Bloom (1956) described critical thinking as the capability to learn and obtain new knowledge through the exploration of ideas based on

the following six levels of thinking which are known as knowledge, comprehension, application, analysis, synthesis, and evaluation. Benjamin Bloom and his colleagues (1956) created Bloom Taxonomy that consists of three domains namely the cognitive domains, affective domain and psychomotor domain. Under cognitive domain, thinking has been categorised into six levels of complexity. When students move further up the taxonomy, they are more likely to exercise their critical thinking skills as they engage in more sophisticated and complex learning tasks that demand them to employ higher order thinking skills such as analysis, synthesis and evaluation in order to tackle the tasks successfully.

In addition, critical thinking skills also have been assumed to be equivalent to problem solving skills (Ennis, 1985; Garrison, et al., 2000; D. F. Halpern, 1998; Willingham, 2007) although there are scholars like Dr. Lowell Hedges who disagreed with the notion that critical thinking is similar to problem solving skills. He claimed that critical thinking skills are not the same as problem solving skills. The reason being problem solving is a linear process of evaluation on its own. Critical thinking, on the other hand, is a comprehensive set of abilities which guide the inquirer to facilitate each phase of the linear problem-solving process properly (Hedges, 1991). In other words, although Hedges (1991) claimed that problem solving is not the same as critical thinking, critical thinking is deemed crucial to problem solving. This is because critical thinking skills could assist individuals during problem solving process. The above are some of the definitions and views related to the term critical thinking.

Newman, Webb and Cochrane (1995) divided critical thinking into two types, namely the positive critical thinking and negative critical thinking. Newman, Webb and Cochrane (1995) regarded critical thinking as cognitive behaviours displayed by learners instead of treating it as stages that were experienced by the learners. They created a content analysis scheme which could be used to assess the critical thinking

performance in online learning. In their content analysis scheme, there are positive critical thinking indicators and negative critical thinking indicators. They derived their positive and negative critical thinking indicators based on Garrison (1992) five-stage of problem solving and Henri's (1992) cognitive dimension indicators. Garrison proposed a five-stage problem solving process which he believed could give rise to critical thinking. Henri's (1992) cognitive dimension indicators are used to determine the presence of critical thinking in online learning. Newman, Webb and Cochrane (1995) content analysis scheme was used by the researcher to assess the critical thinking found in the data of this study.

Critical thinking has also gained its popularity in the field of education. This phenomenon can be seen from the considerable amount of studies which relate critical thinking to education (Ennis, 1993; Facione, 1990; McKinley, 2010; Shirkhani & Fahim, 2011). For instance, fuelled by the growing interest of infusing critical thinking elements in America K-12 curriculum, Facione and a group of experts carried out a research and produced the Delphi Report (Facione, 1990). The research concerned primarily on stating the possible elements that constitute critical thinking and also providing suggestions regarding critical thinking assessment. It is evident that inculcating critical thinking skills among the students has become the major concern of the educational world. Thus, in the next section, the studies related to the teaching of critical thinking will be reviewed.

2.3 Teaching of Critical Thinking

In this section, teaching of critical thinking will be looked into from two aspects: 1) teaching and learning methodology used to enhance critical thinking which covers the role of students and teachers in class and also 2) the type of activities and tasks designed that can be used to promote critical thinking.

2.3.1 Teaching and Learning Methodology and Critical Thinking

Teaching practice that favours rote learning , spoon feeding and teacher- centeredness are deemed no longer suitable to be practised by teachers in large scale as they hardly help in promoting critical thinking among the students. In order to train students to become critical thinkers, student-centeredness is the main key. In other words, teacher's role as an authoritative figure in classroom needs to be altered. Their new role is to be a facilitator who scaffolds the teaching and learning process, guides the students towards creating new knowledge and solving problems, discusses in depth on issues by providing insightful comments, ideas and feedback to the students (Hung, Tan, & Koh, 2006; Wohlfarth et al., 2008). For instance, where second language teaching and learning is concerned, teaching methodologies such as audiolingual method and grammar translation method are considered inappropriate and outdated. They are not effective in fostering thinking culture among the students because they emphazised on teacher-centeredness. In contrast, teaching methodologies such as problem-based learning, cooperative learning, communicative language teaching and inquiry based learning that emphazise on student-centeredness are encouraged to be practised by teachers. Student centeredness teaching is said to be able to encourage critical thinking among the students (Hung, 2006). These methodologies regard students as active learners in the teaching and learning process instead of just being passive knowledge retriever throughout lessons in classroom. In addition, in order to promote critical thinking culture in the classrooms, educators are also urged to design learning tasks and activities that require students to exercise thinking skills such as analysing, synthesizing and evaluating.

These three thinking skills are known as the higher order thinking skills according to Bloom Taxonomy (1956). Furthermore, constructivism school of thought which advocates cooperative and collaborative learning further propels the reform of

educational system (Lai, 2011). This is because constructivism also stresses on the importance to recognise the entity of students as potential knowledge generators themselves. Lai (2011) asserted that students are able to construct their own knowledge based on their own previous life experience and also through their interaction with others. Thus, students should be treated as active actors in teaching and learning process. Several studies also have shown that the application of constructivism teaching pedagogy can promote critical thinking development among students (Afolabi &Akinbobola, 2009; Leston-Bandeira, 2009; K. M. Li, 2010). Researchers like Leston-Bandeira (2009) conducted case studies to investigate the effectiveness of two e-learning modules in developing critical thinking among students. She found that e-learning modules which encouraged the use of active learning and constructivist approach can help foster critical thinking among students. Based on their research findings, Akinbobora and Afolabi (2009) suggested that constructivist practices, through guided discovery approach, can engage students in critical thinking process. In addition, Li (2010) investigated the possible link between the use of social-constructivist pedagogical model and the improved critical thinking. He stated that the integration of social constructivist pedagogical model could enhance students' critical thinking skills.

In addition, there were also a number of studies which support the claim that cooperative learning and collaborative learning modes used in classroom, can help to promote critical thinking among the students (Goyak, 2009; Maesin, Mansor, Shafie, & Nayan, 2009).For instance, proponents of collaborative learning claimed that collaborative learning not only increases the interests to learn among the students, but it also encourages them to think critically. Study by Gokhale (1995) showed that collaborative learning has positive effect on promoting critical thinking and facilitating problem solving among the participants and collaborative learning is especially helpful

when the instructor's aim is to stimulate critical thinking among students. Besides that, one of the benefits of cooperative learning recognised by Panitz & Panitz (1998) is improved critical thinking. Panitz (1999) believed that in a typical college classroom which emphasizes on lecturing, there is little time for reflection and discussion of students' errors or misconceptions. However, with the practice of cooperative learning paradigm, students are continuously engaging themselves in discussion and debate. Through engaging the students in higher level discussion within group, their critical thinking skills can be harnessed. Study conducted by Barzdziukiene et.al. (2006) also showed a relationship is established between critical thinking and cooperative learning and they stated that students who can master critical thinking are also those who can master cooperative learning skills. They further proposed the strategies on how to carry out cooperative learning effectively so that it can become a suitable alternative used to nurture critical thinking.

Apart from collaborative and cooperative learning modes, questioning has been acknowledged as one of the practices that should be encouraged in the classroom. This is because many believe that questioning is an activity that helps in stimulating and fostering critical thinking (M. E. Alexander, Commander, Greenberg, & Ward, 2010; Walker, 2005).One of the techniques of questioning is known as Socratic questioning. Thus, Socratic Questioning is recommended to be used by educators with their students in order to enhance critical thinking (MacKnight, 2000; Paul & Elder, 2006; Yang, Newby, & Bill, 2005). For instance, Yang (2005) and Macknight (2000) pointed out the importance of using Socratic questioning technique by participants of asynchronous online discussions, as it will help to develop their critical thinking skills. Paul and Elder (2006) mentioned in their book that deep questioning is the cornerstone of critical thinking and they have come out with examples on how to practise Socratic questioning. Thus, Socratic questioning could be the approach adopted by educators to teach the

students the right and effective way to construct and ask thought- provoking questions that involve the use of higher level thinking skills. The questions constructed using Socratic questioning techniques require the respondents to exercise their critical thinking skills in order to answer them. Thus, it is said that during this questioning and answering period, critical thinking skills of both parties i.e. questioners and respondents can be improved further. Apart from the abovementioned teaching methodologies and questioning technique which could contribute to promoting critical thinking among the learners, writing activity could also trigger students to think critically. Studies that looked into writing activity and critical thinking would be reviewed in the following section.

2.3.2 Writing Activity and Critical Thinking

Other activities such as writing are said to be able to develop critical thinking skills. According to Gocsik (2002), writing needs students to make important critical choices and ask critical questions themselves, both tasks require critical thinking to complete. Burton (2003) also indicated that writing can be an effective way to teach critical thinking.

Burton (2003) also claimed that being able to construct, identify and evaluate arguments is one of the skills that students need to acquire in order to become critical thinkers. In terms of writing tasks, argumentative writing is perceived by many scholars as an activity that can foster critical thinking among the learners (Flores, 2006; Hillocks Jr, 2010; Lai, 2011; Rex, Thomas, & Engel, 2010)For instance, Lai (2011) stated that the tasks that are deemed appropriate to assess critical thinking are those tasks which are in open- ended format, using authentic real life issues as the catalyst of problem solving activities and also those that require students to create logical arguments. Rex, Thomas & Engel (2010) and Hillocks Jr (2010) stressed the importance of creating critical

thinkers through the teaching of constructing reasoned and logical arguments. This is because being able to argue is considered as part of critical thinking skills.

After reviewing the literature pertaining to the teaching of critical thinking which focused on aspects such as the reforming of educational policy, altering of teaching and learning methodologies from teacher-centered mode to student-centered mode, cultivating questioning culture in classrooms and using activities such as writing to foster critical thinking among students, the issue of how to assess critical thinking effectively is also a matter of great concern to the educators. This is because assessment is one of the ways that can provide feedback to educators on the effectiveness of their teaching concerning critical thinking. Therefore, in the following section, studies that looked into the issue of assessing critical thinking will be reviewed.

2.4 Assessment and Measurement of Critical Thinking Skills

Apart from the growing interest in the field of teaching critical thinking, assessing critical thinking skills has also become a matter of great concern among educational policymakers and also those who are likely to be affected by the educational policy such as the educators, students and their potential future employers. Many higher educational institutions worldwide integrate the teaching and testing of critical thinking skills in their curriculum. For instance, Cambridge University has conducted Thinking Skills Assessment (TSA) which contains critical thinking questions. TSA is administered as part of its admission process. In the section below, the tests and rubrics that have been used to measure critical thinking performance were presented.

2.4.1 Tests and Rubrics Used to Assess Critical Thinking Performance

Due to the demand for testing critical thinking, many researchers have studied and designed instruments which are used for assessing and measuring critical thinking skills.

Critical thinking tests generally take the form of multiple choice questions, open-ended questions such as essay writing and also performance based tasks (Ennis, 1993). However, there are problems that lie within the design of critical thinking tests especially when the validity and reliability of each test is concerned. Thus, until now, there are still a lack of ideal critical thinking tests which can effectively assess the strengths and weaknesses of critical thinking ability of the test-takers. Examples of critical thinking tests are the California Critical Thinking Skills Test, Cornell Critical Thinking Test, The Ennis-Weir Critical Thinking Essay Test, Watson –Glaser Critical Thinking Appraisal. Besides various types of tests, rubrics used to assess critical thinking are also available; for example, the Holistic Critical Thinking Rubric, WSU Critical Thinking Rubric and University Studies Critical Thinking Rubric. In the next section, frameworks used to assess critical thinking performance in threaded discussion were outlined.

2.4.2 Frameworks Used to Assess Critical Thinking Performance in Threaded Discussion

Since assessing participants' critical thinking group performance in threaded discussion or asynchronous online discussion is one of the research objectives of this research, the frameworks which are used to assess critical thinking skills and performance found in the transcripts of online discussion will be discussed. There are several frameworks available to assess critical thinking performance of participants in online discussion. The frameworks are shown in Table 2.1 below:

Authors	Norris & Ennis (1989)	Henri (1992)	Garrison, Anderson & Archer (2001)	Newman, Webb & Cochrane (1995)	Bullen (1997)
Step 1	elementary clarification	elementary clarification	triggering events	clarification	clarification
Step 2	basic support	in-depth clarification	exploration	in-depth clarification	assessing evidence

Step 3	inference	inference	integration	inference	making and judging inferences
Step 4	advanced clarification	judgement	resolution	judgement	using appropriate strategies and tactics
Step 5	strategies and tactics	strategies	—	strategy formation	—

Table 2.1 Summary of Critical Thinking Models Adopted from Murphy (2004)

Sections 2.0 to 2.4.2 above delineate the dimensions that are related to the studies of critical thinking ranging from its definitions to its manifestation in educational arena. In the following section, studies regarding computer mediated communication and its use to promote critical thinking in online learning environment will be reviewed. Particular attention will be paid to asynchronous online discussion which is one type of computer mediated communication technology. This is because the asynchronous online discussion transcripts were collected as data for the purpose of this study.

2.5 Computer Mediated Communication

Computer Mediated Communication or CMC has brought about rapid changes to the educational world (Sotillo, 2000). The availability and the accessibility of CMC tools has transformed the traditional ways of teaching and learning by introducing concepts such as e-learning, blended learning and also distance learning (Al-Zaidiyeen, Leong, & Fong, 2010; Nguyen, 2008; Tayebinik & Puteh, 2012). This is because CMC tools have their own, unique affordances that enable this transformation to occur (Wang & Woo, 2008). For instance, CMC tools afford teaching and learning to take place without being restrained by the time and space factors. Both learners and educators are no longer needed to be physically present if the lessons are conducted using CMC tools. CMC also allows educators and learners to experience the learning and teaching process in virtual world provided that they can access the Internet. Thus, it is said that the

integration of Computer Mediated Communication into the teaching and learning context has revolutionized the way knowledge gained and transmitted. It has also made lifelong learning possible for learners (Kaur & Sidhu, 2010; Yumuk, 2002).

In the following sections, definitions of CMC, modes of CMC and theoretical perspective (Sociocultural Theory) that supports the incorporation of CMC into teaching and learning context will be outlined. In addition, studies related to threaded discussion and critical thinking will be reviewed. The information and studies pertinent to the two related theoretical frameworks which are known as Community of Inquiry (CoI) and Practical inquiry model will also be included. CoI framework is concerned with how educational experience is shaped. Practical Inquiry model, on the other hand, illustrates the critical inquiry process in terms of the problem solving phases undertaken by the learners. The reason to include the literature review regarding CoI framework into the chapter is because CoI framework sheds light on e-learning which is in congruent with the interest of this study. By offering three types of presence that may become the determining factors of the success and failure of e-learning when it takes place within a community of learners who work collaboratively with one another, CoI framework could be a food for thought for instructors to ponder on before they carry out e-learning in class.

Practical Inquiry model represents the attempt to operationalize cognitive presence mentioned in CoI framework so that it can be measured. Cognitive presence is operationalised so that it can be measured in the form of critical thinking. Thus, in this sense, the emergence of Practical inquiry model also marked the establishment of another assessment tool that can be used to gauge the critical thinking found in online learning. Practical inquiry model is the continuation of CoI framework and it has been used extensively by various scholars to assess critical thinking in online learning environment such as CMC. Thus, it would be worthy to look at some of the studies

related to it in the later session since the purpose of this study is to assess critical thinking found in online learning as well. In the next section, the details of computer mediated communication (CMC) will be described.

2.5.1 Definitions ofCMC

To date, there are several definitions of CMC found in the current literature. Computer-mediated communication is defined as "communication that takes place between human beings via the instrumentality of computers" (Murray, 2000). However, Murray has restricted the definition to include only text based mode of CMC, even though aural and visual modes of CMC are also available. Computer-mediated communication is a widely accepted notion and it has been aptly used to elucidate the communication process "occurring via a computer terminal and a communication network such as the Internet" (P. Alexander, Dawson, & Ichharam, 2006). Luppicini (2007) defined CMC as "communications, mediated by interconnected computers, between individuals or groups separated in space and/ or time" (p.142). A more complete definition of CMC was given by Jones (1995). According to Jones (1995), CMC "of course, is not just a tool; it is at once technology, medium, and engine of social relations. It not only structures social relations, it is the space within which the relations occur and the tool that individuals use to enter that space". Thus, CMC then can be treated as a channel that enables people to socialise with one another through a virtual space. CMC allows communication to happen using various CMC tools that operate under the availability of the Internet service. CMC tools have been divided into two modes basically. In the next section, details regarding the modes of CMC tools will be included.

2.5.2 Modes of CMC

Conventionally, CMC has been divided into two basic modes of communication which are known as asynchronous CMC and synchronous CMC. Asynchronous CMC includes

threaded discussion, email and weblog. Synchronous CMC includes chat rooms, instant messenger and videoconferencing. The major difference lies between asynchronous CMC and synchronous CMC is asynchronous CMC does not need instant responses while synchronous CMC normally demands for instant responses. In other words, asynchronous CMC allows delayed response while synchronous CMC looks for immediate response. Due to this reason, compared to synchronous CMC, asynchronous CMC is said to allow learners to have ample time to ponder and reflect on their own and their peers' writings. Learners also have time to edit their own writings and refine their thoughts before putting them down in words. Sotillo (2000) also found that due to the characteristic of asynchronous CMC which allows for delayed response, the users have the tendency to produce more syntactically complex language. Below is Table 2.2 adapted from Abrams (2003). Table 2.2 illustrates the similarities and differences found between synchronous and asynchronous CMC.

Similarities of Synchronous and Asynchronous CMC	Differences between Synchronous and Asynchronous CMC	
• Extensive learner-to-learner (or learner-learner-teacher) negotiation of meaning • More "talk" time per learner than oral classroom communication • Increased amount of output results in richer and more diversed lexicon • Written code • Register between those of written and oral styles of communication.	Synchronous CMC	Asynchronous CMC
	• Relatively immediate responses • Use of outside resources cumbersome • Social immediacy of interlocutors	• Extended planning, encoding and decoding time • Use of outside resources not limited • Interactants not "immediately" present

Table 2.2: Similarities and Differences Found between the Synchronous and Asynchronous CMC (Abrams, 2003).

Based on Table 2.2 above, there are five similarities found between synchronous and asynchronous CMC as compared to typical face-to-face communication. Both

synchronous and asynchronous CMC provides greater chances for extensive learner-to-learner and learner-learner-teacher negotiation of meaning to take place. Compared with typical oral classroom communication, CMC allows each learner to 'talk' more when they participate in online discussion, resulting in the increased amount of output. This then is said to lead to the more diversed used of lexicon. Both registers found in asynchronous and synchronous CMC are said to show the characteristics of both the written and oral language styles of communication.

Again, referring to Table 2.2 above, the synchronous CMC normally demands for immediate response. Hence the time allows for processes like planning, decoding and encoding was shorter as compared to asynchronous CMC which allows for delayed response. Unlike asynchronous CMS, demand for immediate response also causes the interactants in synchronous CMC not to have enough time to look for outside resources and include them in the communication. The interactants of synchronous CMC are required to be present in order to generate immediate response while the interactants of asynchronous CMC can be absent and provide their responses later as delayed responses are normally expected.

In addition, Lapadat (2002) who claimed that the writing found in asynchronous conferences were more formal compared to synchronous conference which displays more spoken like language. Furthermore, she stated that the participants of asynchronous conferences normally would have ample time to think before they replied to others' postings, causing them to produce more carefully crafted, content-laden, lexical dense, coherent and complete writing product. Baron (2010) stated that CMC resembled spoken discourse in terms of the heavy use of first and second personal pronouns and CMC resembled the written discourse in terms of the use of complex syntax and a wide variety of lexical choices by the interlocutors when they interact with one another. According to Murray (2000), CMC in general should be perceived as a

24

hybrid register in which it displayed both written and spoken discourse features. In recent years, CMC tools have been widely employed by instructors as teaching and learning tools. This has given rise to the concept called Computer Supported Collaborative Learning (CSCL). The following section thus will elaborate the use of CMC tools in CSCL context.

2.5.3 Computer Mediated Communication (CMC) and Computer Supported Collaborative Learning (CSCL)

The use of technology has altered the traditional teaching and learning methods used in educational setting. One of the ideas that emerged from the use of technology in educational setting is called Computer supported collaborative learning or CSCL. Computer supported collaborative learning conveys the idea of utilizing the technology to support collaborative learning. It is attainable due to the advancement of science and technology which results in the availability of a lot of cutting edge CMC tools. The nature of CMC tools allows interaction to take place without being constrained by time and space factors. This means that interaction among people can occur at any place and at any time. This characteristic of CMC tools has made CMC tools an alternative to be used in implementing collaborative learning. Educators worldwide have long recognized the importance of collaborative learning in constructing and sharing new knowledge (Nor, Razak, & Aziz, 2010; Swan, 2005). A number of research studies have recognized collaborative learning as vital in order to inculcate higher order thinking skills among learners (Brindley, Blaschke, & Walti, 2009; C. Cheong, Bruno, & Cheong, 2012). Collaborative learning is practised because it affords learners to engage themselves in a shared world of knowledge sharing and knowledge formation. This is in line with the view of Vygotsky (1978) who underscored the importance of sustained social interaction and shared social context in developing higher order thinking. In this

shared world of collaborative learning, learners interact with one another through engaging in ongoing discussion and debate in order to complete the task assigned by instructors. Completing the task collaboratively necessitates the learners to exercise higher order thinking skills and this in turn improves learners' thinking skills. Computer mediated communication tools such as weblog, chat rooms, threaded discussions, emails, videoconferencing are examples of tools that can be used as instructional tools by educators to promote the culture of working collaboratively among the learners (Corich, Kinshuk, & Lynn, 2004; K. M. Li, 2010; Lim, Cheung, & Hew, 2011). CSCL is said to assist learners to co -construct new knowledge through interactions with one another in online learning environment. Thus, apart from the everyday face-to-face instruction, CSCL provides both learners and instructors an additional teaching and learning channel where knowledge can be formed, transmitted and shared as long as the selected CMC tool can be accessed.

One of the theoretical perspectives that embraces the idea of using CSCL in actualizing active learning among learners is Vygotsky's sociocultural theory. Sociocultural theory has been influential in teaching and learning contexts (Dixon & Verenikina, 2007). Sociocultural theory which highlights the importance of sociocultural interactions in learning has contributed to our understanding of CSCL. Vygotsky (1978) claimed that social interaction is critical to cognitive development. Sociocultural theory has further given rise to another two important concepts which are known as zone of proximal development and social constructivism. As cited by Chaiklin (2003), Zone of Proximal Development refers to "the distance between the actual level of development as determined by independent problem solving [without guided instruction] and the level of potential development as determined by problem solving under adult guidance or in collaboration with more capable peers". Social constructivism can be viewed as a learning theory which highlights meaningful learning that take place when individuals

involve in social, collaborative activities (Swan, 2005). Thus, according to sociocultural theory and the other two concepts i.e zone of proximal development and social constructivism, collaborative learning is deemed important in the forming of new knowledge. Furthermore, the availability of Internet and CMC enables collaborative learning to be carried out in online learning environment without being restrained by time and space factors. Social constructivism theory also acts as one of the principles that guides the formation of Community of Inquiry framework by Garrison et al (Swan, 2005). Garrison, Anderson and Archer (2000) designed Community of Inquiry framework (CoI) to investigate online learning. They suggested that the elements presented by this framework are important in ensuring a fruitful online learning experience. In the next section, information regarding Community of Inquiry (CoI) will be outlined.

2.6 Community of Inquiry (CoI)

Community of inquiry has been used extensively as a framework to study online learning that involves the use of CMC tools; for instance, threaded discussion (Garrison, et al., 2000). Similarly, this study uses the data collected from threaded discussion which was used as tool for e- learning in two postgraduate courses. The next section will present the basic introduction of Community of Inquiry, definitions of the elements embedded within community of inquiry framework and studies associated with community of inquiry (CoI) framework. The purpose of this research is to assess the critical thinking performance of the postgraduate students in e-learning context, i.e. the asynchronous online discussion hosted by Moodle. In line with the purpose of this study, it is deemed important to look into CoI model in detail. This is because the CoI framework concerns primarily with how e-learning can be adopted as an avenue to create a group of socially interdependent, collaborative learners who can think critically.

CoI frameworks reveals the three keys elements that would determine the success of creating a virtual learning space which can encourage learners to think critically and afford them to continue sharing, negotiating and constructing knowledge together. Therefore, by familiarising oneself with the concept of CoI framework, one can gain a better understanding of e-learning and the importance of a successful e-learning in encouraging its learners to think critically.

2.6.1 The Community of Inquiry (CoI) framework

Underpinned by both John Dewey educational philosophy and constructivism learning theory, Community of Inquiry (CoI) is the theoretical framework designed by Garrison et.al (2000). This is because Garrison et.al. (2000) intended to provide online learning educators and researchers a conceptual framework that can be used to describe the ways CMC tools can be used to create an online learning environment that is able to encourage critical thinking among the learners who work collaboratively in sharing, negotiating and constructing knowledge. Garrison et.al (2000) believed that in order to produce learning experience in online learning environment, a community that consists of a group of individuals engaged in collaborative learning and critical inquiry process should first be established. Garrison et.al. (2000) have further elaborated on the three types of presence by supplying indicators that signal the presence of each element in online learning environment. Along with the availability of the indicators aimed to describe each presence more explicitly, CoI framework could be seen as a type of resource for online educators to refer to when it comes to the design and implementation of online learning. To ensure the presence of the three core elements, online educators can design and implement online learning in such a way that promotes the presence of these indicators which then results in gaining a rewarding educational experience in the online learning context. As cited by Groen and Li (2005), Garrison et.al (2000) suggest "a worthwhile educational experience is embedded within a Community of Inquiry that is composed of teachers and students….learning occurs within the community through the interaction of three core elements: cognitive presence, social presence and teaching presence" (p.88). Community of Inquiry (CoI) framework is shown in Figure 2.1 on the next page.

Community of Inquiry
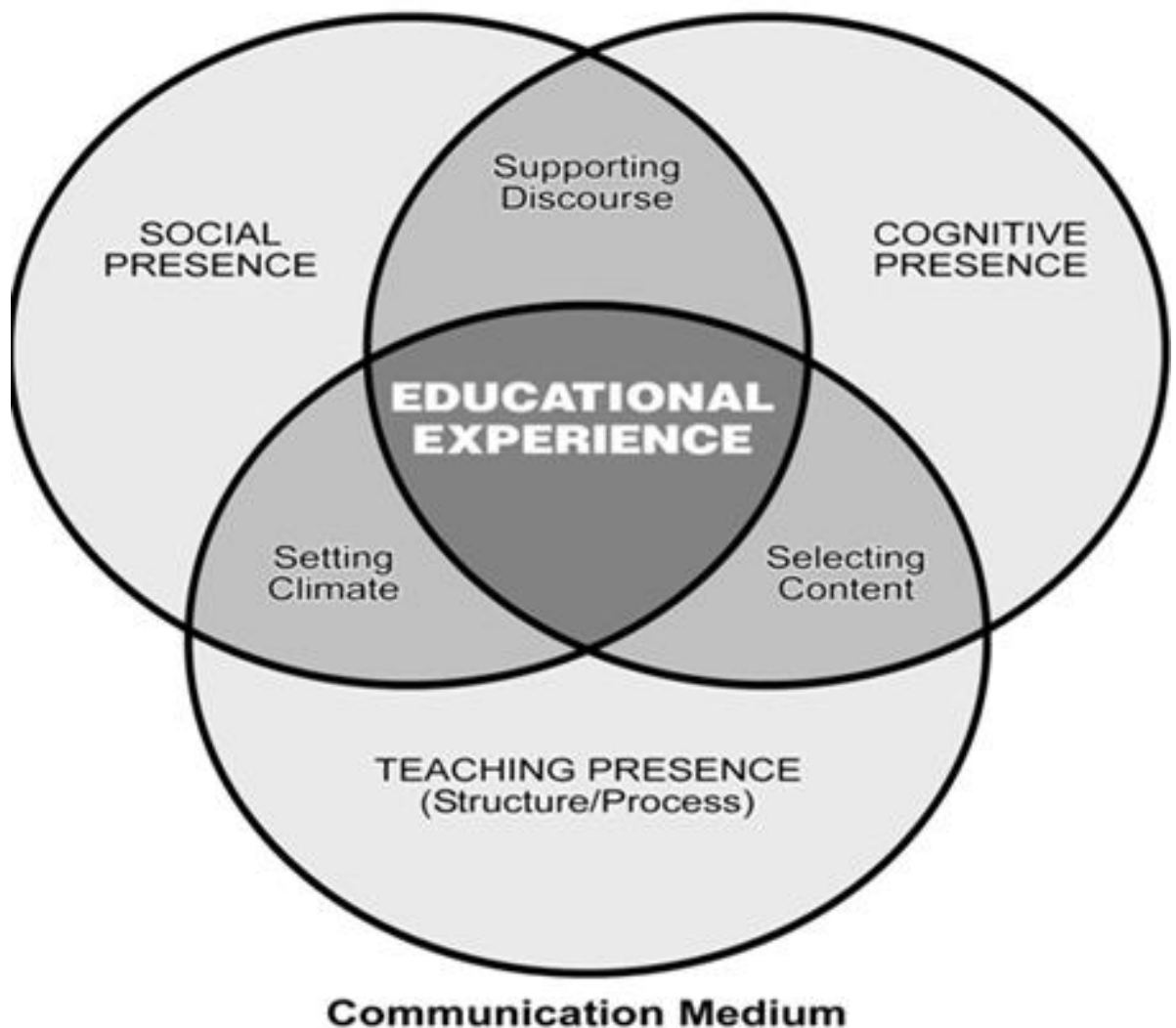
Figure 2.1: Community of Inquiry (CoI) adapted from Garrison and Arbaugh (2007)

Community of inquiry has three overlapping elements, namely social presence, cognitive presence and teaching presence. Cognitive presence is the focus of this study. This is because cognitive presence is linked to a problem solving process which made up of four phases and Garrison et.al (2003) claimed that this four-phase problem solving process is linked to the use of critical thinking skills. In other words, it is crucial to ensure the successful development of cognitive presence in online learning world. This is because with the successful establishment of cognitive presence, critical thinking can be fostered and sustained in a collaborative e-learning context where learners reflect

meaningful and deeply on a certain problem or issue being raised. The notion of cognitive presence is also addressed in the practical inquiry model. Practical Inquiry Model has been widely employed by other researchers to assess critical thinking found in computer mediated communication (CMC). The next section will outline the definition of the three types of presence as depicted in the CoI model above.

2.6.2 Definitions of Social Presence, Cognitive Presence and Teaching Presence

Figure 2.1 shows the Community of Inquiry (CoI) and there are three types of presence which overlap with one another. Garrison et al (2000) offered definitions for each type of presence in order to help the readers to understand the framework better. Social presence is "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (Garrison, 2000). Teaching Presence is "the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally, meaningfully and educationally worthwhile learning outcomes" (Garrison, Anderson, & Archer, 2001). Cognitive Presence is "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (Garrison, et al., 2001). Cognitive presence has been associated with the use of critical thinking skills in online learning environment (Garrison & Anderson, 2003). The simultaneous presence of three elements is crucial as they are interdependent with one another in affecting the overall quality of online learning.

Garrison et.al has also come up with Practical inquiry model as an attempt to operationalize the cognitive presence. Garrison et. al. (2001) mentioned that cognitive presence is reflected through the use of critical thinking skills that could be detected in online learning environment. Thus, Practical inquiry model has been used to

demonstrate the process of critical thinking that is likely to take place in online learning context where a community of critical learners is present (Garrison, et al., 2001). In the following section, information regarding practical inquiry model will be provided.

2.7 Practical Inquiry Model

Cognitive presence found in Community of Inquiry framework (CoI) is a term that links online learning to the application of critical thinking skills in a community of inquiry that works collaboratively to create and sustain the critical discourse towards higher - order knowledge construction (Garrison & Anderson, 2003). Practical inquiry model is a model that was created by Garrison et.al with the purpose of operationalizing cognitive presence. Operationalization of cognitive presence has enabled it to be detected and assessed in the form of critical thinking in online teaching and learning context where computer mediated communication tools are used (Garrison, et al., 2001). Figure 2.2 below shows the Practical inquiry model.
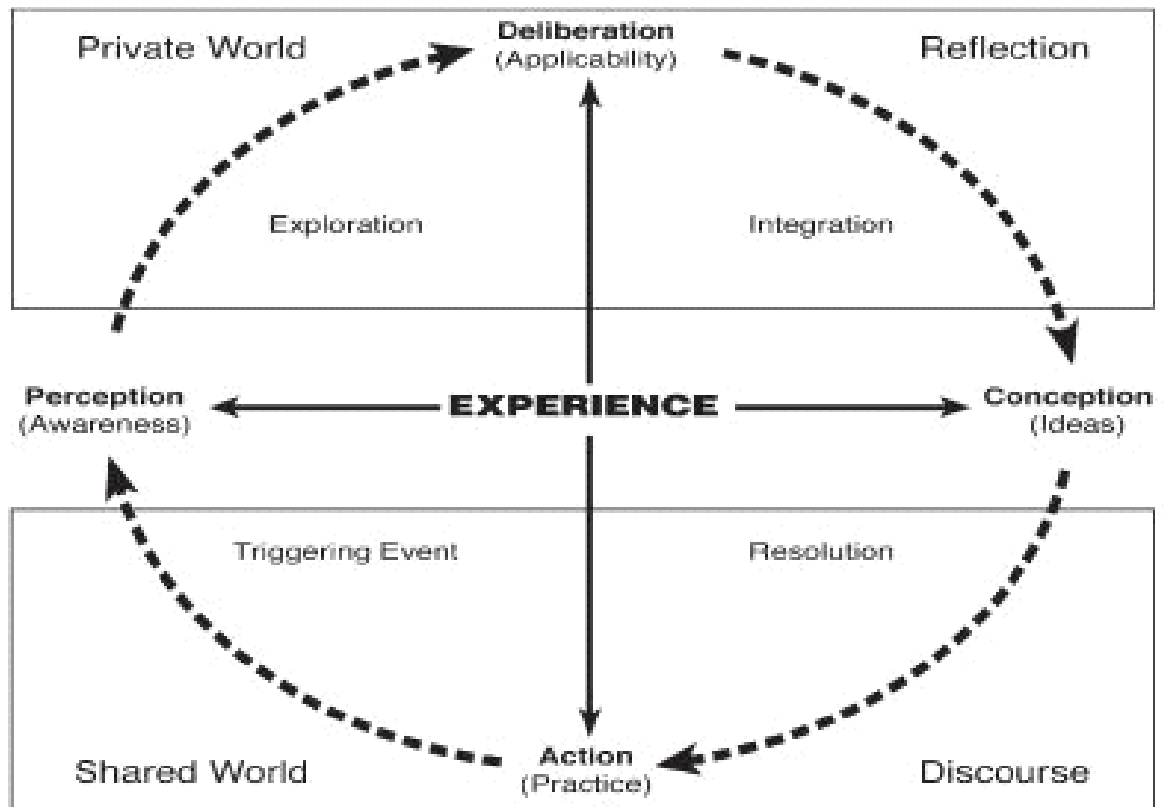
Figure 2.2: Practical Inquiry Model adapted from Garrison, Anderson &Archer (2001)

As demonstrated in Practical Inquiry Model, there are four phases. They are known as triggering event, exploration, integration and resolution. These four phases represent the problem solving process. As stated by garrison et.al（2000）, this four-phase problem solving process gives rise to critical thinking eventually. The first phase is known as triggering event which involves "Identifying or recognising an issue, dilemma or problem from one's experience, or articulated by the instructor or other learners" (Murphy, 2004). The second phase is known as exploration which involves the process of "thinking about ideas in both the private and social spheres in order to make preliminary decisions as to what information is relevant to the problem or issue" (Murphy, 2004). The third phase is known as integration where "generating or constructing meaning from the ideas in the Exploration phase, and integrating the relevant information determined in the previous phase" occurs (Murphy, 2004). The

fourth phase is known as resolution which has to do with "proposing a hypothetical solution, or applying a solution directly to the issue, dilemma, or problem. Students at this phase have clear expectations; can test hypotheses and ideas, and view content from a critical perspective" (Murphy, 2004). All the four phases mentioned in practical inquiry model are the fundamental elements that establish cognitive presence in online learning which is carried out using CMC (Garrison, et al., 2001). Practical inquiry model itself has also been used widely in assessing critical thinking in online learning context through content analysis method (Bai, 2009; Fahy, 2005; Maddrell, Morrison, & Watson, 2011; Murphy, 2004; Prasad, 2009). For instance, Prasad (2009) investigated the relationship established between critical thinking and teaching presence in asynchronous online discussion context. He used practical inquiry model to assess the critical thinking found in asynchronous online transcripts. Later he found that when teaching presence is increased, critical thinking level of learners also increased significantly.

By combining the four phases depicted in the practical inquiry model with Henri (1992) indicators of cognitive reasoning skills, Newman et.al (1995) devised the Newman et.al (1995) content analysis framework. The Newman et.al (1995) content analysis framework was employed to assess the critical thinking found in the data of this study.

2.8 Threaded Discussion

Threaded discussion is an asynchronous, text based mode of computer mediated communication (CMC) (Swan, 2009). Asynchronous threaded discussion also is known as online discussion (Arend, 2009). The communication in threaded discussion is reflected in messages sent by the participants and the communication is expanded through the continuous sending of messages by participants. The communication is not expanded linearly because several messages can be sent at the same time (Swan, 2009).

The nature of threaded discussion that allows teaching and learning to take place without having to have face -to -face interaction between instructor and learners is said to have lowered the affective filter among the foreign language learners (Perez, 2003). This is because threaded discussion has created non-threatening learning environment. Thus, threaded discussion is an alternative that encourages introvert learners to participate in the learning process by voicing their thoughts in threaded discussion (Lin & Chiu, 2008). In addition, compared with face-to face-instruction, learners are provided with equal chances to interact and voice their opinions regarding an open ended issue as hardly anyone can dominate the threaded discussion (Ellis, 2001). Learners can produce better responses which make up of suggestions, evaluation, justifications, and solutions towards the problems through threaded discussion when they are given ample time to study and reflect on the problems, questions posted by instructors and also on other learners' posts. Hence it promotes and improves critical thinking skills among the learners (Arend, 2009; Cheung, Hew, & Ling Ng, 2008) In the next section, studies regarding the effectiveness of threaded discussion in improving writing skills will be reviewed.

2.8.1 Threaded Discussion and Writing Skills

Asynchronous mode of CMC has been claimed by Blake (2000) as being able to develop writing skills among the learners. The data from Hadjistassou's (2008) study suggested that through the use of ACMC (Asynchronous Computer Mediated Communication) forum, students gradually could give more challenging, complex and constructive feedback to their peers using describing and narrating strategies. Along with that, writing skills of students have improved when they acquired and started to use more formal, sophisticated and complex language in giving feedback. Meskill and Anthony (2007) found that 9 out of 12 students who had participated in online

discussion claimed that their writing skill improved. According to the pilot study's findings by Kol and Schcolnik (2008), most of the students showed positive attitudes towards the integration of online discussion into the EAP course and most of them reported that their writings skills have improved. Ng (2008) proposed the use of online discussion to carry out writing tasks in language course because students can view everyone's writing and give comments to their peers after reading and pondering on their peers' writings. According to her, all these would help to improve the students' writing skills. In the next section, the review of several studies that were pertinent to the potential of the use of threaded discussion in terms of enhancing critical thinking skills will be presented.

2.8.2 Threaded Discussion and Critical Thinking

A number of studies have claimed that threaded discussion has the potential to develop and sustain critical thinking among the learners if it is used effectively (Ng, 2008, Arend, 2009; Prasad, 2009). As mentioned in the previous section, one of the reasons why threaded discussion can be an alternative to promote critical thinking lies with its asynchronous nature (Arend, 2009; C. M. Cheong & Cheung, 2008; Lim, et al., 2011; Prasad, 2009). This asynchronous nature allows participants to have ample time to read, ponder on others' posts and reflect on their own thoughts before posting it publicly. Other factors which are considered crucial in optimising the potential of threaded discussion in fostering critical thinking have been identified by researchers such as Qing Li (2004). Qing Li (2004) claimed that critical thinking is a crucial element in developing knowledge building community. She has listed factors that could boost the effectiveness of threaded discussion in encouraging critical thinking among students. The factors are known as *context, content, role of facilitator, format, organisation, design and development and assessment.* For instance, in terms of context, Qing Li (2004) proposed that establishing a friendly, safe, free and open online environment is vital for threaded discussion and this can be done by first asking the students to introduce among themselves. She also emphasised on the importance of taking issues such as learner-centerness, the use of authentic topics and tasks into account especially for those instructors who plan to carry out threaded discussion activities in the future. Encouraging students to give constructive feedback is pivotal as this gives rise to knowledge construction and it also helps foster critical thinking in the context of threaded discussion (Qing Li, 2004).

Instructors need to take all these factors into consideration before using threaded discussion with their students. Other researchers advocated the use of Socratic

Questioning Techniques by both instructors and learners in threaded discussion. Macknight (2000) and Yang et.al. (2005) investigated the effectiveness of using Socratic questioning techniques in promoting critical thinking in threaded discussion. For instance, the results reported by Yang et.al. (2005) indicated that the teaching and modelling of Socratic questioning techniques enabled students to exhibit a high level of critical thinking skills in asynchronous online discussion. In addition, several studies also highlighted the fact that the instructor's feedback plays a crucial role in improving the overall quality of threaded discussion. For instance, Cheong & Cheung (2008) mentioned that perhaps online instructors could practise the suggestion provided by McLoughlin (2000) that is by providing timely feedback for the students in order to facilitate critical thinking and interaction among the students. Likewise, Nandi, Hamilton, Chang and Balbo (2012) reported that the students relied heavily on the feedback provided by their instructors in discussion forum. This implies that their participation was likely to be influenced by the feedback of the instructors. For instance, the participants may alter their viewpoints or adopt new stance after reading the feedback given by their instructors. Feedback from the instructors was deemed important because they could motivate the students towards contributing better ideas into the discussion especially when the students aware that their postings would be examined by the instructors. The researchers also revealed that most students preferred the active engagement of instructors. One of the ways that the instructors can actively engage themselves in the discussion forum is by providing timely constructive feedback to the students. Another reason why the instructor's feedback was treasured by the students is it helps the students to stay on the right track when discussing the topic at hand. Apart from the instructor's feedback, topic familiarity can also be a crucial factor that will affect the quality of online postings. Chou and Chen (2010) conducted a study to investigate how culture may affect the Chinese students' perception with regards to

online learning through the use of asynchronous online discussion board in distance education programs in an American university. They reported that the subjects of their interview who consisted of six Chinese graduate students had stated that topic familiarity would be a factor that would determine their willingness to write postings. This also suggests that if they had prior knowledge towards a particular topic of discussion, they would have more and better ideas to contribute to the overall asynchronous online discussion.

2.8.3 Assessing Critical Thinking and Threaded Discussion

Assessing critical thinking found in threaded discussion transcripts using content analysis method is a typical method used by many researchers in order to reveal the critical thinking performance of the participants. Table 2.1 shows that there are four types of content analysis frameworks available for assessing critical thinking though in reality there may be more than four. This is because researchers are continuing to work on creating new assessing frameworks which they hope can be more reliable and valid in assessing critical thinking compared to the available ones. For the purpose of this research, content analysis scheme created by Newman, Webb and Cochrane in 1995 will be used to code the data gained from four threaded discussions.

The Newman, Webb and Cochrane content analysis scheme (1995) consists of a list of paired indicators. The pair indicators are subsumed under each characteristic of critical thinking. For instance, the characteristic of Relevance has been broken down into two indicators which are relevant statements (R+) and irrelevant statements, diversions (R-). Newman, Webb and Cochrane (1995) devised their positive and negative critical thinking indicators based on two earlier frameworks created by other researchers. One of the frameworks is known as the Garrison (1992) stages of problem solving which is

illustrated in the practical inquiry model and the second is known as Henri's (1991) cognitive reasoning skills indicators (Newman, et al., 1995).

The Newman, Webb and Cochrane content analysis scheme (1995) has been widely used to assess critical thinking found in asynchronous computer mediated communication transcripts. Asynchronous computer mediated communication meant here are the threaded discussion and weblog. The reason why researchers such as Irfan &Noor Hazita (2010), Woo &Wang (2009) and Song &Chan (2009) used Newman, Webb and Cochrane (1995) framework to assess critical thinking is its comprehensiveness of indicators in capturing critical thinking elements found in asynchronous computer mediated communication transcripts. The other reason being critical thinking performance could be quantified using this framework as critical thinking ratio can be attained using the mathematical formula provided. The mathematical formula is X+ -X-/X+ +X-. This formula is used to find out the critical thinking ratio for each characteristic of critical thinking. X+ refers to the total number of coded statements under positive indicator while X- refers to the total number of coded statements under negative indicator for a particular characteristic. For example, based on the mathematical formula provided by Newman, Webb and Cochrane (1995), for the characteristic of relevance, if the 10 statements were coded under the Relevant statement (R+) indicator while 4 statements were coded under the Irrelevant statement, diversion (R-) indicator, then the critical thinking for relevance category would be 10-4/10+4=3/7 or in decimal value which is 0.429. The section below will describe the studies which employed Newman et.al. (1995) content analysis scheme to assess critical thinking in asynchronous computer mediated communication.

2.8.4 Assessing Critical Thinking by using Newman et.al. (1995) Content Analysis Framework

Woo and Wang (2009) conducted a study to find out whether web blogging was effective in encouraging critical thinking. They were also interested in investigating the influence of different kind of blogging topic has on the overall results of the frequency of each critical thinking indicator. Their participants were secondary school students. The three topics of web blogging were designed based on secondary school History subject syllabus. The scheme they used to code their web blogging transcripts was the Newman et.al (1995) content analysis method. They designed three topics for students to discuss. The similarity found among the three threaded discussions' findings was that R+ (Relevant statements), O+ (Referring to outside knowledge/experience) and JS+ (Justified statements) indicators were the three most frequent detected critical thinking indicators in all the three web blogging transcripts. They also claimed that because the topic 1 and topic 3 allowed the students to use the information from the textbooks to substantiate their arguments, the C- (Uncritical acceptance or unreasoned rejection) percentage reported was insignificant as it was too small a value. On the other hand, topic 2 was designed in such a way that the participants could not rely solely on the textbook information to support their arguments. This caused the overall negative criticalness of topic 2 increased and C-(Uncritical acceptance or unreasoned rejection) percentage of topic 2 turned out to be significant. Their findings again showed that the importance of being able to include relevant outside materials to their web blogging writings as this could be a crucial key to improve the participants' overall critical thinking performance. They also recommended that the teachers should teach the students on how to look for relevant outside information and integrate the new information they gained into their weblog instead of merely depending on the information found from the textbooks.

Song and Chan (2009) also attempted to investigate the critical thinking performance among their participants. They designed 4 topics of online discussion in which each cover a topic of the semester. The 4 topics of online discussion were related to the content delivered during formal lectures. They gauged the critical thinking performance found in their data based on the Newman et.al content analysis framework as well. In their findings, they stated that O (Referring to outside knowledge/experience) indicator ratio was found to be the highest in all four online discussion transcripts. In addition, the R+ (Relevant statements) and I+ (Important points) indicators were said to be consistently exhibited throughout the four topics of online discussion. This was because it seems that the number of statements coded under R+ (Relevant statements) and I+ (Important points) indicator did not differ greatly throughout the four topics of online discussion. Song and Chan (2009) also reported that there was improvement found in the critical thinking ratio of each critical thinking indicator as their participants progressed from topic no.1 to topic no.3. However, when it came to topic no.4 threaded discussion, the critical thinking ratio of each critical thinking indicator dropped and from the comments they gathered from their participants, the researchers attributed the poor performance in topic 4 to ill-structured topic of discussion and time constraint faced by their participants. In terms of time constraint, the researcher pointed out that at the time topic no.4 was set for discussion, it was near the end of semester and at that period of time their participants had to rush in finishing and submitting the other assignments. This probably caused them to contribute less quality input in topic no. 4 threaded discussion. Therefore, the timing concerning when online discussion task was launched probably may affect the overall participants' critical thinking performance in online discussion.

Employing the Newman et.al. (1995) content analysis scheme to assess the critical thinking performance, Irfan and Noor Hazita (2010) examined the trainee teachers'

online discussion forum transcripts with the aim of finding out the positive critical thinking and negative critical thinking indicators that were exhibited in the transcripts. As mentioned by Irfan and Noor Hazita (2010), the subjects of their study were all novices when it came to teaching. In other words, they did not have any teaching experience prior to their teaching practice. The online discussion forum was launched during their teaching practice in order for them to interact with their peers and lecturer. They could share, discuss and reflect on the problems they encountered during teaching practice. It was found that the postings of the trainee teachers mainly reflected the aspects of relevance(R+), importance (I+) and justification (JS+). However, the postings seldom portrayed the attempt of the trainee teachers to bring in outside knowledge or experience to address the issue. Besides that, one of their findings was that C+ (Critical assessment of others' or own contribution) indicator was one of the six least found positive critical thinking indicators, rendering the researcher to assert that their subjects of study might be weak in their ability to evaluate their peers' and their own postings critically.

In sum, the above sections outline the studies regarding critical thinking and the ways the computer mediated communication can afford the manifestation of critical thinking based on the community of inquiry framework and practical inquiry model. In addition, the above sections also present the assessment of critical thinking where specific attention is given to the matter of assessing critical thinking found in asynchronous online discussion transcripts. This study also aimed to investigate how the use of grammatical cohesion may reflect critical thinking performance of participants in the asynchronous online discussion. Therefore, the rest of the literature review chapter will cover studies related to cohesion. The following section will describe the Halliday and Hasan (1976) taxonomy of grammatical cohesion where specific attention will be given to elaborate the concept of grammatical cohesion. In line with the focus of the study,

the use of grammatical cohesion in reflecting critical thinking will be investigated and the grammatical cohesion framework developed by Halliday and Hasan (1976) will be used as the data analysis framework for this study. To date, Halliday and Hasan (1976) taxonomy of grammatical cohesion is still widely used as research framework where cohesion and coherence studies are concerned although it has been created quite a long time ago. This is probably because this framework is influential in which it marks the establishment of cohesion theory. The emergence of this cohesive framework also has brought about with it the growing interest of scholars in studying cohesion and coherence related matters from different perspectives (Xi, 2010). In addition, it is deemed as the first cohesion framework which is well organized and comprehensive in terms of identifying, categorising and subcategorising the cohesive devices. It has also served as the foundation for other scholars who attempted to modify or create new categories and subcategories of cohesive devices.

2.9 Halliday and Hasan (1976) Cohesion Theory

The notion of cohesion as proposed by Halliday and Hasan (1976) is important because they claimed that cohesion ensures textual coherence of a text (Hinkel, 2001). Cohesion does so by connecting the linguistic forms such as words, phrases or clauses together through the use of cohesive devices. According to Halliday and Hasan (1976,p.2), cohesion exists when the interpretation of the elements is relied upon another element. In other words, cohesion allows the readers of a text to refer to other elements in order to make sense of the targeted elements successfully. Cohesion is further broken down into two types (Halliday and Hasan, 1976). The first type is known as grammatical cohesion which is also the focus of this study and the second type is known as lexical cohesion. The term, cohesive tie, however, is used to refer to a single instance of cohesion. This single instance of cohesion signals the occurrence of a pair of items that

are related cohesively (Halliday &Hasan, 1976). Halliday and Hasan also claimed that intersentential cohesion is more significant than intrasentential cohesion. According to Halliday and Hasan (1976, p.9), cohesive ties between sentences attract more notice because they are the single source of textual, whereas within a sentence there are also structural relations which act as cohesive strength that make the sentence hang together. Grammatical cohesion framework constitutes of four types of cohesive devices; namely reference, substitution, ellipsis and conjunction. In the next section, the explanation regarding the reference cohesive device will be outlined.

2.9.1 Reference

Reference is a type of cohesive device that allows readers to refer to the elements occur before or after the targeted element in order to obtain enough information to interpret the targeted element successfully. Reference is further categorised into anophoric reference and cataphoric reference based on their direction of referring. Anaphoric reference is a word in a text which refers to the other ideas appear before it in order to recover its meaning. In contrast, cataphoric reference means a word refers to ideas appear later in the text. In addition, reference also has been categorised into three types based on the grammatical resources that form the reference items. The three types of reference are the personal reference, demonstrative reference and comparative reference where each can act either as anaphoric or cataphoric reference. However, based on Chafe's Activation Cost Theory, as cited in Gao (2012), states that the paucity of cataphora found in his research data was because the interpretation of cataphora demanded higher cognitive cost. In other words, in order for the readers to be able to compute the instances of cataphora, more cognitive effort was demanded from the readers.

Personal reference is realized through the use of personal pronouns (I, you, we, they, he, she, it), possessive adjectives (my, its, your, his, her, our, their) and possessive pronouns (mine, yours, his, hers, its, ours, yours, theirs). Based on Halliday and Hasan (1976, p.51), the first personal and second personal pronouns (I, we, you) are recognized as speech roles. The first personal pronoun 'I' is used to identify oneself and his viewpoints. Hyland (2009) mentioned the following,

> "by marking your views with the first person, you leave readers in no doubt of your stance while claiming credit for what you are saying. It is a powerful way of demonstrating an individual contribution and establishing a claim for priority."

The personal pronouns such as "we", "us" and "our" are known as inclusive pronouns. The use of these inclusive pronouns contributes to the construction of group cohesion (Garrison et.al., 2000). Group cohesion is important in sustaining social presence of the online learning world. On the other hand, third personal pronouns (he, she, it, and they) will be typically used endophorically, in a way that it refers anaphorically to the referents. Halliday and Hasan (1976, p. 57) also stated that most of the occurrences of third person forms are anaphoric although there are in fact instances where third person forms are cataphoric. Halliday and Hasan (1976, p.56) further stated, however, that even if these instances are cataphoric reference, they do not contribute to textual cohesion because cataphoric reference is structurally determined.

Last but not least is the use of second singular personal pronoun 'you'. The second personal pronoun 'You' was used to address the specific participant or other participants in general in order to draw their attention towards the issues under discussion and in this case, the second personal pronoun 'you' functions as vocative. The use of 'you' to address or refer to other participants in computer mediated

communication context helps in constructing social presence (Garrison et.al., 2000). As cited by Rasti (2011), Kitagawa and Lehrer (1990) claimed that the impersonal use of 'you' brought with it the general referent to people at large, without acting as specific reference. Kitagawa and Lehrer's (1990) claim of impersonal use of 'you' is further supported by Quirk and Greenbaum (1990) where they stated that the personal pronoun 'you' can act as generic reference. The section below shows the three examples of the use of pronoun 'you'.

Demonstrative reference is realised by nominal demonstratives (this, these, that and those) and adverbial demonstratives (here, there, now and then) (Halliday and Hasan, 1976, p 57). Comparative reference was further divided into two types, namely the particular comparison and general comparison. General comparison is realised by deictic items that functions to express likeness and differences between things. Particular comparison is realised by numerative and epithet elements. Examples of numerative elements are same, similar, similarly, likewise, identical, identically, different, differently and otherwise. Examples of epithet elements include more, fewer, less, further, comparative adjectives such as taller and comparative adverbs. Examples of the anaphoric reference are presented in Appendix A (i), followed by the examples of the cataphoric reference in Appendix A (ii), personal references in A (iii), demonstrative reference in A (iv) and comparative reference in A(v). Next, the details regarding the substitution cohesive device will be presented.

2.9.2 Substitution

Substitution is a second type of cohesive device which allows the replacement of the linguistic item by another. There are three types of substitution; namely, nominal substitution, verbal substitution and clausal substitution. The substituents for each type of substitutions differ. The substituents for nominal substitution are 'one' and 'ones'.

The substituent for verbal substitution is the verb 'do' and the form 'do so'. The substituents for clausal substitution are the words 'so' and 'not'. The examples of the nominal substitution are presented in Appendix A (vi), followed by the examples of the verbal substitution in Appendix A (vii) and the clausal substitution in Appendix A (viii). Next, the third type of cohesive device which is known as ellipsis will be described.

2.9.3 Ellipsis

The third type of cohesive device is known as ellipsis. Ellipsis concerns with the omission of the items. It is equivalent to substitution in zero. There are three types of ellipsis. They are known as the nominal ellipsis, verbal ellipsis and clausal ellipsis. The examples of the nominal ellipsis are presented in Appendix A (ix), verbal ellipsis in Appendix A (x) and clausal ellipsis in Appendix A (xi). Next, the fourth type of cohesive device which is known as conjunction will be described.

2.9.4 Conjunction

The fourth type of cohesive device proposed by Halliday and Hasan (1976) is known as conjunction. According to Halliday and Hasan (1976), conjunction is made up of any connectives words or expressions that link the two of more clauses or sentences together in order to produce coherent relations. Halliday and Hasan (1976) further divided conjunction into four types of semantic logical relations; namely, the additives, the adversatives, the causals and the temporals. The overview of Halliday and Hasan conjunctive relations (1976) is presented in Table 2.3 on the next page.

Additive	Simple	and, nor, or 19) She broke her legs. *And* she had to quit the dancing competition.
	Complex	furthermore, alternatively 20) He is old and unpopular. *Furthermore*, he has at best only two years of political life ahead of him.
	Apposition	that is, for instance 21) Ways to safeguard our mother Earth are many. *For instance,* people can practise carpooling in order to reduce the pollution.
	Comparison	likewise, in the same way 22) The clams were delicious. *Likewise,* the eggplant is excellent.
Adversative	Adversative 'proper'	yet, but, however 23) Yesterday she fell sick *but* she still went to work as usual.
	Contrastive	in fact, on the other hand 24) They informed him that her car was only worth RM6000. *In fact* it was worth RM 8000.
	Correction	instead, rather 25) One year ago, he decided not to work with his current company anymore. *Instead,* he planned to set up his own company and become a boss himself.
	Dismissal	in any case, anyhow 26) He cannot leave the country for this moment. *In any case,* he needs to solve all the company problems

		first.
Causal	Causal, general	so, consequently 27) She always forgets to lock her house gate. **Consequently**, her house has been broken in by burglars for several times.
	Causal, specific	for this reason, as a result 28) Mary likes to study History. **For this reason**, she becomes a History teacher.
	Reversed causal	for, because, it follows 29) Mary rejected her friend's invitation to the party last night **because** she preferred to stay at home and rest.
	Conditional	in that case, otherwise 30) Ali should act fast in applying for the scholarship to study abroad. **Otherwise,** he would not be able to submit his application on time.
	Respective	in this respect, aside from this 31) Everything goes on smoothly in the wedding hall **aside from** the lousy sound system.
Temporal	Temporal, simple	then, precisely 32) The human resource department will first weed out unqualified applicants during the HR meeting. **Then** they will hold the first interview session with the qualified applicants.
	Complex	at once, meanwhile, until then 33) We have to wait for the official report from the authority concerned before

		we can start our business. ***Meanwhile***, we have to concentrate on renovating our restaurant.
	Internal temporal	next, secondly, then 34) ***Firstly***, we have to wash and peel the potatoes. ***Secondly***, we have to cut them into small cubes.
	Correlative forms	first….then, in the end, finally 35) Due to the overwhelming anxiety, she forgot half of the lyric during the singing competition. ***In the end***, she lost the competition.
	"Here" and now"	up to now, from now on 36) The examination is just around the corner. Thus, ***from now on***, Ali would have to start to study hard in order to excel in the examination.
	Summary	to sum up, in short, briefly. 37) ***In short***, there are five ways that have been mentioned by the author regarding the ways to prevent AIDS.

Table 2.3: Overview of Conjunctive Relations Adapted from Halliday and Hasan (1976, p. 242-243)

The section 2.9 describes the Taxonomy of Grammatical Cohesion established by Halliday and Hasan (1976). In sum, there are four types of cohesive devices identified by Halliday and Hasan (1976), namely the reference, substitution, ellipsis and conjunction.

With regard to the fourth type of cohesive device i.e the conjunction, many scholars have offered their own classification and semantic functions to the conjunctive items. For instance, the additive conjunction 'also' was named as conjunctive adverbial by Celce- Murcia &Larsen- Freeman (1999) or conjunct by Quirk and Greenbaum (1990). In terms of the additive conjunction 'and', Celce- Murcia & Larsen -Freeman (1999) and Quirk and Greenbaum (1990) named it as coordinating conjunction. Greenbaum and Quirk (1990) who named the conjunction 'and' as coordinator mentioned that 'and' indicates that 'there is some relation between the contents of the linked clauses'; for instance, 'and' can be used to show that 'the event in the second clause is chronologically sequent to that in the first' and 'the event in the second clause is a consequence or result of the event in the first. Celce-Murcia and Larsen Freeman (1999) also stated that the coordinator 'and' can be used as logical operator, inferential connective or as a marker which signals the speaker continuation. Ying (2009) stated that the conjunction 'and' can express the additive, adversative, causal and temporal sense depending on the context where the conjunction 'and' was detected.

In terms of the adversative conjunction 'but', Halliday and Hasan (1976) stated that the conjunction 'but' can express either the adversative or the contrastive sense of meaning depending on the context where it is found. Greenbaum and Quirk (1990) who named the conjunction 'but' as coordinator claimed that 'but' can be used to indicate either "the content of the second clause is unexpected in view of the content of the first" or "the second clause expresses in positive terms of what the negation in the first clause conveys." Celce-Murcia and Larsen- Freeman (1999) also stated that the coordinator 'but' can be used to conveys three types of semantic meaning. Firstly it is used as the marker that expresses the denial of expectation. Secondly, it is used as the marker that demonstrates the semantic contrast and thirdly it is also used to signal the speaker's return especially in recovering the lost point when the other speaker digressed from the

main points. Bell (2007) who studied the pattern of occurrences and functions of sentence initial 'But' in academic writing claimed that generally sentence initial "But" plays three major functions. The functions of sentence initial "But" are firstly to coordinate ideas; secondly, to develop arguments, and thirdly, to shift the topic domain. Bell (2007) further reported that out of the three major functions, sentence initial "But" was mostly used in developing argument. It is said that by cancelling and refining the previous argument, sentence initial 'BUT' helps in developing argument. According to Halliday and Hasan (1976), the adversative conjunction 'however' has two semantic meanings. The first semantic meaning is it expresses the sense of 'contrary to expectation' and the second is its use to express semantic contrast. Celce- Murcia and Larsen-Freeman (1999) categorised 'however' under adversative conjunctive adverbial category and they stated that 'however' not only can be used to express semantic contrast, but it can also be used as a topic shift marker. Below are the three examples of sentences in which each adversative conjunction 'however' conveys different semantic meaning.

(I)   'However' that expresses the sense of 'contrary to expectation'

He is not a hardworking student. **However,** *he has performed well in his final year exam recently.*

(II)   'However' that expresses the sense of semantic contrast

Soo is an introvert and she lives in solitude. **However,** *her sister is an extrovert who loves hanging out with friends.*

(III)   'However' that is used as a topic shift marker

My house was broken into by a burglar last night. **However,** *let's talk about something else.*

Next, when causal conjunction is concerned, 'because' was widely known as a subordinating conjunction (Quirk and Greenbaum, 1990; Celce- Murcia and Larsen-Freeman, 1999).and 'so' was known as a coordinating conjunction (Celce -Murcia and Larsen- Freeman, 1999). Lopes (2009) who studied the causal conjunction 'because' from the pragmatic coherence relations perspective, stated that the causal conjunction 'because' could be used to express both justification and cause and effect relations. In their study of the argumentative writing, Prommas and Sinwongsuwat (2011) found that the conjunction 'because' was used by both Thai learners and native speakers to state reasons more than cause. The researcher stated that this observation was caused by the fact that the argumentative writing genre often requires the students to provide reasons to support their claims; rendering them to use 'because' to state the reasons more frequently than using it to express cause and effect relation.

As for temporal conjunction, Celce -Murcia and Larsen- Freeman (1999) named conjunction such as 'then' and 'first' as sequential conjunctive adverbial. Greenbaum and Quirk (1990) on the other hand, named both 'then' and 'first' as conjunct which have the semantic meaning as enumerative. In the following section, several studies related to grammatical cohesive devices will be outlined.

2.9.5 Studies Related to Grammatical Cohesive Devices

Al Jarf (2001) conducted a study to investigate the difficulty the participants faced in processing the four types cohesive devices, namely, the conjunction, ellipsis, substitution and reference. The subjects of her study were 59 female college students who are native speakers of Arabic and their major was English –Arabic translation. The subjects of her study were taught to know the five cohesive devices, namely, conjunction, ellipsis, substitution, reference and lexical cohesion, and they were then tested. Lexical cohesion, however, was not the subject for the testing. They were given a

reading text and were required to detect all the cohesive devices found in the text. The tasks include listing the referents of each of the anaphoric and cataphoric references, identifying the correct words and phrases for each substitute and identifying the conjunctions and last but not least, recovering the elliptical information by supplying the omitted words or phrases. After that, their end products were marked. From the marking, the researcher found that processing substitution was the hardest task for her subjects of the study in terms of identifying the correct words and phrases for each substitute, followed by processing reference and ellipsis, while processing conjunction was the easiest task to complete as the subjects were able to identify 70% of the conjunctions. In terms of the difficulty level of each cohesive tie, the researcher found that substitution is the most difficult cohesive devices, followed by ellipsis, reference and conjunction.

Chawwang (2008) investigated the reading problems related to sentence structure, vocabulary and reading comprehension encountered by Thai 12th grade students. One of the findings stated by Chawwang (2008) was that sentence structures that were made up of substitution and elliptical expressions were recognised as difficult structures for students. This is because only 30% of the students managed to answer the question about substitution correctly and less than 30% of students able to answer the questions related to elliptical expressions correctly. Chawwang (2008) further stated that elliptical expressions was perceived as difficult by the participants as elliptical expressions involve omission of information that often leads to unclear meaning and reading problem.

Taboada (2000) who examined the cohesion in spoken discourse discovered that ellipsis and substitution were not favored by the speakers. She assumed this may be due to the fact that ellipsis and substitution both demanded the speakers to put extra effort in order

to be able to interpret the elliptical and substitution reference successfully. This process would likely to impose extra burden on speakers' mind.

Studying the cohesive devices found in argumentative essays, Alacon and Morales (2011) found that reference apparently was the most frequently used cohesive device. Conjunction was the second most frequently used cohesive device in argumentative essays right after references and substitution was the least found cohesive device. However, Alacon and Morales (2011) did not report their findings on the use of ellipsis device. In terms of the frequency of reference cohesive devices, they found that in their data, demonstrative non selective reference scores the highest percentage of used, followed by personal- existential head reference and personal possessive modifier. Comparative reference overall is the least used reference device. When conjunction is concerned, they reported on the five types most frequently used of conjunction. They discovered that extension-addition –adversative type is the most frequently used conjunction, followed by extension-addition-positive conjunction, enhancement-causal-conditional-general conjunctions, enhancement-causal-conditional-concessive and the enhancement-manner-means conjunction. Their findings imply that both reference and conjunction are likely to be two pivotal cohesive devices one employs to establish logical arguments.

Therefore, concluding from the studies reported above, it seems that the subjects of the studies generally faced problems when it came to the use of the substitution and ellipsis devices. Consequently, this may cause the participants to avoid using substitution and ellipsis in their daily English tasks. On the other hand, the participants generally intended to use conjunction and reference devices frequently. This is likely because the participants may have mastered the skills of using conjunction and reference devices correctly and aptly. They may also have the tendency to use conjunction and reference devices to link ideas and to establish sound arguments since Alacon and Morales (2011)

found that the subjects of their study used conjunction together with reference frequently during the writing of argumentative essay.

2.10 Conclusion of Chapter 2

Chapter 2 outlined the literature that is pertinent to the interest of this current study. For example, firstly, this chapter presented the definition of critical thinking, the teaching of critical thinking and the assessment of critical thinking. Next, it continued with the review of computer mediated communication (CMC) related literature. Thirdly, this chapter also presented the literature related to Community Inquiry Model (CoI), Practical Inquiry Model, Newman et.al (1995) content analysis framework and lastly it outlined Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion and the review of several studies related to grammatical cohesion.

In the next chapter, the research methodology adopted by the researcher of this study will be described. The next chapter will cover four aspects which are known as the research design, the participants and setting, the data collection procedure and the data analysis.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

It seems apparent that being able to foster critical thinking among the students has become a shared goal for global tertiary educational institutions. In line with this emerging goal of education, this study chose to focus on critical thinking matter by investigating how the use of grammatical cohesive devices in asynchronous online discussion reflects the critical thinking of participants of this study.

This chapter outlined a detailed explanation of the methodological procedures used in this study. It included the research design, the information of the participants and setting, the instruments used and finally, how data were gathered and analysed.

3.2 Research Design

To date, there are many researchers who have tried to define mixed methods research. For instance, Johnson, Onwuegbuzie and Turner (2007) came up with their definition of mixed methods research. Their definition of mixed method research is stated as below:

> "Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration (p.123)."

Creswell (2011) claimed that from the definition above, it seems that Johnson, Onwuegbuzie and Turner (2007) considered mixed method research more as a methodology that encompasses several facets within the definition, extending from viewpoints to inferences. Thus, this study can be deemed as a mixed methods research as it combines both the quantitative and qualitative data analysis methods.

This study adopted a mixed methods research design and the rationale for adopting a mixed methods research design is it allows the researcher to fuse both quantitative and qualitative data analysis methods under one single study when analyzing qualitative data. The qualitative data was made up of four asynchronous online discussion transcripts. In other words, a single type of data could be studied twice using two different types data analysis methods. Quantitative data analysis method allows the researcher to obtain numerical values for both research question 1 and research question 2, where frequency and scores were concerned. This is due to the fact that one of the recognized advantages of quantitative data analysis is it can produce numerical values through counting and measurement (Y. Zhang & Wildemuth, 2009). Unlike quantitative data analysis method, qualitative data analysis method outcome was not numerical values. Instead, qualitative data analysis method is advantageous for those researchers who wish to discover patterns, themes and features from the data collected (Y. Zhang & Wildemuth, 2009). The outcome then can be explained, described and interpreted by researcher in order to put forward more complete insights regarding the phenomenon under study. As for research question 3, qualitative inductive research was adopted because the researcher aimed to uncover and describe the patterns of the use of conjunction in the context of the 4 online discussion transcripts collected and to explain how the use of grammatical cohesive devices reflects the critical thinking ratio. Therefore, by combining both data analysis methods, different insights will be yielded, which in turn making the outcome of the research a more rewarding one by enhancing the breadth and depth of understanding and corroboration of a study. This can be achieved because the information produced by quantitative and qualitative data analysis method can complement one another. In the following section, details regarding the participants and the setting of this study will be presented.

3.3 Participants and Setting

The asynchronous online discussion data was collected from one of the public universities located in Klang Valley. Participants of the asynchronous online discussion were the postgraduate students of the Faculty of Languages and Linguistics of that public university. The participants consist of two groups of postgraduate students who enrolled in two postgraduate courses. One group of the participants were the students from Research Methodology course while the other group consisted of participants who were the students from Second Language Acquisition course. Research Methodology course is one of the compulsory courses taken by all postgraduate students of the Faculty of Languages and Linguistics. It aims to introduce students to the basic principles of research methods so that the students will have acquired the knowledge in order to proceed with their research proposal design and writing. The teaching-learning methods adopted for this course are lectures, discussions and presentations. On the other hand, the Second Language Acquisition course is an elective course. It aims to introduce students to the principles underlying the acquisition of second language. The knowledge gained by students is meant to help them with their research in the future. Students of both second language acquisition and research methodology courses are required to critique article or book chapters and they also need to participate in online forum. Both activities are counted as part of the course assessment. The researcher asked for the permission to access the asynchronous online discussion data and use it for the purpose of this study from the lecturer teaching the two courses. Before that, the researcher had also verbally informed the participants that their threaded discussions transcripts would be collected and used as the data of this study. The participants also had been verbally informed about the aim of this study and they had been verbally given the assurance that their identity would not be disclosed in this study. The participants then had given the researcher the oral consent to proceed. According to Schneider (n.d),

when a qualitative study is going to be carried out in school, it may only require oral consent from the school head who can be the instructor of the course. It has to be pointed out that the threaded discussion activities designed for both Research Methodology and Second Language Acquisition courses had been carried out a semester before the researcher started this research.

3.4 Data Collection Procedure

The figure below shows the flow of data collection procedure of this study. The information of the data collection procedure is outlined after the flow chart.
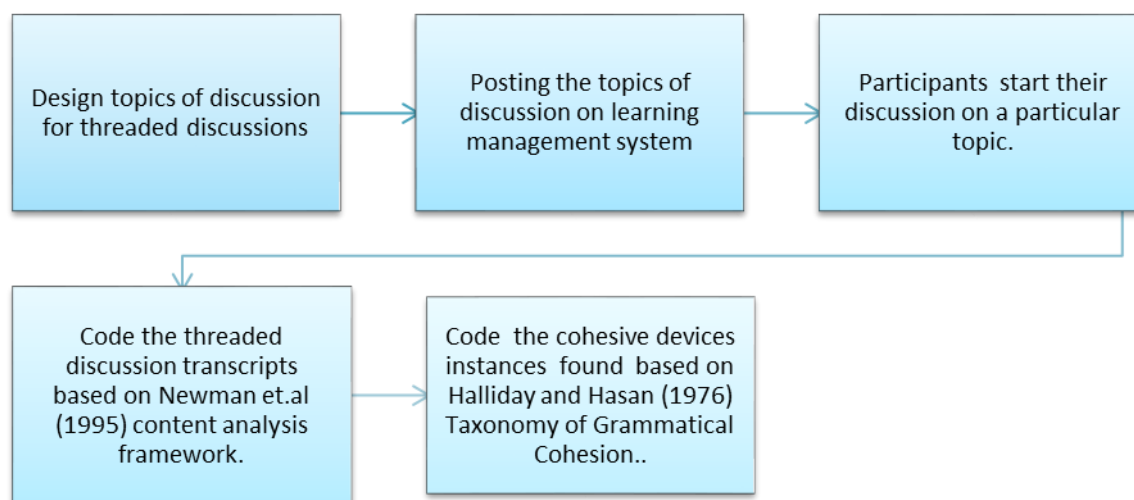
Figure 3.1: Flow chart of data collection procedure

The learning management system, which is based on the Moodle LMS platform, was used as the platform to launch threaded discussion which involved the postgraduate students who enrolled in Master courses. Four questions posted via threaded discussion were designed by the same lecturer who taught the two courses. The two courses were the Research Methodology course and Second Language Acquisition course. The questions were posted on Spectrum. Participants were required to post their personal comment at least once for each question and respond to their coursemates' response at

least twice. However, no limitation was set on the maximum number of responses one could post. The duration for each question to be discussed in the threaded discussion was about two weeks.

After all the online discussion sessions had ended, the online asynchronous transcripts were downloaded and imported into Nvivo 9, a computer data analysis software. The data were analysed based on two coding schemes. The first coding scheme was known as Newman et. al (1995) content analysis framework. This content analysis framework was used to assess the critical thinking found in each online transcript. The second coding scheme was derived from Halliday and Hasan (1976) taxonomy of grammatical cohesion. Halliday and Hasan (1976) classification of grammatical cohesion which includes the four cohesive devices, *i.e reference, substitution, ellipsis and conjunction* was adopted as the coding scheme in order to reveal the frequency of each type of cohesive devices found in each online transcript. The Halliday and Hasan (1976) taxonomy of grammatical cohesion and Newman et.al (1995) content analysis framework were shown in Chapter 3. Quantitative content analysis then was utilized to analyse the data using the software called Nvivo 9.Quantitative content analysis was used in parallel with the aim of meeting the research objectives stated in chapter 1 by finding the answers for research question 1 and 2 respectively. To answer research question 1, quantitative content analysis was used to find the frequency of each grammatical cohesive device used by participants in the four online discussion sessions. In addition, to answer research question 2, quantitative content analysis was adopted to obtain the score of critical thinking for each online discussion transcripts. Newman et.al. (1995) content analysis scheme allows critical thinking to be quantified into percentage and ratio units and this is also the first reason why the researcher of this study chose Newman et.al content analysis framework to analyse the online discussion transcripts. Being able to quantify critical thinking aids educators or researchers who wish to access

their students' critical thinking performance. This is because numerical values obtained could be used as learning evidence that can inform both the educators, researchers and students regarding critical thinking performance. The second reason why the researcher selected Newman et.al (1995) content analysis framework to assess critical thinking was Newman et.al (1995) content analysis framework provided an explicit list of positive and negative critical thinking indicators even though the list may not be exhaustive. On the other hand, in order to answer research question three which aims to discover how the use of cohesive devices reflects the participants' critical thinking ratio, qualitative inductive approach is adopted. Using the inductive approach, the researcher studied the concordance lines for the two most frequently used conjunctions for each category of conjunction as identified by Halliday and Hasan (1976) in order to identify the contexts of use of each conjunction in the data. Apart from studying the instances of conjunction, the researcher also studied the instances where pronoun 'I', ellipsis and substitution were found in order to see how the use of these four cohesive devices may reflect critical thinking.

After describing the data collection procedure, it is vital to outline in detail the information regarding the data collected to provide a more complete picture of this research. In the following section, the details regarding the samples of data collected will be presented.

3.4.1 Samples of Data Collected

Two topics of discussion were designed for each course, namely the Research Methodology course and Second Language Acquisition course. Thus, overall, a total of four topics of discussions which are relevant to the course content were designed before the commencement of the semester. The topics of discussion were formulated in line with the goal to fulfil the learning outcome of the courses. The participants from each

course need to discuss both topics. For each topic of discussion, participants were required to post at least once that shows their personal opinion and to post at least twice their comments on their peers' posting. Their participation in this asynchronous online discussion activity was compulsory. This is because it was assigned as part of assessment which contributed 10% to the overall final exam grade. The duration given to discuss each topic was two weeks. The four topics of online discussion were presented in the Appendix B. They were categorised according to each course.

In the above section, information regarding the samples of data collected for this study was outlined. In the following section, information pertaining to data analysis process will be described.

3.5 Data Analysis

In this section, general concept of content analysis will be presented. The information regarding the software used to analyse the data will also be outlined, followed by the description of the coding schemes adopted to analyse data.

3.5.1 Content Analysis

In order to answer the three research questions above, this study adopted content analysis which is a type of unobtrusive research method. As cited by Kim and Kuljis (2010), Krippendorff (1980) listed out several benefits of content analysis such as it is unobtrusive, it is unstructured, it is context sensitive and able to cope with a larger quantity of data and it examines the artifact (eg: text, images) of communication itself and not the individual directly. For this study, both quantitative content analysis and qualitative content analysis methods are used to analyze the data collected. In order to answer research question one and research question two, quantitative content analysis will be used. This is because both research questions concern about obtaining numerical

values. On the other hands, qualitative content analysis will be used to answer the third question. This is because qualitative content analysis allows the researchers to take subjective stance when they interpret the data. Qualitative content analysis also enables researchers to uncover underlying meaning from the data.

Content analysis is commonly used to study textual data (Priest, Roberts, & Woods, 2001).Textual data could be any printed materials such as text -based communication transcripts, books, magazines, newspaper articles and legal documents or any verbal speech and communication which have been transcribed into text based documents. Berelson (1952) defined content analysis as "a research technique for the objective, systematic, and quantitative description of manifest content of communication" (p. 18). When the context of computer conferencing is concerned, Kanuka and Anderson (1998) regarded content analysis as a "research methodology that uses a set of procedures to make valid inferences from text". Quantitative content analysis involves counting and measuring In order to yield numerical values. Text data is collected and coded into explicit categories. The result of data analysis is presented and described statistically.

Sometimes, content analysis is utilised as a way to analyse qualitative data quantitatively (Creswell, 2011). To date, content analysis is not only being used as quantitative data analysis method, but also used as qualitative data analysis method (Y. Zhang & Wildemuth, 2009). In fact, the potential of content analysis being used qualitatively has been noted in the earlier period of time. This is evident when Nandy and Sarvelain (1997) stated that qualitative content analysis method gains its popularity and recognition when it has begun to be widely adopted by health researchers in analysing their data.

Since this study used Nvivo 9 software to assist in data analysis, the following section will outline the information regarding this software. This includes the general

description of the features of Nvivo 9. Specific focus will be paid to the functions of those features used for this study. The features included nodes and query. There are many functions under the query feature. For the purpose of this study, the researcher used the matrix coding, text search, word frequency and coding comparison queries under the query feature.

3.5.2 Nvivo 9: Software Used to Carry Out Content Analysis

Nvivo9 is a computer assisted qualitative data analysis software and it enables both quantitative and qualitative content analysis to be carried out. The four online asynchronous discussion transcripts in word file format were imported to the software. Coding schemes were also set up using the Nodes function of the software. According to the definition given by Nvivo 9 online manual, a node is defined as "a collection of references about a specific theme, place, person or other area of interest." The references come from the content of data one coded at a particular node. The researcher of this study used the query feature provided by Nvivo 9 to analyse the data. The detailed elaboration of the use of NVivo 9 for this study will be found in Appendix C.

3.5.3 Halliday and Hasan Grammatical Cohesion Framework

For research question 1, Halliday and Hasan (1976) taxonomy of grammatical cohesion was used as the data analysis framework because it is claimed by many as the most comprehensive framework available to date to study cohesive devices (Xi, 2010). The taxonomy of grammatical cohesion created by Halliday and Hasan (1976) was adopted as the coding scheme. This study would focus on the four types of cohesive devices that make up grammatical cohesion. This is because grammatical cohesion is the interest of this study. The four types of cohesive devices are references, substitutions, ellipsis and conjunctions. Each type of cohesive devices is further subdivided into several categories. The full description of the four types of cohesive devices is available in Chapter 2. The

Halliday and Hasan Taxonomy of Grammatical Cohesion will be presented on the next page.

Reference		Substitution	Ellipsis	Conjunction
Personals		Nominal One/ones,the same	Nominal	Additive and, and also,nor,or,or else,furthermore, by the way,in other words,likewise,on the other hand,thus
Existential I,you,we,he.she,it, they,one	Possessive my/mine,your/yours, our/ours,his, her/hers,its, their/theirs,one's	Verbal do,be, have.,do the same,likewise,do so,be so,do it/that,be it/that	Verbal	Adversative yet,though, only,but,however,at least, in fact,rather, on the contrary,I mean,in any case
Demonstratives this/that, these/those,here/there		Clausal So, not	Clausal	Causal so, then, therefore, because,otherwise
Definite article the				Temporal then,next,before that,first...then...,at first,formerly, final,at once,soon, in conclusion,to sum up
Comparatives same,identical,similar(ly),such,different, other,else				

Table 3.1: Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion

Since the second research question concerned with the evaluation of critical thinking found in the data using Newman, Webb and Cochrane (1995) content analysis scheme, the following section presented the information regarding this content analysis scheme.

3.5.4 The Newman, Webb and Cochrane Content Analysis Framework (1995)

In order to answer research question 2, the Newman, Webb and Cochrane quantitative content analysis scheme (1995) was the instrument used by the researcher to analyse the data. This content analysis method was designed to assess the online group learning quality in terms of critical thinking characteristics it displays. Newman, Webb and Cochrane (1995) were concerned with tracing critical thinking in social context. They focused on evaluating critical thinking in computer supported collaborative learning context where a community of inquiry is established. The works from Garrison (1992) and Henri (1992) formed the foundation for the establishment of this content analysis framework. Garrison et.al (1992) had proposed a five- stage problem solving process. However, the five- stage of problem solving process was later separated into four phases and the phases were the ones illustrated in the Practical Inquiry Model. Garrison et.al (1992) claimed that participating in this kind of problem solving process is able to lead to the emergence of critical thinking. Henri (1992), on the other hand, identified five dimensions that could be used to evaluate computer supported collaborative learning. One of the dimensions she identified was known as the cognitive dimension. This cognitive dimension is concerned with the use of critical thinking skills by the participants in computer supported collaborative learning context. Newman, Webb and Cochrane (1995) regarded critical thinking as behaviours displayed by learners instead of treating it as stages that were experienced by the learners.

There are ten characteristics of critical thinking identified by Newman, Webb and Cochrane (1995). Each characteristic is divided into positive and negative indicators.

Positive indicators indicate the presence of the characteristics while negative indicators indicate the absence of the characteristics. The positive and negative indicators together make up the coding scheme of this content analysis method. The researchers then code the transcripts under the positive and negative indicators available. Newman et.al (1995) also provides the users with the mathematical formula that can be used to find out the critical thinking ratio for each characteristic of critical thinking. The mathematical formula is X+ -X-/X+ +X-. X+ refers to the total number of coded statements under positive indicator while X- refers to the total number of coded statements under negative indicator for a particular characteristic. For instance, according to the mathematical formula provided by Newman, Webb and Cochrane (1995), for the characteristic of Importance, if the 10 statements were coded under the Important statement (I+) indicator while 4 statements were coded under the Trivial, unimportant statement (I-) indicator, then the critical thinking for relevance category would be 10-4/10+4=3/7 or in decimal value which is 0.429. The detailed coding scheme of Newman, Webb and Cochrane (1995) is presented on the next page.

Table 1

Critical Thinking Indicators (from Newman et al., 1995)

	CATEGORY		POSITIVE INDICATOR		NEGATIVE INDICATOR
R	Relevance	R+	Relevant statements	R-	Irrelevant statements, diversions
I	Importance	I+	Important points, issues	I-	Unimportant, trivial points or issues
N	Novelty: new info, ideas, solutions	NP+	New problem-related information	NP-	Repeating what has been said
		NI+	New ideas for discussion	NI-	False or trivial leads
		NS+	New solutions to problem	NS-	Accepting first offered solution
		NQ+	Welcoming new ideas	NQ-	Squashing, putting down new ideas
		NL+	Learner brings new things in	NL-	Dragged in by tutor
O	Bringing outside knowl-edge or experi-ence to bear on problem	OE+	Drawing on personal experience	OQ-	Squashing attempts to bring in outside knowledge
		OC+	Refer to course material	O-	Sticking to prejudice or assumptions
		OM+	Use relevant outside material		
		OK+	Using previous knowledge		
		OP+	Course related problems brought in (e.g.; students identify problems from lecturers and texts)		
		OQ+	Welcoming outside knowledge		
A	Ambiguities: Clarified or confused	AC+	Clear, unambiguous statements	AC-	Confused statements
		A+	Clear up ambiguities	A-	Continue to ignore ambiguities
L	Linking ideas, interpretation	L+	Linking facts, ideas and notions	L-	Repeating information without making inferences or offering an interpretation
		L+	Generating new data from information collected	L-	Stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments
J	Justification	JP+	Providing proof or examples	JP-	Irrelevant or obscuring questions or examples
		JS+	Justifying solutions or judgments	JS-	Offering judgments or solutions without explanations or justifications
		JS+	Discussing advantages and disadvantages of solution	JS-	Offering several solutions without suggesting which is the most appropriate
C	Critical assess-ment	C+	Critical assessment or evaluation of own r others' contributions	C-	Uncritical acceptance or unreasoned rejection
		CT+	Tutor prompts for critical evaluation	CT-	Tutor uncritically accepts
P	Practical utility (grounding)	P+	Relate possible solutions to familiar situations	P-	Discuss in a vacuum
		P+	Discuss practical utility of new ideas	P-	Suggest impractical solutions
W	Width of understanding (complete picture)	W+	Widen discussion (problem within a larger perspective. Intervention strategies within a wider framework)	W-	Narrow discussion (address bits of fragments of situation. Suggest glib, partial interventions)

Table 3.2: Newman et.al (1995) Content Analysis Framework

Multiple codes can be applied to an instance if it shows the presence of more than one characteristics of critical thinking. Newman, Webb and Cochrane also recognized that this type of quantitative content analysis was a time consuming and laborious task due to the long-winded nature of content analysis process. In order to ease the job of coders, they stated that

> "Rather than classify every statement in a transcript as, e.g. critical assessment or uncritical acceptance, we mark and count the obvious examples, and ignore the intermediate shades of grey. This eases the task of the assessors, since there is less need for subtle, subjective, borderline judgements" (Newman, et al., 1995).

By adhering to their suggestion above, the coding process will be easier for the coders and it also may help the coders to obtain a satisfactory interrater reliability reading. This is because by taking into account only the obvious examples helps in reducing the disagreement among the coders when it comes to coding decision of the same content of the online transcripts based on Newman, Cochrane and Webb (1995) content analysis scheme.

Before coding the data, researchers first need to decide on the unit of analysis used. For Newman, Webb and Cochrane content analysis method, thematic unit is used (Garrison & Anderson, 2003). The use of thematic unit gives the researchers certain degree of flexibility when coding data. This is because instead of fixing the size of data coded, thematic unit allows researcher to code the data of any sizes, be it a single word, phrase, paragraph or the whole text as long as the portion of the text chosen as thematic unit expresses the meaning that agrees with the ideas of any of the categories of the coding scheme (Y. Zhang & Wildemuth, 2009). In the case where thematic unit is chosen as the unit of analysis, interrater reliability is low due to the prevalence of subjective rating

(Rourke, Anderson, Garrison, & Archer, 2000). In addition, Marra, Moore and Klimczak (2004) also noted that the diverse nature of unit of analysis which ranges from a single word, paragraph to entire posting renders the calculation of interrater reliability impossible. In fact, Newman, Webb and Cochrane (1995) did not report the reading of interrater reliability when they used their self-designed content analysis scheme to evaluate critical thinking found in their data. Therefore, for the purpose of this research, instead of using thematic unit as unit of analysis, sentence was chosen as the unit of analysis when the researcher and another independent coder coded the data based on Newman, Webb and Cochrane content analysis scheme (1995).

The fact that the sentence unit is easily identifiable is the reason why the researcher of this study chose sentence unit as the unit of analysis. In fact, there is no consensus achieved up to date regarding which unit of analysis is the most appropriate to be used for content analysis (De Wever, Van Keer, Schellens, & Valcke, 2007). This is evident when many researchers held different stand regarding which unit of analysis should be adopted. For instance, Gorsky et.al.(2012) did a research to study the possible impact of the choice of unit of analysis had on interrater reliability. They used Garrison et.al's (2000) community of inquiry model as their coding scheme to code the online forum transcripts quantitatively. Gorsky et.al.(2012) discovered that although both sentence and message unit yielded high interrater reliability reading, the use of sentence unit yielded higher interrater reliability compared to when message unit was used. According to Cook & Ralston (2003), altering of the size of this unit was likely to influence coding decisions and comparability of outcome between different models. Thus, no matter what choice has been made by the researchers regarding which type of unit of analysis to be used, they apparently have to ponder well when they choose what they deemed as the unit of analysis. In order to attain higher interrater reliability, the researcher of this study decided to use sentence unit as the unit of analysis.

The previous section outlined both the information about the use of Newman, Webb and Cochrane (1995) content analysis scheme and also the brief summary regarding the issue revolved around the choice of a unit of analysis. The following section will present the information about interrater reliability.

3.5.5 Interrater Reliability

Obtaining the reading of interrater reliability is widely recognised as an essential step to be carried out by content analysts. The importance of obtaining interrater reliability is reflected when Neuendorf (2002) wrote, "given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of reliability, content analysis measures are useless (p.141). ''According to Lombard, Synder-Duch and Bracken (2010), interrater reliability is defined as, "the extent to which independent coders evaluate a characteristic of a message or artifact and reach the same conclusion**."** For this study, there were two coders coding the data independently using the same coding scheme established by Newman, Webb and Cochrane (1995). The first coder was the researcher herself, and the second coder was a fellow coursemate who had background knowledge regarding the two subjects taught because some of the indicators are subject knowledge related. In other words, it would be appropriate to look for a coder who has knowledge regarding the subject matter under discussion to code the selected data, so that the coder can assess the data more reliably based on Newman, Webb and Cochrane (1995) coding scheme. One way to make sure the coder has the subject matter knowledge was by selecting the coder from those students who have enrolled in both courses before. For the purpose of achieving interrater reliability reading, both the researcher and the second coder coded about 20% of the overall data**.** The online discussion transcript of the second online discussion topic for Second Language Acquisition course was selected for this purpose. This is because the second

coder worked on voluntary basis and it would be unreasonable to expect her to code all the data which would be too time-consuming. The researcher held meetings with the second coder for several times in order to explain the Newman et.al content analysis coding scheme to her and also to discuss the results of the codings produced by both researcher and the second coder. During the discussion, the researcher and the second coder discussed the disagreement in assigning codes to the sentential units found in the data. The interrater reliability for this study is reported under both the Kappa Coefficient indice and Percentage of agreement indice.

The merged data then was run using Coding Comparison Query feature found in Nvivo 9 in order to obtain the values of both the Kappa Coefficient indice and percentage of agreement for each separate node were obtained. The total number of nodes is 31.

The result produced by Coding Comparison Query was then exported to Microsoft Excel 2010. There, the researcher then looked for the average reading for both Kappa Coefficient indice and percentage of agreement by dividing the total sum of the values of both the Kappa Coefficient indice and percentage of agreement with the total number of nodes. For this study, it was found that the Kappa Coefficient value gained was 0.72 while the percentage of agreement gained was 94.66% (Refer to Appendix D, Table D (I)).

According to the information obtained from table presented in Viera and Garrett's paper published in 2005 regarding the interpretation of Kappa Coefficient values, 0.72 could be interpreted as the substantial agreement achieved between the two coders. The table adopted from Viera and Garrett's (2005) paper is shown as Table 3.3 on the next page.

Kappa	Agreement
<0	Less than chance agreement
0.01-0.20	Slight agreement
0.21-0.40	Fair agreement
0.41-0.60	Moderate agreement
0.61-0.80	Substantial agreement
0.81-0.99	Almost perfect agreement

Table 3.3: Interpretation of Kappa Coefficient values adapted from Viera and Garret (2005)

As aforementioned, the value of percentage of agreement indice gained was 94.68%. The value is deemed acceptable and could be interpreted as an almost perfect agreement achieved between both coders as it was deemed as quite high.

The rationale for the researcher to present the values of the two kinds of interrater reliability indices was because as stated by a number of researchers, interpreting value of percentage of agreement solely is likely to mislead the researchers with regard to the true extent of interrater agreement (Lombard, et al., 2010). In other words, the value of percentage of agreement indice apparently fails to show the real extent of interrater agreement. Therefore, researchers such as Lombard (2010) advised researchers to report not only percentage of agreement value, but also complement it with other interrater reliability indices as well in order to obtain the true extent of the interrater agreement. Therefore, for this study, the researcher reported the value of percentage of agreement indice along with the value of Kappa Coefficient indice.

After dealing with the aspect of quantitative content analysis that was adopted to answer both research question one and two, the next section will present the information regarding qualitative content analysis that was used to answer research three.

3.5.6 Qualitatative Content Analysis

In order to answer research question 3, firstly, Word frequency query function of Nvivo 9 was used to find out the most frequently used reference item. It was then discovered that the pronoun 'I had the highest frequency of use. In terms of pronoun 'I' in this study, there were altogether 375 instances found. Word frequency query was also used to the two most frequently used conjunction for each category of conjunction as identified by Halliday and Hasan (1976) in the overall data. In terms of pronoun 'I' in this study, there were altogether 375 instances found. As for the conjunction, there were altogether 8 conjunctions to be studied in total.

Secondly, the Wordtree function provides concordance lines where conjunction, substitution, pronoun 'I' and ellipsis were found, for instance, referring to Appendix C(II) (Figure C(4)) where Wordtree function of NVivo 9 is found, the word 'therefore' belongs to the conjunctive adverbials group and the branches originate from the word 'therefore' represent the concordance lines. Using the inductive approach, the researcher studied the concordance lines for the instances of the cohesive devices mentioned above in order to identify the contexts where they had likely been used and link that to how they might reflect critical thinking.

This chapter outlined the information regarding the methodology adopted by the researcher for this study. This chapter gave the full account of research design, participants and setting, data collection procedure and data analysis. The next chapter will present the results and discussion for this study. The result for each research question will be presented, together with the discussion of the results.

CHAPTER 4: FINDINGS AND DISCUSSION IN RELATION TO THE READING OF CRITICAL THINKING INDICATORS

4.1 Introduction

In the preceding chapter, the research design used in this study was delineated in details. This included the qualitative data collection involving four sets of asynchronous online discussion transcripts, and the quantitative and qualitative data analysis method used to yield results for this study. In this chapter, the results and discussion of the study will be presented. The results and discussion will be presented separately in accordance with the research questions.

The first section of this chapter will present the results of the frequency of cohesive devices found in the data using the Matrix coding function of Nvivo 9, which will answer the first research question: What is the frequency of the cohesive devices used by the participants in the threaded discussion? The next section will address the second research question: What is the critical thinking ratio attained by each threaded discussion based on Newman, Webb & Cochrane's (1995) content analysis scheme? In order to answer this research question, the researcher will present the results of critical thinking ratio gained after the data was assessed based on Newman et.al. (1995) content analysis scheme. The third research question: How does the use of cohesive devices reflect the participants' critical thinking ratio? will be addressed in the next chapter. The following section will present the findings and discussion of the frequency of cohesive devices found in the data.

4.2 Findings and Discussion of Research Question One

Research Question 1:

What is the frequency of the cohesive devices used by the participants in the

threaded discussions?

In order to answer the first research question : What is the frequency of the cohesive devices used by the participants in the threaded discussion, the frequency of each type of cohesive devices was calculated and presented in terms of percentage. Halliday and Hasan (1976) classified these cohesive devices into four types, namely, reference, substitution, ellipsis and conjunction. Each type of cohesive devices was further broken down into sub categories.

For the purpose of this study, intersentence and intrasentence cohesion instances were both taken into account although Halliday and Hasan (1976) maintained that intersentence cohesion were more significant than intrasentence cohesion instances. In term of the frequency of the use of cohesive devices, reference scores the highest percentage of use 54.41%, followed by conjunction 45.09%, substitution 0.32% and ellipsis 0.18%. The result is presented in Table 4.1 below:

Types of cohesive devices	Percentage of use
Reference	54.41%
Conjunction	45.09%
Substitution	0.32%
Ellipsis	0.18%

Table 4.1: Percentage of Use of Each Type of Cohesive Devices

Where the frequency of the use of cohesive devices is concerned, this result resembles the findings of the study by Yoon-Hee (2011). Yoon-Hee (2011) found that reference

scored the highest percentage of use, followed by conjunction, lexical cohesion, ellipsis and substitution. Yoon-Hee's (2011) findings were similar to the result of this study. Based on the similar trend found by both researchers in terms of the frequency of each cohesive tie found in asynchronous CMC texts, this, hence, suggested that reference and conjunction were likely to be the dominant features found in asynchronous CMC texts as compared to substitution and ellipsis.

The reason stated by Yoon-Hee (2011) in regards to why ellipsis and substitution were both not frequently found in the CMC texts was that those features were found most frequently in spoken discourse rather than written discourse. This implied that asynchronous mode of CMC displays the tendency of the use of more written-like language rather that spoken -like language. This claim is further supported when Lapadat (2002) who stated that the writing found in asynchronous conferences were more formal than synchronous conference which displays more spoken like language. One of the reasons cited by her was that participants of asynchronous conferences normally would have ample time to think before they replied to others' postings, rendering their writing to be more carefully crafted, content-laden, lexical dense, coherent and complete. The other possible reason why substitution and ellipsis were not frequently found in CMC may relate to the fact that students overall perceived that they should write as formally as possible in asynchronous online discussion because they would be assessed eventually by the instructors, rendering the asynchronous online discussion to resemble the written discourse.

In another study, Al Jarf (2001) who conducted a study to investigate the difficulty the participants faced in processing the four types cohesive devices, namely, the conjunction, ellipsis, substitution and reference, found that processing substitution was the hardest task for her subjects of the study in terms of identifying the correct words and phrases for each substitute, followed by processing reference and ellipsis, while

processing conjunction was the easiest task to complete as the subjects were able to identify 70% of the conjunctions. In terms of the difficulty level of each cohesive tie, the researcher found that substitution is the most difficult cohesive device, followed by ellipsis, reference and conjunction. The result of this study also showed that substitution and ellipsis were rarely used by the participants in threaded discussion.

Chawwang (2008) also conducted a study to investigate the reading problems related to sentence structure, vocabulary and reading comprehension faced by Thai 12th grade students when reading English texts. One of the findings reported by Chawwang (2008) was that sentence structures that were made up of substitution and elliptical expressions were recognised as difficult structures for students. Chawwang (2008) further stated that elliptical expressions was perceived as difficult by the participants as elliptical expressions involve omission of information that often leads to unclear meaning and reading problem. Another researcher, Taboada (2000) investigated the cohesion found in spoken discourse and revealed that ellipsis and substitution were not preferred by the speakers. She then presumed that this was because ellipsis and substitution both required the speakers to go the extra mile to resolve the elliptical and substitution reference, thus placing heavy burden on speakers' mind. Similar to the findings by Chawwang (2008) and Tabaoda (2000), substitution and ellipsis were not preferred by the participants of this study.

All these studies have shed lights on why ellipsis and substitution features were the least found in the data of this study as the learners found them hard to be comprehended. Therefore, summarizing from the information gathered from the studies above, there are three reasons that may lead to the least use of both substitution and ellipsis by the participants of this study. Firstly, it could be due to the fact that the participants realized that although the use of ellipsis can be more economical in terms of time and space, they have to use it effectively in order not to create confusion for the readers. Secondly,

this could be also due to the fact that the participants realized that the use of ellipsis and substitution may hamper the reading comprehension process of the readers as the readers need to do extra work to retrieve the information from the context of the text in order to understand the elliptical and substituted parts. Thirdly, the participants may not have mastered the two structures themselves. This may cause them to avoid using these two structures in order to minimize errors. Even though they are aware of these two structures, they may choose not to use it simply because they seldom use or encounter these two structures in their daily life. Last but not least, substitution and ellipsis were not frequently used by the participants of this study because the participants viewed threaded discussion as a kind of formal writing, a discourse where substitution and ellipsis were least used.

As cited by Yoon-Hee's (2011), Biesenbach-Lucas (1994) and Kang (2005) who reported that referential cohesion which refers anaphorically to the preceding referent was more frequently found in spoken discourse than in written discourse and it was also more frequently used in L2 writing. Yoon-Hee's (2011) justified the high frequency of the use of reference in her data by stating that, since CMC has been considered by some as displaying both features of written and spoken discourse, the high frequency of the use of reference which is the feature of spoken discourse, thus, was expected to be found in CMC texts.

The findings of this study indicate that conjunction scored the second highest percentage of use which may due to the nature of the task set by the course instructor. For instance, all the participants of asynchronous online discussion of this study were required to discuss, give their opinions and respond to their peers' postings regarding each topic under discussion. Thus, they were expected to be involved in argumentation to a certain degree. Alacon and Morales (2011) reported that conjunction was the second most frequently used cohesive devices in argumentative essays after references.

Their findings indicated that conjunction apparently is an important cohesive device one uses to form argument. The function of conjunction as a source to produce coherent argument may cause the participants of this study to use it frequently to establish their own arguments in online discussion. This may explain why the frequency of conjunction found in the data of this study was high.

In the next section, the detailed findings and discussion of the findings regarding the cohesive devices will be presented separately in accordance with the types of cohesive devices, namely the reference, conjunction, substitution and ellipsis. The findings will include the frequency presented in percentage unit for each specific sub category subsumed under each cohesive tie which will then be followed by the presentation of the findings.

4.2.1 Reference

According to Halliday and Hasan's Taxonomy of Grammatical Cohesion (1976), the reference cohesive device was further divided into three sub categories namely the personal reference, the demonstrative reference and comparative reference.   The percentage of use for each of the categories found in the data is presented in Table 4.2 below.

Types of reference	Percentage of use
Personal reference	61.18%
Demonstrative reference	21.27%
Comparative reference	17.55%

Table 4.2: Percentage of Use of Each Sub Category of Reference Cohesive Device

According to the result displayed in Table 4.2, it is apparent that personal reference was the most frequently used reference type by the participants in asynchronous online discussion, followed by the use of the demonstrative reference. The least used reference type is the comparative reference. The percentage of use for personal reference is

61.81%, followed by demonstrative reference 21.27% and comparative reference 17.55%.

For this study, only the instances of endophoric reference were taken into account because endophoric reference is the one which contribute to cohesion. In the next section, the details regarding the personal reference found in the data will be presented.

4.2.1.1 Personal Reference

Personal reference is realized through the use of personal pronouns (I, you, we, they, he, she, it), possessive adjectives (my, its, your, his, her, our, their) and possessive pronouns (mine, yours, his, hers, its, ours, yours, theirs). Based on Halliday and Hasan (1976, p.51), the first personal and second personal pronouns (I, we, you) are recognized as speech roles. Third personal pronouns (he, she, it, they) will typically refer anaphorically to the referents. Therefore, the instances of third personal pronouns will be considered as functioning endophorically and thus contribute to cohesion. The pronoun 'I' means the speaker or writer, 'you' the 'addressee' or 'reader' and 'we' either means ' I and you' or "I with or without you plus other people.' Extractions from the data which depict the instances of third personal reference are shown below:

The use of 'third personal pronouns'

The use of 'it' and 'its'

Example 4.2.1.1.1 (Extracted from the RM 2 threaded discussion transcript):

*If the question is not needed, then **it** should not be asked in the first place to avoid time waste.*

Example 4.2.1.1.2 (Extracted from the RM 1 threaded discussion transcript):

*Without the presence of literature review, the research will lose **its** significance.*

The use of 'he' and 'she'

Example 4.2.1.1.3 (Extracted from the SLA 1 threaded discussion transcript):

*For example, if a learner is personally interested in the learning, **he or she** would try to strive for a certain targeted achievement even though it might seem difficult.*

The use of 'his', 'him' and 'her'

Example 4.2.1.1.4 (Extracted from the RM 2 threaded discussion transcript):

*Sometimes when the intervieweegets stuck, we could perhaps assist **him or her** by asking questions that would help **him or her** to express **his or her** intended meanings.*

The use of 'they', 'them' and 'their'

Example 4.2.1.1.5 (Extracted from the SLA 1 threaded discussion transcript):

*Children don't or might not know the term motivation and self- confidence and its meaning. However, **they** display it in their daily life through behavior and attitude.*

Example 4.2.1.1.6(Extracted from the SLA 2 threaded discussion transcript):

*But then it is a doubt that this can work because the students' family and the society around **them** seem to use **their** mother tongue in the communication between **them**.*

All the examples above show the use of third personal pronouns in anaphorical manner. The anaphoric references which were made up of the third personal pronouns required the addressee or readers to refer to the preceding textual information in order for them to retrieve the idea or objects each of the personal pronouns refers to. For instance, example 4.2.1.1.1 shows the use of third personal pronouns 'it'. The personal pronoun 'it' in example 1 functioned as anaphorical reference. In this case, the referent for the personal pronoun 'it' was 'the question'. The readers or addressees had to refer

backwards or anaphorically to the preceding information which lies within the sentence itself to retrieve the object referred to by the pronoun 'it'. The object here was 'the question'. In example 4.2.1.1.6, there were several instances of personal reference. The possessive pronoun 'their' and the object pronoun 'them' were both used in example 6. The first occurrence of the object pronoun 'them' referred anaphorically or backwards to 'the students' while the second occurrence of the object pronoun 'them' referred anaphorically or backwards to 'the students, the students' family and also the society.' The possessive pronoun 'their' referred to 'the students, the students' family and also the society.'

Although endophoric reference can be either anaphoric (referring backwards) or cataphoric (referring forwards), there is no cataphoric reference instance found in the data of this study in terms of the use of third personal pronouns and their inflected forms as personal reference. This finding is somehow expected, as, according to Halliday and Hasan (1976, p. 57), most of the occurrences of third person forms are anaphoric although there are in fact instances where third person forms are cataphoric. Halliday and Hasan (1976, p.56) further stated, however, that even if these instances are cataphoric reference, they do not contribute to textual cohesion because cataphoric reference is structurally determined. In other words, the instances of cataphoric reference of third person forms were produced through structural relations and this goes against the concept of cohesion proposed by Halliday and Hasan (1976) which stated that cohesion is about the use of non -structural text forming relations to make a text cohesive. The other reason why there is no instance of third personal forms being used as cataphoric reference is it is not the typical mode of language for the participants to use in their daily transaction. Also, they may not even realize that the third personal forms could be used in cataphorical manner.

After discussing the result on personal reference, the following section will describe the demonstrative reference which was also detected frequently in the data (Refer to Table 4.2).

4.2.1.2 Demonstrative Reference

The percentage of use of demonstrative reference ranks the second highest after personal reference. The instances of endophoric demonstrative reference extracted from the data are presented below:

The use of 'Demonstrative References'

The use of 'this'

Example 4.2.1.2.1 (Extracted from the RM 2 threaded discussion transcript) :

*Be careful of asking "why" question. **This** type of question infers a cause-effect relationship that may not truly exist.*

The demonstrative 'this' in example 4.2.1.2.1 above functioned anaphorically. It referred to the antecedent appeared in preceding sentence which was the "why" question.

Example 4.2.1.2.2 (Extracted from the SLA 1 threaded discussion transcript):

*I found **this** in Reader's Digest, September 2007:*

Exam Stress

Thank you Mr Jim Plouffe for your note on tackling exam nightmares ("Letter From the Editor," June 2007). I blame parents and teachers for the pressure that students experience, especially in the exam hall. I failed mathematics when I was in Year 8, even though I had excelled in it. I was so tense and nervous that I could not answer any of

the questions properly. I made many silly mistakes. There are many students who go through the same anxiety. By Rayna Awal, Bangladesh.

The determiner 'this' used in example 4.2.1.2.2 above functioned cataphorically. "This" referred cataphorically or forward to the content of letter with the title Exam Stress found in Reader's Digest by the participant of threaded discussion.

The use of 'these'

Example 4.2.1.2.3 (Extracted from the SLA 2 threaded discussion transcript):

*There are no certain rules which state that accuracy is more vital than fluency and vice versa. But then of course, to keep **these** in balance would be the major challenge for both teachers and students.*

The demonstrative "these" used in example 4.2.1.2.3 above functioned anaphorically. It referred to the antecedents appeared in preceding sentence which are accuracy and fluency.

The use of 'that'

Example 4.2.1.2.4 (Extracted from the SLA 2 threaded discussion transcript)

*The language after all, would be of very limited use without the learners actually practice speaking it. **That** is why the current trend in language learning is more towards Communicative Language Teaching (CLT) in which the children are encouraged to engage in socially-mediated activities by using their speaking skills.*

The demonstrative "That" used in example 4.2.1.2.4 above functioned anaphorically. It referred to the whole content of the preceding sentence.

The use of 'those'

Example 4.2.1.2.5(Extracted from the SLA 2threaded discussion transcript)

*They give priority to grammar. As if they are super sensitive to any, even small grammatical mistakes and **those** mistakes are not tolerated.*

The demonstrative 'those' used in example 4.2.1.2.5 above functioned anaphorically. It referred to the portion of the same sentence which is any, even small grammatical mistakes that preceded 'those'.

The use of 'there'

Example 4.2.1.2.6 (Extracted from the SLA 1 threaded discussion transcript)

*Yes, Irwan, you are right. Forgive me if I have overlooked the term acquisition **there**.*

The demonstrative 'there' used in example 4.2.1.2.6 above functioned anaphorically. Its referent was the location where the term acquisition can be found in the virtual space of threaded discussion. The term 'acquisition' appeared in the topic of discussion which was posted as the heading of the particular session of threaded discussion.

Overall, judging from the examples above, the demonstratives "this", "these", "that" and "those" functioned anaphorically. There was only one instance of 'this' being detected as functioning cataphorically. The demonstrative 'this', 'these' 'that' and 'those' used by the participants anaphorically, instead of cataphorically, may be due to the tendencies of participants in using demonstrative reference anaphorically in their daily life. Both personal and demonstrative reference found in the data shared one common characteristic which is they were found to be used mostly anaphorically instead of cataphorically. This can be explained using Chafe's Activation Cost Theory**.** Based on Chafe's Activation Cost Theory, as cited in Gao (2012), that the paucity of cataphora found in his research data was because the interpretation of cataphora demanded higher cognitive cost. In other words, in order for the readers to be able to

compute the instances of cataphora, more cognitive effort from the readers is needed. In the next section, the instances of the comparative reference that were the least to be found in the data will be discussed (Refer to Table 4.2).

4.2.1.3 Comparative reference

Comparative reference is the least used reference type to establish cohesion in the data. It marked the lowest percentage of use among the three types of reference. The comparative reference was sub divided into two categories. One of the categories is known as general comparison and the other particular comparison (Halliday and Hasan, 1976, p.76). Following the categorization of Halliday and Hasan (1976, p, 76), the instances of comparative reference extracted from the data were divided into the two categories and were presented as below. The instances of the use of particular comparison are first presented below, followed by the instances of the use of general comparison.

The examples of the use of particular comparison

Example 4.2.1.3.1 (Extracted from the SLA 1 threaded discussion transcript)

*Undoubtedly, I strongly believe that psychological aspect has an impact to ones' learning. In reference to Krashen's affective filter hypothesis, I supposed that a learner who has a **higher** motivation and self confidence tends to absorb and comprehend **better** compared to those who have low self motivation and self confidence.*

In example 4.2.1.3.1 above, the comparative adjectives 'higher' was used to compare the degree of motivation among the different types of learners. The adverb 'better' found in the sentence was also a source of comparative reference in which it functioned to compare the ability of two types of learners, i.e one type with higher motivation and self –confidence and the type with low motivation and self-confidence in absorbing and

comprehending the input. Here, the comparative adjective 'higher' was cataphoric to those learners who had low motivation and self –motivation. In addition, the adverb 'better' was also cataphoric to the ability of those learners who had low motivation and self-confidence in absorbing and comprehending the input.

Example 4.2.1.3.2 (Extracted from the SLA 2 threaded discussion transcript):

*For example, if the instructors got to correct speech in the case of young learners may create a negative attitude towards learning and may diminish a child's interest in learning. I feel that fluency **is more important than** accuracy as to this case.*

The comparative adjective 'more important' in example 4.2.1.3.2 above was used cataphorically to accuracy to compare the importance of attaining fluency and accuracy in second language acquisition context.

Example 4.2.1.3.3 (Extracted from the SLA 1 threaded discussion transcript):

*The ability to think on our feet requires more than just the normal motivation and confidence we normally ascribe to, as those tasks are comparatively **less daunting** than the oral tasks.*

The adverb' less' +adjective 'daunting' in example 4.2.1.3.3 was used to compare which type of tasks is more intimidating. The tasks being compared here were those tasks and oral tasks. The adverb 'less' +adjective 'daunting' was cataphoric to the oral tasks.

Example 4.2.1.3 4 (Extracted from the SLA 2 threaded discussion transcript):

*But being children too, they are not **as afraid as** adult to make mistakes.*

In example 4.2.1.3.4 above, the use of 'are not' +'as+afraid+as' showed the difference in degree of fear experienced by children and adults regarding making mistakes. The 'are not' +'as+afraid+as' was cataphoric to the adult.

Extracted from the data collected, the four examples above illustrate the use of the particular comparison. Next, the examples of the use of general comparison extracted from the data will be presented below.

The example of the use of General Comparison

Example 4.2.1.3.5 (Extracted from the RM 1 threaded discussion transcript):

*By including our opinions or comments of other related research work, we are actually providing a **different perspective** into other people's research.*

The use of 'different' in example 4.2.1.3.5 was to show the difference in perspectives by comparing the perspectives given by the participants of this study with other researchers' perspectives regarding their work. The use of first personal plural pronoun 'our' and 'we' represented the online community of this session of asynchronous online discussion which consisted of the participants of this study.

Example 4.2.1.3.6 (Extracted from the RM 2 threaded discussion transcript):

*It is very important to know why the interviewee is **thinking differently** compared to others because there might be other reasons that influence his/her opinion.*

In example 4.2.1.3.6 above, the adverb 'differently' was used to state the differences in thinking by comparing the thinking of interviewee with other people.

Example 4.2.1.3.7 (Extracted from the SLA 1 threaded discussion transcript):

*Learners are surrounded with circle of friends with **similar** interests- extrinsic motivation.*

In example 4.2.1.3.7 above, the adjective 'similar' was used to show the similarity in interests between learners and the circle of learner's friends.

Example 4.2.1.3.8 (Extracted from the RM 1 threaded discussion transcript):

*Literature review is an attempt of researcher to connect his/her text with the canonized text/author **in the same field of knowledge.***

In example 4.2.1.3.8 above, the use of the adjective 'same' was to show the similarity in terms of field of knowledge between the researcher and canonized text/ author.

Example 4.2.1.3.9 (Extracted from the RM 1 threaded discussion transcript):

*As regards to the music analogy, I guess Luciano Pavarotti made his mark with his tenor voice. **Likewise**, a reviewer has to make a significant mark in lending his or her voice into a literature review.*

In example 4.2.1.3.9 above, 'likewise' was used to show that a reviewer has to do the similar thing as Luciano Pavarotti does to his music by producing significant mark in their work. In return, the reviewer was able to leave significant impression to those who had read his literature review. The adverb "Likewise" was anaphoric to the music analogy where Luciano Pavarotti was the example being drawn on.

Most of the instances of comparative reference found in the data together with the ones being extracted and presented as examples above are cataphoric in nature. This could be due to the tendency of the participants to use specific sentence structures when comparing two entities. The next section will deal with the instances of pronouns 'I', 'you' and 'we' which are found in the data.

4.2.1.4 The use of 'I', 'you' and 'we'

The personal pronouns *'I', 'you' and 'we'* were the three most frequently pronouns used by the participants in threaded discussion. In fact, the first personal pronoun 'I' was the most frequently used pronoun found in the data, followed by 'we' and 'you'. The high occurrences of these three pronouns *"I", "you" and "we"* in the data should be taken into account as the use of these three pronouns may cause the threaded discussion to have a unique register of its own. This is because apart from resembling written discourse, threaded discussion was claimed to also resemble spoken discourse due to the frequent use of these three pronouns *"I", "you" and "we"* (Baron, 2010). Drawing from the data, it seems that the use of 'I' was likely to occur side by side with mental verbs like "I think' and "I believe". Hence, it can be said that the use of "I" by the participants served the purpose to introduce the identity of the participants and to put forward one's opinions and to present one's stand (example: I agree). This increased the subjectivity of the information given and this was also likely to increase the level of responsibility held by one towards the opinions or information one provided. The three examples of the use of the pronoun 'I' are shown below:

Examples of the use of 'I'

Example 4.2.1.4.1:

*If speaking or oral skills are to be taken into account, **I believe** that a person who has a high self- confidence and participates a lot in class would have the tendency to improve more.*

Example 4.2.1.4.2:

***I think** the most important point to note before analysing both the situation is : What is the Research Question that the interviewer is aiming to answer?*

Example 4.2.1.4.3:

***I agree** with Gomathi simply because questions will help the interviewee to extend further in his/her answers.*

One of the purposes of using pronoun 'we' by the participants in threaded discussion was to signal the assumption made by the written with respect to the existence of shared experience and opinions   between the writer and other participants of the threaded discussion towards the matters under discussion. The personal pronouns 'we' and 'you' were considered as reader pronouns (Hyland, 2005a:54). The three examples of the use of the pronoun 'we' are shown below:

Examples of the use of 'we'

Example 4.2.1.4.4:

*Besides that, literature review also serves as a proof that someone has done something on a particular topic and this is the result that he/ she obtained and **we** are acknowledging their contributions.*

Example 4.2.1.4.5:

*Most probably this happens because, when we write **we** actually have time to think, whereas in speaking these foreign languages, we have to do it spontaneously.*

Example 4.2.1.4.6:

*You have got interesting point there, Huzaifah. As the never-ending argument entails, is it accuracy or fluency **we** are striving upon?*

Last but not least is the use of second singular personal pronoun 'you'. The second personal pronoun 'You' was used to address the specific participant or other participants in general in order to draw their attention towards the issues under

discussion. As cited by Rasti (2011), Kitagawa and Lehrer (1990) claimed that the impersonal use of 'you' brought with it the general referent to people at large, without acting as specific reference. Kitagawa and Lehrer's (1990) claim of impersonal use of 'you' was further supported by Quirk and Greenbaum (1990) where they stated that the personal pronoun 'you' can act as generic reference. The three examples of the use of the pronoun 'you' are shown below:

Examples of the use of 'you'

Example 4.2.1.4.7:

You *have a point there, Frahana.*

Example 4.2.1.4.8:

*Knowing that **you** are not good at something, would propel **you** to put in more effort into it.*

Example 4.2.1.4.9:

*The purpose of a writing a literature review will display to the readers what **you** have read and whether or not **you** take a nice grasp of the major published work with reference to a particular topic in your research area.*

In sum, the instances of there are three types of references, namely the personal reference, demonstrative reference and comparative reference were identified and extracted from the data collected for this study. In the next section, the information regarding the frequency and instances of each sub type of conjunction will be presented.

4.2.2 Conjunction

Conjunction was the second most frequently used cohesive device found in the data collected. (Refer to Table 4.1). According to Halliday and Hasan's Taxonomy of Grammatical Cohesion (1976), the conjunction cohesive device was further divided into four sub categories namely the additive, adversative, causal and temporal. The percentage of use for each of the categories found in the data is presented in Table 4.3 below.

Types of Conjunction	Percentage
Additive	27.08%
Adversative	30.63%
Causal	33.54%
Temporal	8.75%

Table 4.3: Percentage of Use for Each Sub Category of Conjunction Cohesive Device

Overall, there were 480 instances of conjunction being identified by the researcher after studying the data based on the conjunction list provided by Halliday and Hasan (1976, p.242,243). Only the conjunctive instances of 'and 'and 'or' were counted. The coordinate instances of 'and' and 'or' were not counted as the coordinate instances of 'and' and 'or' did not contribute to cohesion of a text (Halliday & Hasan, 1976, p. 233) Based on the result displayed in Table 4.3, it is apparent that the causal type of conjunction was the most frequently used conjunction type by the participants in asynchronous online discussion, followed by the use of the adversative type of conjunction and the additive type of conjunction. The least used conjunction type is the temporal type of conjunction. The percentage of use for the causal type of conjunction is 33.54%, followed by the adversative type of conjunction 30.63%, the additive type of conjunction 27.08% and the temporal type of conjunction 8.75%. As aforementioned,

the widely used of conjunction by the subjects of this study was expected because the asynchronous online discussion tasks engaged the subjects in argumentative mode and conjunction is an indispensable source to be used to establish logical and sound arguments. This has led the researcher to compare and contrast the results of this study with those genre analysis studies that were relevant to argumentative genre.

For instance, by comparing the corpus of Thai learners argumentative essays with the corpus of US students' argumentative essays, Patanasorn (2010) found that the top five most frequently used linking adverbials used by Thai learners are the conjunction 'so', 'moreover', 'for example', 'however' and 'therefore' while the top five most frequently used linking adverbials by their US counterpart were the conjunction 'also', 'so', 'however', 'then' and 'therefore'. This study conducted by Tangpoon-Patanasorn (2010) also revealed that Thai learners' and US students' corpus of argumentative essays shared a similar pattern when the frequency of the use of each type of linking adverbials is concerned, that is, the percentage of use of the result/inference linking adverbials is the highest, followed by enumeration/addition/summation linking adverbials and contrast/concession linking adverbials. The linking adverbials that were least found in two sets of corpus were apposition and transition types of linking adverbials.

Although Tangpoon-Patanasorn (2010) focused on linking adverbials solely and for this study, the researcher focused on conjunction at large, the Halliday and Hasan (1976) classification of conjunctions framework has included within it the linking adverbials besides the coordinating conjunctions. Thus, referring back to the eight most frequently found conjunctions in the data collected and if the two coordinating conjunction "and ", 'but" and subordinating conjunction "because" were not taken into account, "also", "however", "so", "therefore" and "thus" became the five most frequently used conjunctions. The conjunction items such as "also", "however", "so", "therefore" and "thus" were known as linking adverbials according to the framework Tangpoon-

Patanasorn (2010) used to classify the linking adverbials. Then, by comparing the five most frequently used conjunctions of this study with the five most frequently used linking adverbials found in two sets of corpus used in Tangpoon-Patanasorn's (2010) study, it can be seen that the finding from this study is quite similar to the finding in the US students' corpus when five most frequently used linking adverbials is concerned. Comparing the US students' corpus with the data of this present study, a slight difference was detected. The slight difference meant here concerned with the order of conjunction 'so' and 'however' which was reversed in both data. In addition, the conjunction 'then' which was one of the five most frequently used linking adverbials found in the US students' corpus, however, was not one of the five most frequently used conjunction found in the data collected for this study.

Furthermore, even though the categorization of linking adverbials used by Tangpoon-Patanasorn (2010) is different from the Halliday and Hasan (1976) classification of conjunction adopted by this study, they bare some similarities as well in terms of the linguistic items. For instance, The linguistic items which fall in the result/inference type of linking adverbials category are similar to those which fall in the category of causal conjunction, such as the word 'therefore' and 'so'. The category of concession/ contrast of linking adverbials can be treated as the equivalent of the adversative conjunction category and they share the same linguistic items such as "however", "nevertheless" and "instead". Likewise, the linking adverbial items belong to the category of enumeration/addition/summation is the combination of both the conjunction items found in the categories additive and temporal. Therefore, it appears that causal conjunction which is also known as result/inference linking adverbials in Tangpoon-Patanasorn's (2010) study, accounted for the highest proportion of conjunction/linking adverbials in both the data of this present study and also in the two sets of corpus data used by Tangpoon-Patanasorn (2010). This similar pattern of the use of conjunction

once again shows that the asynchronous online discussion tasks set by the instructor of the two courses incline to be argumentative in nature. However, in terms of the percentage of use of conjunction, the findings of this study differed from the findings of Dastjerti & Samian (2011) who investigated the cohesive devices employed by Iranian graduate non English majors in their argumentative writing.

Based on Halliday and Hasan Taxonomy of grammatical cohesion (1976), the researchers found that additive conjunction accounts for the highest percentage, followed by the causal conjunction, adversative conjunction and temporal conjunction. Following their findings, they explained that the pattern of the use of conjunction may be determined by the familiarity of students have towards the conjunction items. They found that students most of the times only opt to use the same conjunction items; for instance, it was found that the students often used the adversative conjunction 'but' and 'however' and they hardly used other adversative conjunction such as 'on the other hand' and 'on the contrary' in their writing. In sum, there are several reasons that may account for the pattern of use of conjunction devices. Firstly, the pattern of use of conjunction devices may depend on the writing style of the subjects. Secondly, it may be due to their preference in using certain type of conjunction. Thirdly, their familiarity towards the conjunction items which means that they may only use the conjunction items they are familiar with and they may avoid the other conjunction items that they found difficult with in order to reduce the errors made. Last but not least, the nature of the tasks assigned may also affect the pattern of conjunction devices used. Below shows the extractions of conjunction items found to appear in the data of the present study.

4.2.2.1 Examples of the use of additive conjunction:

Example 4.2.2.1.1 (Extracted from the SLA 1 threaded discussion transcript):

*Yes a teacher who is strict, forceful and harsh will no doubt cause the learner to feel more pressured and stress, resulting in them not being able to learn as much as they could as this causes their level of anxiety to increase. **Also**, due to this reason, their interest in learning would slowly diminish as they will no look forward to attending the lesson.*

Example 4.2.2.1.2 (Extracted from the RM 1 threaded discussion transcript):

*Hereby, I'd like to take this opportunity to clarify my statements **and** I hope this clears the misunderstanding.*

Example 4.2.2.1.1 shows the use of additive conjunction '*also*'. Using the word '*also*', the writer added another consequence of having a strict and forceful teacher. Example 4.2.2.1.2 shows the use of additive conjunction '*and*'. Using the word of 'and', the writer added that she hoped that her statements were able to clarify the misunderstanding she had caused earlier.

4.2.2.2 Examples of the use of adversative conjunction

Example 4.2.2.2.1(Extracted from the SLA 2 threaded discussion transcript):

*The insertion of sociocultural perspective is quite strong in our community. **But**, can I say that it has unwanted effect too?*

Example 4.2.2.2.2 (Extracted from the SLA 1 threaded discussion):

*Based on my experience as a second language learner, there were times when my anxiety level was high. **However**, it was this anxiety that prompt me to be well-prepared and give my best.*

Example 4.2.2.2.1 shows the use of adversative conjunction '*But*'. Using the word '*But*', the writer intended to show that contrary to expectation, while the practice of

sociocultural perspective which is quite popular then, there were some unwanted effects resulting from the embracement of sociocultural perspective. Example 4.2.2.2.2 shows the use of adversative conjunction '*however*' in expressing the sense of contrary to expectation. Although anxiety was believed by many as to impede learning, anxiety actually prompted the writer to be well prepared and gave her best. This was something contradicting with readers' expectation.

4.2.2.3 Examples of the use of the causal conjunction

Example 4.2.2.3.1 (Extracted from the RM 2 threaded discussion transcript):

It is very important to know why the interviewee is thinking differently from the others ***because*** *there might be other reasons that influence his or her opinion.*

Example 4.2.2.3.2 (Extracted from the SLA 1 threaded discussion transcript):

It is because the learner would need a better picture of what the topic's focus is and how to get it started with points that support that particular impromptu speech task. ***So,*** *this will somehow rather create the tendency of having high level of anxiety and low motivation.*

Example 4.2.2.3.1 shows the use of causal conjunction **'*because*'**. The writer used the causal conjunction 'because' to offer the reason why it was important to know the interviewee is thinking differently from the others. Example 4.2.2.3.2 shows the use of causal conjunction **'*So*'**. The write used the word **'*So*'** to show the effect arose from the need to complete the impromptu speech task

4.2.2.4 Examples of the use of temporal conjunction

Example 4.2.2.4.1(Extracted from the SLA 2 threaded discussion transcript)

I believe that; let's just let the children learn the English of fluency first before puberty.
***Then** we drill on accuracy so that they do not get thoroughly confused.*

Example 4.2.2.4.2 (Extracted from the SLA 2 threaded discussion transcript)

*So, I suggest that there should be an area for improvement in this approach as to **first**
identify the needs of it in terms of achieving students' goals in language learning.*

Example 4.2.2.4.1 shows the use of temporal conjunction '***Then'***. The writer used the
temporal conjunction 'then' to show the drilling on accuracy after the learning of
fluency. Example 4.2.2.4.2 shows the use of temporal conjunction 'first'. The writer
used the temporal conjunction ***'first'*** to show the process of identifying the needs of the
sociocultural approach needs to carried out before anything else.

After showing the examples of conjunction devices extracted from the data of the
present study, the next section will present the result of substitution. Substitution is
considered as a cohesive device by Halliday and Hasan (1976) and it is known as one of
the cohesive devices that contribute to the grammatical cohesion of a text.

4.2.3 Substitution

According to Halliday and Hasan, there are three types of substitution. They are known as the nominal substitution, verbal substitution and clausal substitution. The frequency presented in number of use of each type of substitution is tabulated and shown in Table 4.4 on below.

Types of Substitution	Frequency
Nominal Substitution	4
Verbal Substitution	5
Clausal Substitution	1

Table 4.4: The Frequency Presented in Number of Each Sub Category of Substitution Cohesive Device

Substitution devices were rarely found in the data of this present study. According to the results shown in Table 4.4 above, four instances of nominal substitution were found in the data, followed by five instances of verbal substitution and one instance of clausal substitution. These findings are in harmony with the findings of Yoon-Hee (2011) who studied the cohesive devices found in CMC texts. Yoon-Hee (2011) also found that the use of substitution was rare in her data. The examples extracted from the data which illustrate the use of each type of substitution cohesive are presented below. The rarity of substitution device being found in the data may be caused by the avoidance of the subjects for using this cohesive device.

4.2.3.1 The examples of nominal substitution:

Example 4.2.3.1.1 (Extracted from the SLA 2 threaded discussion transcript) :

*Because at least they already know the pattern of the structure, when they learn the grammar, they might just have to replace with the correct **one**.*

The 'one' appeared in example 4.2.3.1.1 above acted as the substituent for the correct pattern of the structure.

4.2.3.2 The examples of verbal substitution:

Example 4.2.3.2.1(Extracted from the SLA 2 threaded discussion transcript):

 *Some students will only speak when they are asked to **do so**.*

Example 4.2.3.2.2(Extracted from the RM 2 threaded discussion transcript):

*When the interviewee could not answer or give explanation regarding the question, interviewer should change or simplify his or her question. By **doing so**, the interviewee could be able to give or respond according to the questions.*

The combination of the 'verbal substitute '***do' +so'*** was considered as itself a form of verbal substitute by Halliday and Hasan (1976, p. 116). In example 4.2.3.2.1 above, ***'do+so'*** acted as the verbal substitute for the action 'speak'. In example 4.2.3.2.2 above, ***'doing +so'*** acted as the verbal substitute for the action i.e the interviewer should change or simplify his or her questions that was conveyed in the preceding sentence.

4.2.3.3 The examples of clausal substitution

Example 4.2.3.3.1(Extracted from the RM 1 threaded discussion transcript):

*Knowing what to highlight and discuss cleverly in the literature review is also crucial because if **not**, it would be merely a 'copy and paste' state with inadequate substance and critical judgment.*

In example 4.2.3.3.1 above, the word '***not'*** acted as the clausal substitute for 'not knowing what to highlight and discuss cleverly in the literature review'.

The previous section presents the information regarding the use of substitution device in the data. In the following section, the information on the use of the fourth grammatical cohesive device identified by Halliday and Hasan (1976) will be described. This cohesive device is known as ellipsis.

4.2.4 Ellipsis

According to Halliday and Hasan (1976), there are three types of ellipsis. They are known as the nominal ellipsis, verbal ellipsis and clausal ellipsis. The frequency presented in number of use of each type of ellipsis is tabulated and shown in Table 4.5 below.

Types of ellipsis	Frequency
Nominal ellipsis	2
Verbal ellipsis	0
Clausal ellipsis	1

Table 4.5: The Frequency Presented in Number of Each Sub Category of Ellipsis Cohesive Device

According to the results shown in Table 4.5 above, only two instances of nominal ellipsis and one instance of clausal ellipsis were detected from the data. The rarity of ellipsis found in the data of this present study once again resembles the findings of Yoon-Hee (2011). Yoon –Hee (2011) also found that the use of ellipsis was rare in her data. Avoidance of the subjects for using this cohesive device in threaded discussion may result in the low frequency of ellipsis in the data of this present study. The examples extracted from the data which illustrate the use of both the nominal and clausal ellipsis are presented.

4.2.4.1 Examples of the use of nominal ellipsis

Example 4.2.4.1.1 (Extracted from the SLA 1 threaded discussion transcript):

I have to agree with you that on the notion that assessments presented in both L1 and L2 learning situations are not very much different from one another. **Both** *would require the learners to perform orally or in written forms.*

Example 4.2.4.1.2 (Extracted from the RM 1 threaded discussion transcript):

Indeed, literature review is a combination of both summary and synthesis; however, a good literature review will manage to combine **both** *and present it like a story to the readers.*

In examples 4.2.4.1.1 and 4.2.4.1.2, the word 'both' was used as the head of the elliptical nominal group. In example 4.2.4.1.1, the head noun that was repudiated was 'the assessments presented in L1 and L2' presupposed from the preceding sentence. Again, in example 4.2.4.1.2, the head noun that was repudiated was 'summary and syntheses. It was also presupposed from the preceding sentence.

4.2.4.2 Examples of the use of clausal ellipsis

Example 4.2.4.2.1 (Extracted from the SLA 2 threaded discussion transcript):

Like I said before, many that are able to speak the second language, already picked it up at home. **Not from school.**

Example 4.2.4.2.1 above shows the use of clausal ellipsis. The subject and the elements of verbal group were repudiated in this example. The full sentence could be 'they picked it up not from school'.

In sum, there are four types of grammatical cohesive devices based on Halliday and Hasan (1976) taxonomy of grammatical cohesion. The sections above present the results and discussion for research question 1 which focuses on finding out the

frequency of each type of cohesive devices found in the data of this present study. The

following section will outline the results and discussion of research question 2.

4.3 Findings and Discussion of Research Question Two

Research Question Two:

What is the critical thinking performance attained by each threaded discussion?

Newman, Webb and Cochrane (1995) content analysis scheme which has been widely used to assess critical thinking found in asynchronous online discussion is used to assess the critical thinking found in individual threaded discussion transcripts for this study. As aforementioned, Newman, Webb and Cochrane (1995) identified 45 indicators of positive and negative criticalness. The 45 indicators of positive and negative criticalness were then grouped into 10 broad categories. Each broad category was further divided into two sub categories, namely the positive critical thinking indicator category and the negative critical thinking indicator category; for instance, one of the 10 broad categories known as O (Bringing in outside knowledge and experience) consists of the positive critical thinking indicator O+ (bringing outside knowledge or experience to bear on problem) sub category which branched out into another six different O+ indicators and the negative critical thinking indicator sub category O- which again branched out into another two different O- indicators which are known as OQ-(Squashing attempts to bring in outside knowledge) and O- (Sticking to prejudice or assumptions). In this study, instead of reporting the scores for all the six different O+ indicators individually, the score of each of the six different O+ (bringing outside knowledge or experience to bear on problem) indicators will be added up and the total amount of the scores will be reported under the positive critical thinking O+ (Referring to outside knowledge /experience) indicator sub category. The same method is used for the O- (Sticking to prejudice) category. The score of each of the two O- indicators will then be added up and the total amount of the score will be reported under the negative critical thinking O- (Sticking to prejudice) indicator sub category. The method used to calculate the scores

for O+ (Referring to outside knowledge/experience) positive critical thinking category of the topic 1 threaded discussion is presented in Table 4.6 below.

Six sub categories of O+ (Referring to outside knowledge /experience)	Score for each sub category of O+ (Referring to outside knowledge /experience)
OE+ (Drawing on personal experience)	3
OC+ (Refer to course material)	5
OM+(Use relevant outside material)	8
OK+(Evidence of using previous knowledge)	7
OP+(Course related problems brought in e.g. students identify problems from lectures and texts)	4
OQ+ (Welcoming outside knowledge).	19
Total of the scores of O+ positive critical thinking category	3+5+8+7+4+19= 46

Table 4.6: Score for each O+ sub categories obtained from Topic 1 Threaded Discussion

Referring to Table 4.6 above, O+ (bringing outside knowledge or experience to bear on problem) positive critical thinking category is further broken down into six O+ sub categories which are known as OE+ (Drawing on personal experience), OC+ (Refer to course material), OM+ (Use relevant outside material), OK+ (Evidence of using previous knowledge), OP+ (Course related problems brought in e.g. students identify problems from lectures and texts), and OQ+ (Welcoming outside knowledge). After adding up all the scores for each O+ sub categories, the overall score is 46. In addition, since there was no statement in topic 1 threaded discussion transcript being assigned with O- (Sticking to prejudice) indicators, the overall score for O- negative critical thinking category is deemed zero. The method used to report the overall score of both

O+ (Referring to outside knowledge/experience) and O- (Sticking to prejudice) sub categories will be applied to the rest of the positive and negative indicator sub categories.

In this study, the researcher will find out the frequency and percentage for each of the positive critical thinking indicator category and negative critical thinking indicator category and present the results in table form. In addition, the critical thinking ratio will also be calculated based on the formula provided by Newman, Webb and Cochrane and the results are then tabulated. The mathematical formula provided by Newman, Webb and Cochrane (1995) was explained earlier in the chapter three under the section 3.4.5. With reference to the coding procedure, all the statements coded under R+ (Relevance statements) indicator were also treated as clear and unambiguous statements. This is because when a sentence was deemed R+ (Relevant statements), it was a clearly stated sentence by itself without any ambiguity embedded within it. In other words, R+ (Relevant statements) statements were assigned AC+ (Clear and Unambiguous statements) code as well. This coding procedure was applied when coding all the threaded discussion transcripts. Based on the coding procedure adopted, the frequency and percentage of R+ (Relevant statements) and AC+ (Clear and Unambiguous statements) found in each transcript to be the same; for example, if the frequency of R+ (Relevant statement) was 140, then the frequency of AC+ (Clear and Unambiguous statement) was also 140 and if the percentage of R+ was 20%, the percentage of R+ was also 20%.

There were two different groups of participants. One group of participants consisted of the postgraduate students from Research Methodology course and they participated in the RM 1 and RM 2 threaded discussion sessions. The RM 1 and RM 2 threaded discussions are related to the issues related to research. Another group of students consisted of postgraduate students who enrolled in Second Language Acquisition course.

They participated in the SLA 1 and SLA 2 threaded discussion sessions. The SLA 1 and SLA 2 threaded discussions are related to matters concerning second language acquisition theories. The results and discussions for this research question will be divided based on each topic of the threaded discussion. In the following section, the results and discussion of each topic of the threaded discussion will be outlined. It begins with the presentation of the results and discussion of the RM 1threaded discussion transcript.

4.3.1 Results and Discussion for the RM 1 Threaded Discussion

The RM 1 topic of threaded discussion is presented in Appendix B (I). From the marking of the RM 1 threaded discussion transcript, it was found that most of the participants agreed with Dena Taylor in that the writing of literature review is not only concerned with the summarization and description of reading materials, but the readers must also be able to read the reading materials critically so that they are able to critique the reading materials properly. The participants tended to argue from various angles such as the aim and benefits of writing literature review. There were also some participants who provided the information regarding ways of writing a good literature review. Furthermore, some of the participants were concerned with the term 'discursive prose' and they provided definitions for the term. Questions related to writing literature review were also raised. For instance, question such as 'Should we add other research which findings contradicted with our own findings into our literature review?' was raised by the participant.

Example 4.4.1.1 extracted from the RM 1 threaded discussion transcript is presented below.

Example 1 extracted from the RM 1 threaded discussion transcript

Re: E Forum 1 (Jan 20-Feb9)

By XXX- Wednesday, 26 January 2011, 10:57 PM

> *Yes, I do agree with Dena Taylor that literature review is indeed a discursive prose and not just a description or a summary about previous researches done on the topic of interest. <R+>(Relevant statements), <AC+>(Clear and unambiguous statement). Although to a certain extent, literature review is written to acknowledge the presence of previous researches carried out over the years or the existence of certain theories, it should be written critically. <R+> (Relevant statement), <I+>(Important statement), <JS+>(Justifying solutions or judgments),<AC+> (Clear and unambiguous statement). In other words, we should analyze or evaluate a research work, show the relationships between different researches, and explain how these researches relate to our own research <R+> (Relevant statement), <I+> (Important statement), <L+> (Generate new interpretation from the information), <P+> (Discussing practical utility of new ideas), <W+>(Widening the discussion),<AC+>(Clear, unambiguous statement).*

> *There is this false assumption among students that all the piece of literature written should only agree with our research area to make our work seem more "valid" <R+>(Relevant statement),<I+>(Important statement),<NP+>(New problem-related information),<W+> (Widen discussion), <L+> (Generating new data from information collected),*

<AC+>(Clear, unambiguous statement). This is not true!<AC+>(Clear, unambiguous statement),<R+>(Relevant statement),<I+>(Important statement). A literature review should provide a context for a research by looking at previous work done in the research area so that one may argue or agree on certain findings which holds a different view or similar to an area of interest <AC+>(Clear, unambiguous statement),<JS+>(Justifying solutions or judgments),<P+> (Discuss practicality of new idea),<NP+>(new problem-related information),<W+>(Widen discussion), <R+> (Relevant statement),<I+>(Important statement).There must also be a flow on each of the points discussed instead of making all the points detached from one another <R+>(Relevant statement),<AC+> (Clear, unambiguous statement), <I+>(Important statement),<NP+>(New problem-related information), <W+>(Widen discussion), <L+> (Generating new data from information collected)<P+>(Discuss practicality of new idea).

Referring to example 4.4.1.1 above, the participant provided her insights regarding what should be included in a literature review. For instance, according to her, students should be able to demonstrate their critical thinking skills when writing the literature review. One way to show that the students were able to think critically was that they were able to evaluate other researchers' work and linking all the information in a coherence way. Besides that, she also highlighted the misconception students may have when writing literature review. They might only cite those research works that concurred with the students' research findings or perception could be included into their literature review. She tried to dispel this misconception by stating that the students could also add onto

their literature review the researchers' works which presented different findings and views.

The frequency and percentage for each positive and negative critical thinking indicator sub category belong to the RM 1 threaded discussion are tabulated. The results are shown in Table 4.7 and Table 4.8 below.

Positive Indicators	AC+	C+	I+	JS+	L+	N+	O+	P+	R+	W+	Total
Frequency	213	58	112	72	67	114	46	26	213	60	981
Percentage %	18.65	5.08	9.81	6.30	5.87	9.98	4.03	2.28	18.65	5.25	85.90

Table 4.7: The Frequency and Percentage of Positive Critical Thinking Indicator Sub Categories of the RM 1 Threaded Discussion

Negative Indicators	AC-	C-	I-	JS-	L-	N-	O-	P-	R-	W-	Total
Frequency	37	25	15	11	7	19	0	7	31	9	161
Percentage %	3.24	2.19	1.31	0.96	0.62	1.66	0	0.62	2.72	0.79	14.11

Table 4.8: The Frequency and Percentage of Negative Critical Thinking Indicator Sub Categories of the RM 1 Threaded Discussion

Table 4.7 and Table 4.8 above present the results of critical thinking indicators or positive critical thinking indicators and uncritical thinking indicators or negative critical thinking indicators respectively. Being able to write a good piece of literature review is a crucial skill for postgraduate students to acquire. Thus, knowledge regarding literature review has been highlighted and imparted in Research Methodology course. RM 1 requires the participants to read the statement put forth by the expert of the field, Dena Taylor regarding her perspective on what literature review meant to her. Then, the participants were asked to state the extent to which they agree with Dena Taylor's statement. Since both *Research Methodology* and *Second Language Acquisition* courses

were taught by the same instructor, the participants from both courses complied with the same rule and assessment format set by the instructor. They were required to give their own opinion at least once and they are required to response to their peers' opinions at least twice.

With reference to Table 4.7 and Table 4.8, it is obvious that the overall percentage of positive criticalness (85.9%) is higher than the percentage of negative criticalness (14.11%). There are 981 occurrences of positive criticalness and 161 occurrences of negative criticalness identified from the transcript.

Where positive criticalness is concerned, Table 4.7shows that R+ (Relevant statements) (18.65%), AC+ (Clear and Unambiguous statements) (18.65%), N+ (Novelty) (9.98%) and I+ (Important points) (9.81%) are apparently the four most frequently detected indicators and the least detected indicators are P+ (Discussing the practicality of new ideas and suggesting solutions) (2.28%), followed by O+ (Referring to outside knowledge/experience) (4.03%) and C+ (Critical assessment of others' or own contribution) (5.08%).

The result tabulated in Table 4.7 indicates that the participants were able to locate relevant (R+) and new information (N+) and include them into the threaded discussion, be it taken from sources such as books, background knowledge or by providing their own new and reasonable insights and justifications on this topic especially when arguments were presented. The coding example 4.4.1.2 which was assigned with positive critical thinking indicators is extracted from the RM 1 threaded discussion transcript.

Example 4.4.1.2 extracted from the RM 1 threaded discussion transcript

I do agree with Pauline. <C+> (Critical assessment or evaluation of own or others' contributions) It is better if we can give our personal comments and

opinion together with relevant explanation and justification because it will portray of our level of understanding on our research. <JS+>(Justifying solutions or judgments), <R+>(Relevant statement), <I+>(Important statement), <OQ+>(Welcoming outside knowledge),<NQ+>(Welcoming new ideas), <L+> (Generating new data from information collected), <W+>(Widen discussion), <NL+>(Learners bring new things in).

Referring to example 4.4.1.2 shown above, the participant agreed with other participants' viewpoints after pondering on it critically <C+>. She also further reasoned out <JS+> why she agreed with the viewpoints by inserting relevant <R+> , important <I+>, new generated interpretation <L+>. Her claims were also assumed as the new thing brought in by the participant <NL+>. This shows that she welcomed outside and new knowledge <OQ+>, <NQ+> as she had responded to other people's viewpoints critically. In sum, her contribution to the threaded discussion widened the scope of discussion <W+>.

Where negative criticalness reading tabulated in Table 4.8 is concerned, the A- (ambiguous and unclear statement) (3.24), R- (irrelevant statement) (2.72) and C- (Uncritical acceptance or unreasoned rejection) (2.19) and N- (1.66) are the most frequently detected negative critical thinking indicators. From the transcripts, it was found that ambiguities (coded as A-) are linked to unjustifiable statements and also remarks that were not linked to the previous context. Some of these ambiguous statements were also marked as irrelevant (R-) statements. The statements that were coded as N- were those repeating what has been mentioned earlier and also those which were considered false or trivial leads. The statements that were marked as C- (Uncritical acceptance or unreasoned rejection) are statements produced which stated that they agreed to others' comments without giving any reasons. This could be due to the unavailability or lack of information that could be used to oppose or further

strengthen and support the viewpoints found in others' comments. Another reason that led to this finding may be the lack of related knowledge among the participants, causing them to simply accept the other comments without deliberating on them. The least found uncritical thinking indicators were I- (Unimportant, trivial statements) (0.62%), P- (Discuss in a vacuum) (0.62%) and O- (Squashing attempts to bring in outside knowledge or sticking to prejudice or assumptions) (0%). Below is the coding example which was assigned with negative critical thinking indicators. It is extracted from the RM 1 threaded discussion transcript.

Example 4.4.1.3 extracted from the RM 1 threaded discussion transcript

> *I just think there is a relationship between research and rigorous research attitude. <R-> (Irrelevant statement), <AC-> (Confused statement), <P-> (Discuss in a vacuum). Let us be 'The person maybe actually highlighting the area'. <R-> (Irrelevant statement), <AC-> (Confused statement), <P-> (Discuss in vacuum)*

With reference to example 4.4.1.3, the participant's statements were marked <R-> (Irrelevant statement), <AC-> (ambiguous, confuse, and unclear statement) and <P-> (Discuss in vacuum). This coding results show that the statements were ambiguous in meaning <AC->, rendering them to be assigned as irrelevant <R-> and out of topic <P->.

Apart from calculating and reporting the frequency and percentage of each indicator category, the critical thinking ratio for each broad critical thinking category for RM 1 threaded discussion is also calculated and reported. Table 4.9 on the next page presents the critical thinking ratio for each of the 10 broad categories of critical thinking, calculated based on the mathematical formula provided by Newman, Webb & Cochrane (1995).

Indicators	Critical Thinking Ratio
Relevance (R)	0.746
Importance (I)	0.764
Novelty (N)	0.714
Outside knowledge/experience (O)	1.000
Ambiguities (A)	0.704
Linking Ideas (L)	0.811
Justification (J)	0.735
Critical Assessment (C)	0.398
Practical Utility (P)	0.576
Width of understanding (W)	0.739

Table 4.9: Critical Thinking Ratio of the RM 1 Threaded Discussion

Judging from Table 4.9, the critical thinking indicator O (bringing in outside knowledge and experience) scores the highest ratio which is 1, followed by critical thinking indicator linking of ideas (L) 0.811, Importance (I) 0.764 and Relevance (R) 0.746. The second lowest critical thinking ratio belongs to practical utility indicator (P) 0.576 and the lowest critical thinking ratio belongs to critical assessment indicator (C) 0.398. The O (bringing in outside knowledge and experience) indicator scores the highest is expected because many participants included a lot of outside reading materials to back up their arguments. The linking of ideas, indicator's (L) score is also quite high and this indicated that the participants were able to generate new interpretation and able produce coherence texts. The scores for both P (Practical Utility) and C (Critical Assessment) are considered the lowest compared to others. One possible reason why Practical utility (P) critical thinking indicator ratio is low is that this topic might not require participants

to solve problems so there is no need for them to discuss and suggest any practical solutions. Another possible reason is some statements were found to be out of topic and ambiguous in their meaning, rendering the coder to code them as P- which means "discuss in vacuum". Critical assessment (C) indicator scores the lowest critical thinking ratio may be caused by the reasons aforementioned when the reading of C- (Uncritical acceptance or unreasoned rejection) is concerned. The rest of critical thinking indicators' critical thinking ratio readings fall within the range of 0.7 to 0.74; for instance, the critical thinking ratio of A (Ambiguities) indicator is 0.704, while the ratio of J (Justification) indicator is 0.735 and the ratio of W (Width of understanding) indicator is 0.739.

In the next section, the frequency and percentage of each positive and negative critical thinking sub category, together with the critical thinking ratio of RM2 threaded discussion were presented. RM 2 requires the participants to study and comment on the two scenarios of interview sessions. Interview technique is also one of the topics covered under the Research Methodology course besides literature review.

4.3.2 Results and Discussion of the RM 2 Threaded Discussion

The RM 2 topic of threaded discussion is presented in Appendix B (I). In RM 2, the participants were given two scenarios. The two scenarios depicted the two situations where the each interviewer conducted interview with his interviewee. Based on these two scenarios, the participants were required to discuss the aspects that should be taken into considerations when conducting interview. Their discussion focused on several issues; for instance, the importance of adhering to research questions when designing the interview questions and also during the interview process , the importance of using probing interview technique, the need and suitability of paraphrasing the interview questions and interviewee's answer, the need and suitability of providing definition of

certain terminology to the interviewee and prioritizing interview questions due to time constraints and research objectives. Presented below is an example extracted from the RM 2 threaded discussion transcript.

Example 4.4.2.1 extracted from the RM 2 threaded discussion transcript

By ELL- Monday, 7 March 2011, 10:34 AM

I think the most important point to note before analyzing both the situation is: What's the Research Question that the interviewer is aiming to answer? (R+) (Relevant statement),(AC+) (Clear, unambiguous statement),(I+) (Important statement),(OC+) (Refer to course material). By having the RQ in view, the interviewer is able to shape and be flexible in the questions that are asked. (JS+)(Justified statement), (R+)(Relevant statement), (AC+)(Clear, unambiguous statement), (I+)(Important statement). Different interviewee with different style of communication and temperament may require different way to probing for an answer.(JS+)(Justified statements) (R+) (Relevant statement),(AC+), (Clear, unambiguous statement), (I+) (Important statement),(NL+)(Learner brings in new things),(W+)(Widen discussion).

Anyway, coming back to the discussion topic, in situation A, possibly the statement about one's perception regarding AIDS was not the main thing that the interviewer was looking for, therefore he/she did not dwell too long in that statement and moved on to another more pressing question (more so when the interviewee is not very articulate in his/her points). (JS+)(Justifying solutions or judgments) (R+)(Relevant statement), (I+)(Important statement), AC+(Clear, unambiguous statement). One thing to note too is that sometimes there's time constraint during the interview. Hence prioritization of questions is important. (NL+)(Learner brings new things in), (OC+)(Refer to course material),

(R+)(Relevant statement),(AC+)(Clear, unambiguous statement),(I+)(Important statement), (W+)(Widen discussion).

In Situation B, I think the interviewer did a good job in rephrasing the interviewee's statement. (R+)(Relevant statement), (I+) (Important statement),(AC+)(Clear, unambiguous statement,)(W+)(Widen discussion), (C+) (Critical assessment of other's or own contribution) .This allows the interviewee a chance to agree with his/her previous statement and the interviewer to truly understand what is articulated (JS+)(Justifying solution or judgments),(R+)(Relevant statement),(I+) (Important statement) (AC+)(clear, unambiguous statement). One point to note during interview is never assumed we understand what the other person is saying. (JS+)(Justifying solutions or judgments),(R+)(Relevant statement)(I+)(Important statement)(AC+)(Clear, unambiguous statement),(NL+)(Learner brings in new things), (OC+) (Refer to course material).It's always good to rephrase the statement and ask for confirmation.(JS+)(Justifying solutions or judgments),(R+)(Relevant statement),(AC+)(Clear, unambiguous statement),(I+)(Important statement).

Hence in summary, few aspects to take note when conducting an interviewing(R+)(Relevant statement),(AC+)(Clear, unambiguous statement),(I+)(Important statement)

1. What's the Research Question?

2. Be aware of time constraints and prioritize questions.

3. Never assume. Rephrase and confirm.

Referring to example 4.4.2.1, it is noticed that the participant highlighted several issues regarding interview. Firstly, she touched on the importance of bearing in mind the

research question in helping interviewer to prepare interview questions and also during interview when there was a need to create extra interview questions. Then, realizing that time constraint could be a problem for the interviewer, she then proposed that prioritizing the interview questions may be helpful under this situation. In order to confirm that the interviewer understood the interviewee's responses correctly, she proposed to rephrase the interview question and asked the interviewee again.

Next, the frequency and percentage for positive and negative critical thinking indicator sub categories found in the RM 2 threaded discussion are tabulated. The results are demonstrated in Table 4.10 and Table 4.11 below.

Positive Indicators	AC+	C+	I+	JS+	L+	N+	O+	P+	R+	W+	Total
Frequency	153	29	85	72	124	115	29	48	153	28	836
Percentage %	17.31	3.28	9.62	8.15	14.03	13.01	3.28	5.43	17.31	3.17	94.59

Table 4.10: The Frequency and Percentage of Positive Critical Thinking Indicator Sub Categories of the RM 2 Threaded Discussion

Negative Indicators	AC-	C-	I-	JS-	L-	N-	O-	P-	R-	W-	Total
Frequency	4	6	6	3	10	11	0	0	5	3	48
Percentage %	0.45	0.68	0.68	0.34	1.13	1.24	0	0	0.57	0.34	5.43

Table 4.11: The Frequency and Percentage of Negative Critical Thinking Indicator Sub Categories of the RM 2 Threaded Discussion

With reference to both Table 4.10 and Table 4.11 above, it is found that the positive critical thinking indicators contribute 94.59% while the negative critical thinking indicators contribute 5.43 % to the overall scoring. There are 836 occurrences of positive criticalness and 48 occurrences of negative criticalness found.

Referring to Table 4.10 above , AC+ (Clear and Unambiguous statements) (17.31%), R+ (Relevant statements) (17.31%), L+ (linking of ideas and generating new data from information collected) (14.03%) and N+ (Novelty) (13.01%) are the positive critical thinking indicators that are the most frequently found indicators in participants' postings. The least frequently found positive critical thinking indicators in participants' postings are C+ (Critical assessment of others' or own contribution) (3.28%), O+ (Referring to outside knowledge/experience) (3.28%) and W+ (Widen the discussion) (3.17%). Similar with the results found in RM 1, R+ (Relevant statements) and N+ (Novelty) remain the two most frequent found indicators, while a slight difference is detected which is linked to the emergence of L+ (Linking of ideas and generating new data from information collected) as the one of the most frequent detected indicators. Compared with the results tabulated in Table 4.7, the percentage of L+ (Linking of ideas and generating new data from information collected) shown in Table 4.10 is higher, that is 14.03%. This indicates that participants had improved by utilizing their skills of linking of ideas and generating new data from information collected. According to the Newman et.al content analysis scheme (1995), there are two characteristics in the postings that could be marked as L+ (Linking of ideas and generating new data from information collected). Firstly, the postings must exhibit that the ideas are linked coherently and secondly, the postings must show the attempt of participants in generating new interpretation after reading the others' postings. The participants' improvement in L+ (Linking of ideas and generating new data from information collected) score may be linked to the experience they obtained from the RM 1 threaded discussion which was their first encounter with threaded discussion since many of them were first timers in using threaded discussion, particularly threaded discussion designed for academic purpose. Furthermore, the way the participants linked their ideas while constructing their postings was likely to be improved due to the feedback they obtained

from the instructor who marked the RM 1 transcript for assessment purpose. Presented below is the coding example 4.4.2.2 which was assigned with positive critical thinking indicators. It is extracted from the RM 2 threaded discussion transcript.

Example 4.4.2.2 extracted from the RM 2 threaded discussion transcript

I think the most important point to note before analyzing both the situation is: What's the Research Question that the interviewer is aiming to answer? <R+>(Relevant statement), <I+>(Important statement), <OC+>(Refer to course material). By having the RQ in view, the interviewer is able to shape and be flexible in the questions that are asked.<JS+>(Justifying solutions or judgments), <R+>(Relevant statement), <I+>(Important statement).

Referring to example 4.4.2.2 above, the participant provided relevant <R+> and important claims <I+>. She also justified the importance of having research questions in view by stating the benefit of doing so <JS+>. The important claims <I+> she made was assumed to be taken from course material; for example, lecture notes <OC+>.

Table 4.11 demonstrates the scoring of negative or uncritical thinking indicators. The most frequently detected negative critical thinking indicators are N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution) (1.24 %), L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments) (1.13 %), C-(Uncritical acceptance or unreasoned rejection) (0.68 %) and I- (Unimportant or trivial statements) (0.68 %). The least found uncritical thinking indicators are JS- (Offering judgments or solutions without explanations or justifications) (0.34%), W- (Narrow the discussion) (0.34%), O-(Squashing attempts to bring in outside knowledge or sticking to prejudice or assumptions) (0%) and P- (Discuss in vacuum) (0%). Compared with the findings in the

Table 4.8, the overall percentage of uncritical thinking statements in Table 4.11 above is much lower. This could be due to the fact that they had received feedback from the instructor on their RM 1 threaded discussion session, causing the participants to know how to engage in the threaded discussion and thus perform better.

Apart from the instructor's feedback, another factor that was likely to cause the participants to perform better in RM 2 threaded discussion as compared to their performance in RM 1 threaded discussion was the prior knowledge they have with regards to the issues of threaded discussion. Chou and Chen (2010) conducted a study to investigate how culture may affect the Chinese students' perception with regards to online learning through the use of asynchronous online discussion board in distance education programs in an American university. They reported that the subjects of their interview who consisted of six Chinese graduate students had stated that topic familiarity would be a factor that would affect their willingness to write postings. In other words, if they had prior knowledge towards a particular topic of discussion, they would be more willing to write and post more postings. This again suggests that when the participants are familiar with the topic of discussion, they will be engaging in a more meaningful discussion because they could contribute more input into the overall discussion. This finding could be applied to explain why the participants of this study tended to perform better in RM 2 than in topic RM1. The participants of this study might have more knowledge on interview technique as compared to issues related to literature review. This was likely to cause them to be able to discuss the second topic better than the first topic.

In terms of the similarity of negative critical thinking indicators results, the negative critical thinking indicators N- and C- are considered the two most frequently detected indicators of both the RM 1 (See Table 4.8) and the RM 2 (See Table 4.11) threaded discussions. However, the difference identified between the results shown in Table 4.8

126

and Table 4.11 above is due to the emergence of both L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments) and I- (Unimportant or trivial statements) from the RM 2 threaded discussion. L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments)   and I- (Unimportant or trivial statements) uncritical thinking indicators (See Table 4.11) replaces both A- (Confuse statements) and R- (Irrelevant statements) uncritical thinking indicators which are deemed as the two most frequently found uncritical thinking indicators in RM 1 threaded discussion (See Table 4.8). L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments) and I- (Unimportant or trivial statements) then become the two most frequently found uncritical thinking indicators in RM 2 transcript.

This difference implies that the ambiguous and irrelevant statements produced by the participants reduced in numbers. Despite this, the high percentage of L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments)   and I- (Unimportant or trivial statements) might show that participants faced problems in generating new interpretation and producing important inputs during the threaded discussion. Presented below is the coding example 4.4.2.3 which was assigned with negative critical thinking indicators. It is extracted from the RM 2 threaded discussion transcript.

Example 4.4.2.3 extracted from the RM 2 threaded discussion transcript

I agree to your opinion that in situation A that "prioritization of question is important' and perhaps the interviewee was facing time constraint. <L-

>(Stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments), <NS->(Accepting first offered solution), <C->(Uncritical acceptance or unreasoned rejection). Besides, I also agree that one must not assume (layman term: put words into someone mouth, in asking for clarification. instead, the questions should be paraphrased. <L->(Stating that one shares the ideas or opinions stated, without taking further or adding any personal comments), <NS->(Accepting first offered solution), <C->(Uncritical acceptance or unreasoned refection)

With reference to example 4.4.2.3 above **,** the participant simply agreed to the others' comment without taking further effort to elaborate on her own stance <C->. She appeared to be accepting the first offered solutions to the problem <NS->and she repeated the information mentioned in previous posting without proposing new interpretation <L->.

Apart from reporting on the frequency and percentage of each critical thinking indicators sub category, the researcher also calculated the critical thinking ratio for RM 2 threaded discussion. Table 4.12 below demonstrates the critical thinking ratio for each critical thinking indicator.

Indicators	Critical Thinking Ratio
Relevance (R)	0.937
Importance (I)	0.868
Novelty (N)	0.825
Outside knowledge/experience (O)	1.000
Ambiguities (A)	0.949

Linking Ideas (L)	0.851
Justification (J)	0.920
Critical Assessment (C)	0.657
Practical Utility (P)	1.000
Width of understanding (W)	0.807

Table 4.12: Critical Thinking Ratio of the RM 2 Threaded Discussion

Based on Table 4.12, it is noted that O (Bringing in outside knowledge /experience) and P (Practical Utility) scores the highest ratio which is 1, while C (Critical Assessment) scored the lowest ratio which is 0.657. The rest of the indicators ratio values fall within the range of 0.8 to 0.95; for example, the ratio for W (Width of understanding) was 0.807 while the ratio for A (Ambiguities) is 0.949. O (Bringing in outside knowledge/experience) category for both the RM 1 and RM 2 share the similar critical thinking ratio value that is 1 (See Table 4.9 and Table 4.12). Again, the input contributed by participants were generated based on their previous knowledge and experience as both interviewer and interviewee or drawn from the relevant external materials such as online sources and all these in turn resulted in high O (Bringing in outside knowledge/experience) ratio. However, in RM 2 threaded discussion, P (practical Utility) emerges to be another category that its ratio is also 1. In other words, no P- (Discuss in vacuum) statements are detected in the RM 2 threaded discussion transcript as compared to Table 4.9 above where seven instances of P- (Discuss in vacuum) statements are detected in RM 1 threaded discussion. This indicates that the participants not only improved in terms of their ability in offering solutions and discussing the practical utility of the suggested solutions, but also improved in their ability to avoid discussing ideas in vacuum. Although RM 2 threaded discussion was not about problem solving, the participants had included in the threaded discussion

some practical ideas on how to effectively conduct an interview by suggesting what should be avoided during the interview session and why. In addition, they also offered their viewpoints regarding when and why certain solutions would and would not work during the interview sessions. All these inputs contributed to the high score of P (Practical Utility) indicator for RM 2. Presented below is the example 4.4.2.4. It is extracted from the RM 2 threaded discussion transcript. It exhibits the presence of practical utility (P+).

Example 4.4.2.4 extracted from the RM 2 threaded discussion transcript

Re: What's the Question?

by?Tanusha Rathakrishnan?- Sunday, 13 March 2011, 02:40 AM

Very true. Whatever happens during the interview, an interviewer should keep his or her research questions in mind and not stray far from them. Assuming what an interviewee is trying to say should be avoided at all cost if a researcher or an interviewer would like to collect solid answers from an interview's perspective. <P+>(Discuss practical utility of new ideas), <R+>(Relevant statement), <I+>(Important statement).

Your explanation on time constraint presses on the reality of what may happen during an interview session and in times like this the interviewer has no choice but to prioritize questions.

However, I believe that an interview session should be planned well in order to avoid the situation of having to skip from one question to another abruptly without dwelling into an interviewee's feedback. <P+>(Discuss practical utility of new ideas) , <R+>(Relevant statement), <I+>(Important statement), <C+>(Critical assessment or evaluation of own or others' contributions), <AC+>(Clear, unambiguous statement), <NL+>(Learner brings new things in),

130

<W+>(Widen discussion). The interviewer may miss a valuable information from the interviewee like what happened in situation A (if at all the interviewer is facing time constraint).

If the question is not important for a research, perhaps the question need not be asked at all. <P+>(Discuss practicality of new ideas), R+(Relevant statement), AC+(Clear, unambiguous statement). But in my opinion, going back to situation A & B, knowing an interviewee's perception on AIDS is significant in that particular research. Even if the question is not the main thing the interviewer is looking for, an interviewee's answer may have a key point in contributing to the research concerned. Can we then assume that since this question is not significant or since the interviewee was not able to explain her answer, it's better to just skip to the next question without giving an opportunity for the interviewee to explain what she or he really mean? To highlight, in Situation A, the interviewer actually gave his or her answer and the interviewee "guessed" that the interviewer got the point. But what exactly is the point?

Therefore, I agree that prioritizing question is important. <P+> (Discuss practical utility of new ideas), R+(Relevant statement), AC+(Clear, unambiguous statement).But it should be done when the interviewer is preparing the questions as well as to allocate sufficient time for each questions (including follow-up questions). <P+>(Discuss practical utility of new ideas) , <I+>(Important statement), <R+>(Relevant statement), <AC+> (Clear, unambiguous statement).There should be certain time flexibility. <P+>(Discuss practical utility of new ideas), <I+>(Important statement) , <R+>(Relevant statement), <AC+>(Clear, unambiguous statement).Sometimes rushing an interviewee during an interview would make him or her uncomfortable and thus, limit their intended feedback. <P+>(Discuss practical utility of new ideas),

<JS+>(Justifying solutions or judgments), <NS+>(New solutions to problem), <R+>(Relevant statement), <AC+>)(Clear, unambiguous statement), <I+> (Important statement), <OK> (Using previous knowledge).An interview session should be paced well. If a question is not needed, then it should not be asked in the first place to avoid time waste.

Referring to example 4.4.2.4 extracted from the RM 2 threaded discussion above, it is noted that the participant brought up several practical issues related to the conduct of interview session. Firstly, she mentioned that interviewer should not guess what the interviewee said if the interviewer did not really understand the exact meaning of the messages the interviewer conveyed as by making own assumption, it caused the interviewer to lose important information. In addition, she highlighted the importance of prioritizing the interview question especially under time-constrain situation. She also emphasized that skipping from one question to another abruptly should be avoided as this would cause the interviewer to fail to probe further into the interviewee's feedback. Furthermore, she commented on when and how prioritizing question should be done. As stated by the participant above, prioritizing question should be carried out when the interviewer was preparing the interview questions and the interviewer should try to ensure that sufficient time was allocated for each question which included follow-up-questions. She also proposed that by avoiding asking unnecessary questions, it would ensure the interview session to pace well.

It is also noted that the C (Critical Assessment) ratio for RM 2 (See Table 4.12) is the lowest among the other indicators and this resembles the finding for RM 1 where the C (Critical Assessment) ratio is also the lowest as compared to other indicators (See Table 4.9). However, C (Critical Assessment) ratio for RM 2 is higher than that of RM 1. This implies that the participants were engaging more in assessing their peers' comments critically instead of accepting or rejecting them indiscriminately. In sum, it seems that

the participants performed better in RM 2 than in RM1 by comparing the results tabulated in Tables 4.10, 4.11, and 4.12 with the results tabulated in Tables 4.7, 4.8 and 4.9.

In the following section, the results of the SLA 1 threaded discussion were presented. SLA 1 topic of threaded discussion focused on Krashen's second language acquisition theory. SLA 1 topic of threaded discussion highlighted four aspects mentioned by Krashen's in his second language acquisition theory which were affective filter, self-confidence, motivation and anxiety. Krashen's second language acquisition theory has been influential in the field of language acquisition. The debatable nature of Krashen's second language acquisition theory became the reason why SLA 1 was designed as such. SLA 1 was designed with the aim of allowing the participants who were students from the *Second Language Acquisition* course to reflect on Krashen's theory and to propose their critiques towards his theory of second language acquisition in order to increase and deepen the participants' understanding towards his theory.

4.3.3 Results and Discussion of the SLA 1 Threaded Discussion

The SLA 1 topic of threaded discussion is presented in Appendix B (II). The frequency and percentage for each of the positive and negative critical thinking indicator sub categories detected in the SLA 1 threaded discussion are tabulated. The results are demonstrated in Table 4.13 and Table 4.14 on the next page.

Positive Indicators	AC+	C+	I+	JS+	L+	N+	O+	P+	R+	W+	Total
Frequency	287	81	40	140	134	247	133	16	287	120	1485
Percentage %	18.84	5.32	2.63	9.19	8.80	16.21	8.73	1.05	18.84	7.88	97.49

Table 4.13: The Frequency and Percentage of Positive Critical Thinking Indicator Sub Categories of the SLA 1 Threaded Discussion

Negative Indicators	AC-	C-	I-	JS-	L-	N-	O-	P-	R-	W-	Total
Frequency	5	3	5	6	5	5	0	0	4	6	38
Percentage %	0.33	0.20	0.33	0.39	0.33	0.33	0	0	0.26	0.39	2.56

Table 4.14: The Frequency and Percentage of Negative Critical Thinking Indicator Sub Categories of the SLA 1 Threaded Discussion

Referring to Table 4.13 and Table 4.14 above, it is obvious that, overall, the percentage of positive criticalness (97.49%) is higher than the percentage of negative criticalness (2.56 %). There were 1485 occurrences of positive criticalness and 38 occurrences of negative criticalness detected from the transcript.

Where positive criticalness of the SLA 1 threaded discussion is concerned, R+ (Relevance) and AC+ (Clear and unambiguous statements) which shared the same percentage value that is 18.84%, N+ (Novelty) (16.21%) and JS+ (Justification) (9.19%) are apparently the four most frequently detected indicators and the least detected indicators are C+ (Critical assessment of others' or own contribution)(5.32%), followed by I+ (Importance) (2.63%) and P+ (Discussing the practicality of new ideas and suggesting solutions) (1.05%). These findings indicate that the participants were able to produce relevant and clear statements, bring in novel ideas and rationalize their arguments. However, their lack of competence in incorporating important input and

critiquing their peers' contributions was detected if one refers to the percentage of both I+ (Important points) and C+ (Critical assessment of others' or own contribution). The P+ (Discussing the practicality of new ideas and suggesting solutions) indicator's percentage value is the lowest. This was probably because the topic of discussion was not designed for problem solving and it did not require participants to suggest solutions and discuss the practicality of each solution. Presented below is the coding example 4.4.3.1 assigned with positive critical thinking indicators extracted from the SLA 1 threaded discussion transcript.

Example 4.4.3.1 extracted from the SLA 1 threaded discussion transcript

I am interested in your new 'formula' in which you stated that;

$\uparrow motivation — \uparrow anxiety = \downarrow input$ *<OQ+>, <NQ+>, <C+>*

Although it might sound slightly illogical, but i did experience this situation previously. <JP+> (Providing proof or examples), <R+> (Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion), <NL+>(Learner brings new things in), <L+>(Generating new data from information collected) I used to enjoy my foreign language classes, until the new teacher came. <JP+> (Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion) , <NL+>(Learner brings new things in),<L+> (Generating new data from information collected). She was strict most of the times and expected us to be so fluent, so much so that all of us were extremely anxious during learning that we became so motivated to learn in order to avoid being morally put down. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion), <NL+>,(Learner brings new things in), <L+>(Generating new data from

information collected).We started to become competitive instead of cooperative. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion) , <NL+>(Learner brings new things in),<L+>(Generating new data from information collected). But at the end of the semester, all of us did so poor in our tasks, both written and oral. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion),<NL+>(Learner brings new things in) , <L+>(Generating new data from information collected) Partly because we refrained ourselves from asking questions during lessons due to our anxiety.<JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion) ,<NL+>(Learner brings new things in), <L+> (Generating new data from information collected).

With reference to example 4.4.3.1,the participant claimed that she agreed with the claim made by her peer in previous posting. She justified her stance by taking herself learning experience as example. Her whole recount of her experience as learner of a second language was coded as relevant (R+), learner brings in new ideas (NL+), bringing in outside experience (OE+), widening the scope of discussion (W+) and also as generating new interpretation from information collected (L+).

When discussing second language learning, the participants basically agreed that Krashen's statement held truth to a certain extent. In other words, Krashen's theory can be applied to explain and justify some instances of second language learning, but not all the instances. In general, the participants supported their own arguments and rebutted their peers' viewpoints by making reference to their own experience as second language learners and from their observations as second language teacher. In addition, their views

regarding the correlations among motivation, self -confidence, and the amount of input received by second language learners varied greatly. Motivation, self-confidence and the amount of input received were all known as affective variables introduced in Stephen Krashen (1981) Affective Filter Hypotheses. The participants recognized and pointed out that it would be too simplistic to agree to the view that highly motivated and confident learners tended to receive more input than those whose motivation and self - confidence were lower. They argued that the amount of input received was not only affected by motivation and self-confidence factors. According to the participants, there were other external factors such as personality traits, learning environment, task type, teachers-students and students-students relationships which accounted for the amount of input received by second language learners. In fact, some argued that possessing high motivation does not imply that one will have high confidence and vice versa. Highly motivated learners may not have high confidence within themselves, for example, when they were asked to present themselves orally in front of the class, they were anxious and this caused them to perform badly. As cited by Chan and Wu (2004), this is what was recognized as communication apprehension, one of the three foreign language anxiety recognized by Horwitz, Horwitz and Cope (1986). The diversity of viewpoints, nonetheless, widened the scope of threaded discussion. The widening of threaded discussion took place when the content of the threaded discussion had been enriched, due to more chances being offered to the participants to exchange knowledge and debate with one another. Presented below is the example 4.4.3.2. It is extracted from the SLA 1 threaded discussion transcript.

Example 4.4.3.2 extracted from the SLA 1 threaded discussion transcript

I somehow disagree with the above notion that motivational as well as self-confidence factor have a direct impact on the amount of input that the learners received. <C+>(Critical assessment or evaluation of own or others'

contributions), <R+>(Relevant statement).While it might be true in some cases that learners with higher level of motivation are more likely to succeed in language learning, but there are also cases where the quiet observant learner may also have greater success.<R+>(Relevant statement),<I+>(Important statement),<OE+>(Drawing on personal experience), <NL+>(Learner brings new things in) ,<JP+>(Providing proof or examples),<C+>(Critical assessment or evaluation of own or others' contributions) ,<AC+>(Clear, unambiguous statement),<W+>(Widen discussion) ,<P+>(Discuss practical utility of new ideas). As such, i believe that this has more to do with performance than learning. <R+>(Relevant statement) ,<JS+>(Justifying solutions or judgments) ,<OE+>(Drawing on personal experience),<C+>(Critical assessment and evaluation of own or others' contributions).,<NL+>(Learner brings new things in),<AC+>(Clear, unambiguous statement),<P+>(Discuss practical utility of new ideas).For instance, a confident language learner might perform well in oral tasks but not necessarily good in other aspects of language learning such as writing and listening. <JP+>(Providing proof or examples),<R+>(Relevant statement),<I+>(Important statement), <OE+>(Drawing on personal experience),<AC+>(Clear, unambiguous statement),<W+>(Widen discussion) Therefore, to say that extroverted learners are able to absorb more input than introverted ones would be too simplistic a view.<R+>(Relevant statement) ,<OE+>(Drawing on personal experience),<NL+>(Learner brings new things in),<L+>(Generating new data from information collected), <AC+>(Clear, unambiguous statement),<W+>(Widen discussion),<I+>(Important statement).

It might be true that anxiety can play a negative role in language learning but only to the extent that it interferes with the learning process. <C+>(Critical

assessment or evaluation of own and others' contributions), <NL+>(Learner brings new things in),<P+>(Discuss practical utility of new ideas) ,<R+>(Relevant statement),<W+>(Widen discussion), <I+>(Important statement),<AC+>(Clear, unambiguous statement). Experiencing anxiety before an oral presentation for instance, can provide the right combination of motivation and focus to succeeed on the task. <JP+>(Providing proof or examples), <R+>(Relevant statement), <AC+>(Clear, unambiguous statement), <C+>(Critical assessment or evaluation of own or others' contributions) , <P+>(Discuss practical utility of new ideas), <OE+>(Drawing on personal experience) ,<W+>(Widen discussion),<NL+>(Learner brings new things in)..Knowing that you are not good at something would propel you to put in more effort into it. <C+>(Critical assessment or evaluation of own or others' contributions), <JP+>(Providing proof or examples),<R+>(Relevant statement),<AC+>(Clear, unambiguous statement),<P+>(Discuss practical utility of new ideas), <OE+>(Drawing on personal experience), <W+>(Widen discussion). Nevertheless, there are also individuals who, as a result of anxiety, shy away from the process of language learning. <C+>(Critical assessment or evaluation of own or others' contributions), <JP+>(Proving proof or examples), <R+> (Relevant statement), <P+> (Discuss practical utility of new ideas), <OE+>(Drawing on personal experience),<W+>(Widen discussion), <AC+>(Clear, unambiguous statement).These are the learners who are unable to channel their anxiety as a form of motivation thus, rejecting the learning situation presented. <JP+>(Proving proof or examples), <C+>(Critical assessment or evaluation of own or others' contributions),<R+>(Relevant statement),<P+>(Discuss practical utility of new ideas),<OE+>(Drawing on personal experience),<W+>(Widen discussion),<AC+>(Clear, unambiguous

statement). In short, it is an overgeneralization to say that anxiety is always a bad thing as it partly depends on how the individual learners respond to it.<C+>(critical assessment or evaluation of own or others' contributions), <R+>(Relevant statement) ,<I+>(Important statement),<NL+>(Learner brings new things in),<P+>(Discuss practical utility of new ideas),<W+>(Widen discussion),<OE+>(Drawing on personal experience), <JS+>(Justifying solutions or judgments), <L+>(Generating new data from information collected).

Based on example 4.4.3.2, it is clear that the participant disagreed with Krashen in terms of learners with higher motivation tend to receive more input than those who have lower motivation. According to her argument, this is because if extrovert learners, who were deemed as having higher motivation than introvert learners, as having to receive more input , then extrovert learners should have outperformed introvert learners in every type of task. However, based on the participant's observation as a second language teacher, this was not true as introvert learners might also outperform extrovert learners in certain tasks such as writing and listening tasks.

Relating to anxiety issue, based on her own experience as a second language teacher and also as a teacher, the participant agreed that anxiety may be harmful to some learners to a certain extent. However, anxiety could play an important role in motivating learners to strive harder in order to success. Thus, the participant stressed that the way one perceived and reacted with anxiety was important as it would determine whether the anxiety did good or bad to them.

Referring to Table 4.14 where negative criticalness is concerned, W- (Narrowing the discussion) and JS- (Unjustified statements) are the two most frequently found uncritical thinking indicators which share the same percentage value that is 0.39%. A-

(Confuse statements), L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments), I- (Unimportant or trivial statements) and N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution) indicators also share the same value that is 0.33%. The least found uncritical thinking indicators are R- (Irrelevant statements) at 0.26%, C- (Uncritical acceptance or unreasoned rejection) at 0.20%, O- (Squashing attempts to bring in outside knowledge or sticking to prejudices or assumptions) at 0% and P- (Discuss in a vacuum) at 0%. Those statements which were coded as A- (Confuse statements), C- (Uncritical acceptance or unreasoned rejection), N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution,) L-(Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments), and JS- (Unjustified statements) were assigned the code W- (Narrowing the discussion) as well, rendering W- (Narrowing the discussion) percentage value was higher than the other uncritical thinking categories. This is because the coder perceived that the instances of A- (Confuse statements), C- (Uncritical acceptance or unreasoned rejection), N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution), L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments), and JS- (Unjustified statements) limited the overall discussion. JS- (Unjustified statements) were assigned to those instances where the participants failed to use sound reasons or other valid evidences to support their arguments. Presented below is the coding example 4.4.3.3 assigned with negative critical thinking indicators extracted from the SLA 1 threaded discussion transcript.

Example 4.4.3.3 extracted from the SLA 1 threaded discussion transcript:

As anxiety is the source of motivation, so do these things are the source for anxiety to occur in students' learning. It can be simplified through this chain: Types of task and skill required from students to perform, learning and integration-Anxiety-Motivation-Input <AC->(Confused statement), <R->(Irrelevant statement), <P->(Discuss in vacuum), <NI->(False or trivial leads).

With reference to example 4.4.3.3 above, the participant's statements were coded as not clear in meaning or as confuse statement <AC->. This resulted in them to be coded also as irrelevant <R->, out of topic <P-> and as false lead <NI->. Table 4.15 below presents the critical thinking ratio for each critical thinking category.

Indicators	Critical Thinking Ratio
Relevance (R)	0.973
Importance (I)	0.818
Novelty (N)	0.960
Outside knowledge/experience (O)	1.000
Ambiguities (A)	0.966
Linking Ideas (L)	0.928
Justification (J)	0.920
Critical Assessment (C)	0.929
Practical Utility (P)	1.000
Width of understanding (W)	0.905

Table 4.15: Critical Thinking Ratio of the SLA 1 Threaded Discussion

Based on table 4.15, in general, the ratio for each critical thinking indicator is quite high. This indicates that the participants were able to perform well in each aspect of critical thinking. The lowest ratio is 0.818 which belongs to I (Importance) indicator. The highest ratio was 1 which belongs to both O (Bringing in outside knowledge/ experience to bear on the problem) and P (Practical Utility) indicators. The ratio values of the other critical thinking indicators fall within the range of 0.90 to 0.97.

In the following section, the results of the SLA 2 threaded discussions were presented. SLA 2 topic of threaded discussion focused on another theory of second language acquisition which is known as sociocultural theory. SLA 2 offered a premise regarding the practice of sociocultural theory in second language learning context and it required the participants to state how far they agreed with the premise.

4.3.4 Results and Discussion of the SLA 2 Threaded Discussion

The SLA 2 topic of threaded discussion is presented in Appendix B (II). The frequency and percentage for each of the positive and negative critical thinking indicator sub categories detected in the SLA 2 threaded discussion are tabulated. The results are demonstrated in Table 4.16 and Table 4.17.

Positive Indicators	AC+	C+	I+	JS+	L+	N+	O+	P+	R+	W+	Total
Frequency	130	20	29	45	55	91	45	37	130	54	636
Percentage %	19.58	3.01	4.37	6.78	8.28	13.71	6.78	5.57	19.38	8.13	95.79

Table 4.16: The Frequency and Percentage of Positive Critical Thinking Indicator Sub Categories of the SLA 2 Threaded Discussion

Negative Indicators	AC-	C-	I-	JS-	L-	N-	O-	P-	R-	W-	Total
Frequency	4	2	1	3	4	2	0	5	4	3	28
Percentage %	0.60	0.30	0.15	0.45	0.60	0.30	0	0.75	0.60	0.45	4.2

Table 4.17: The Frequency and Percentage of Negative Critical Thinking Indicator Sub Categories of the SLA 2 Threaded discussion

Based on Table 4.16 and Table 4.17, it is apparent that, generally, the percentage of positive criticalness (95.79%) is higher than the percentage of negative criticalness (4.2 %). There were 636 occurrences of positive criticalness and 28 occurrences of negative criticalness spotted in the transcript.

Where the positive criticalness of SLA 2 threaded discussion is concerned (See Table 4.16), both R+ (Relevant statements) and AC+ (Clear and Unambiguous statements) indicators show the same percentage value that is 19.58%, followed by N+ (Novelty) indicator at 13.71% and L+ indicator (Linking of ideas and generating new data from information collected) at 8.28%, rendering the four of them to be the four most frequently detected indicators while the least detected indicators are C+ (Critical assessment of others' and own contribution) at 3.01%, followed by I+ (Important points) at 4.37% and P+ (Discussing the practicality of new ideas and suggesting solutions) at 5.57%. These findings indicate that the participants were able to produce relevant and clear statements, bring in novel ideas and link ideas and create new interpretation. However, similar with the findings in Table 4.13, their lack of competence in incorporating important input, suggesting solutions and critiquing their peers' contributions was again recognized when the P+ (Discussing the practicality of new ideas and suggesting solutions), I+ (Important points) and C+ (Critical assessment of others' and own contribution) indicators are found as the three least detected indicators. This is probably because the topic of discussion was not designed for problem solving

and it did not require participants to suggest solutions and discuss the practicality of each solution. In addition, the low percentage value of C+ (Critical assessment of others' and own contribution) also suggested that the participants did not engage much in reflecting and commenting on their peers' comments critically. They simply agreed to what others said without further probing or providing reasons for their stance of agreeing to their peers' postings. Presented below is the coding example 4.4.4.1 which was assigned with positive critical thinking indicators. It is extracted from the SLA 2 threaded discussion transcript.

Example 4.4.4.1 extracted from the SLA 2 threaded discussion transcript

Yes, I am with you so far, grammar for me is somehow the basic and if the basic is not there, what comes after is most probably not strong enough.<C+>(Critical assessment or evaluation of own or others' contributions), <NQ+>(Welcoming new ideas), <OQ+>(Welcoming outside knowledge). But I also believe that accuracy and fluency should come hand-in-hand. <R+>(Relevant statement), <NI+>(New ideas for discussion), <L+>(Generating new data from information collected)..There are no certain rules which state that accuracy is more vital than fluency and vice versa.<JS+>(Justifying solutions or judgments), <R+>(Relevant statement), <OK+>(Using previous knowledge), <NI+>(New ideas for discussion). But then of course, to keep these in balance would be the major challenge for both teachers and students.<P+>(Discuss practical utility of new ideas), <NI+>(New ideas for discussion), <W+>(Widen discussion), <I+>(Important statement), <R+>(Relevant statement), <L+>(Generating new data from information collected).

With reference to example 4.4.4.1, it is noted that the participant agreed with others' viewpoints after pondering on it critically <C+>. She also justified her own stance by

inserting relevant <R+>, justified, <JS+>, important <I+>, new generated interpretation <L+>. Her statements were also coded as new problem related information brought in by the participant <NI+>. Her attempt to bring in new inputs showed that she welcomed outside and new knowledge <OQ+>, <NQ+> as she had responded to others' viewpoints critically. Furthermore, the participant also discussed the practicality of emphasizing equally on both fluency and accuracy <P+> by suggesting that it might be a tedious task for the teachers.

In general, participants agreed that sociocultural theory founded by Vygotsky has gained its popularity in second language teaching and learning context. Once again, their discussion was grounded on their own experience as second language learners and also for some participants, as second language teachers. In addition, they also discussed the practicality of this theory. Sociocultural theory stresses on the importance of social interaction as it brought about learning. The participants related the practice of sociocultural theory with the application of communicative approach. They pondered on and discussed both the wanted and unwanted effects resulted from the application of this theory in second language classrooms. From there, several issues branched out. One of the issues was about the acquisition of fluency and accuracy. The other matters being raised during the threaded discussion session were concerned with that of error correction, the teaching and learning of grammar rules and also the students' needs. Presented below is the example 4.4.4.2. It is extracted from the SLA 2 threaded discussion transcript.

Example 4.4.4.2 extracted from the SLA 2 threaded discussion transcript

Re: E-Forum 2 (11 - 31 March)

By XXX.?- Saturday, 19 March 2011, 11:39 PM

However, sociocultural perspective assumes that cognitive processes begin as an externally socially mediated activity and eventually becomes internalized. (R+)(Relevant statement),(AC+)(Clear, unambiguous statement), (NL+)(Learner brings new things in), (C+)(Critical assessment or evaluation of own or others' contributions), (I+)(Important statement), (JS+)(Justifying solutions or judgments), (NP+)(New problem-related information), (OK+(Using previous knowledge),(P+)(Discuss practical utility of new ideas),(W+)(Widen discussion).The harmful effect of this is that it could lead to fossilization.(P+)(Discuss practical utility of new ideas), (R+)(Relevant statement), (AC+)(Clear, unambiguous statement),(NL+)(Learner brings new things in),(NP+(New problem-related information),(W+)(Widen discussion).It is almost impossible for the teachers to correct every children's error in every speaking activities.(JS+(Justifying solutions or judgments,) (W+)(Widen discussion),(R+)(Relevant statement), (AC+)(Clear, unambiguous statement).Lack of monitoring from the teachers could result in this perspective to be backfired.(JS+)(Justifying solutions or judgments),(NS+)(New solutions to problem),(P+)(Discuss practical utility of new ideas),(W+)(Widen discussion),(R+)(Relevant statement),(AC+)(Clear, unambiguous statement). I've seen enough second language learners who are very fluent in speaking but lack the accuracy.(OE+)(Drawing on personal experience),(JS+)(Justifying solutions or judgments),(W+(Widen discussion),(R+)(Relevant statement),(AC+)(Clear, unambiguous statement).Therefore, i believe that this premise is agreeable but only to a certain extent unless the teachers are willing to work as hard as the children.(P+)(Discuss practical utility of new ideas),(W+)(Widen discussion),(R+)(Relevant statement),(AC+)(Clear, unambiguous statement).

With reference to example 4.4.4.2, the participant brought up the error correction and fossilization issues. The participant cautioned the practitioners of sociocultural perspective against the unwanted effect. The participant pointed out that fossilization might arise if the teachers did not monitor the students. According to the participant, this might eventually produce second language learners who were fluent but not accurate speakers of the target language.

By comparing the results demonstrated in Table 4.16 and Table 4.17 with the results shown in Table 4.13 and Table 4.14, it is noted that the percentage of positive criticalness found in the SLA 2 threaded discussion transcript is lower than the one found in the SLA 1 threaded discussion transcript. On the other hand, where percentage of negative criticalness is concerned, another point to note is that the percentage of negative criticalness found in the SLA 2 is higher than the percentage value detected in the SLA 1 threaded discussion transcript. Although I+ (Important points), P+ (Discussing the practicality of new ideas and suggesting solutions) and C+ (Critical assessment of others' and own contribution) indicators are the least frequent indicators for both the SLA 1 and SLA 2, when the individual indicator percentage value is concerned, both I+ (Important points) at 4.37% and P+ (Discussing the practicality of new ideas and suggesting solutions) at 5.51% percentage values of the SLA 2 are higher than the I+ (Important points) at 2.63% and P+(Discussing the practicality of new ideas and suggesting solutions) at 1.05% percentage values of SLA 1 threaded discussion, while C+ (Critical assessment of others' and own contribution) percentage value of SLA 2 at 3.01% is lower than the C+ (Critical assessment of others' and own contribution) percentage value of SLA 1 at 5.32% threaded discussion. The surge in P+ (Discussing the practicality of new ideas and suggesting solutions) percentage of SLA 2 threaded discussion may be due to the nature of the topic of threaded discussion. In SLA 2 threaded discussion, the participants discussed the practicality of the practice of

sociocultural theory in second language learning context and they also suggested some aspects that should be taken into consideration when applying sociocultural theory in the second language classrooms. (See the example 4.4.4.1 and 4.4.4.2 above) The lower percentage of C+ (Critical assessment of others' and own contribution) of the SLA 2 as compared with the SLA 1 signals the decline in the participants' engagement in evaluating their peers' comments. In addition, the percentage values of N+ (Novelty), L+ (Linking of ideas and generating new data from information collected), JS+(Justified statements) and O+ (Referring to outside knowledge/experience) of SLA 2 threaded discussion are also lower than that of SLA 1 threaded discussion. For instance, the percentage of JS+ (Justified statements) for SLA 1 is 9.19% while the percentage of JS+ (Justified statements) for SLA 2 is 6.78%. In addition, the percentage of N+ (Novelty) for SLA 1 is 16.21% while only 13.71% of N+ (Novelty) was recorded for SLA 2. The differences found in the percentage values imply that the participants had made lesser justification and brought in lesser novel ideas into the SLA 2 threaded discussion session. These may be caused by the participants' inability to think of reasons or examples to support their own arguments or to rebut others' arguments. It seems that the interest of participants in participating in threaded discussion was also diminishing gradually because the SLA 2 topic of threaded discussion was the shortest threaded discussion as compared to the other three threaded discussions. As cited by Nandi, Chang and Balbo (2009), Gerbic (2006) and Weaver (2005) had identified several factors that may affect the motivation of students to participate in online discussion. The factors identified were the participants' interest in the topic of discussion, feedback from instructors and the opportunity to exchange opinions among themselves. So, when it came to the discussion of the topic no.4, the motivation of participants of this study may decline gradually due to their reduced interest in the topic of discussion, causing it to be shortest discussion. The lack of interest, followed by the lack of motivation to

participate in threaded discussion, may be also the reasons why the participants overall critical thinking performance dropped in the SLA 2 threaded discussion as compared to the SLA 1 threaded discussion.

Referring to Table 4.17, it is noted that where the negative criticalness of the SLA 2 threaded discussion is concerned, the percentage of the indicators are P- (Discuss in vacuum) at 0.75%, L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments) at 0.60%, A- (Confuse statements) at 0.60%, and R- (Irrelevant statements) at 0.60% are the four most frequent negative critical thinking indicators found in SLA 2 threaded discussion transcript. The least detected negative critical thinking indicators are I- (Unimportant or trivial statements) at 0.15%, C- (Uncritical acceptance or unreasoned rejection) at 0.30% , and N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution) at 0.30%. One possible reason is the way the coder coded the transcripts. The P- (Discuss in vacuum) instances were made up by those statements that were out of topic or ambiguous in meaning, rendering them to be coded as A- (Confuse statements) and R-(Irrelevant statements) as well. Some statements assigned with L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments) were those also assigned with C- (Uncritical acceptance or unreasoned rejection) and JS- (Unjustified statements) codes. According to Newman et.al. (1995) content analysis framework, there were two conditions where L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments) code can be assigned to the statements. The first condition is when the statement was found to be repeating the old information without making inferences or offering an interpretation.

The second condition is when it stated that one shared the ideas and opinions stated, without adding any personal comments or new interpretations. As compared with the results tabulated in Table 4.14, generally, the similarity found between the coding for the SLA 1 and SLA 2 is the zero percentage of O- (Squashing attempts to bring in outside knowledge or sticking to prejudice or assumptions) recorded. The percentage values of the following indicators namely the A- (Confuse statements) at 0.60%, C- (Uncritical acceptance or unreasoned rejection) at 0.30%, P- (Discuss in vacuum) at 0.75%, R- (Irrelevant statements) at 0.60%, L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments) at 0.60%, JS- (Unjustified statements) at 0.45% and W- (Narrowing the discussion) at 0.45% of the SLA 2 threaded discussion are higher as compared to percentage value of each indicator namely the A- (Confuse statements) at 0.33%, C- (Uncritical acceptance or unreasoned rejection) at 0.20%, P-(Discuss in vacuum) at 0%, R-(Irrelevant statements) at 0.26%, L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments) at 0.33%, JS-(Unjustified statements) at 0.39%, and W- (Narrowing the discussion) at 0.39% of the SLA 1 threaded discussion. However, the percentage values for I-(Unimportant or trivial statements) and N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution) indicators are lower in SLA 2 threaded discussion as compared to SLA 1 threaded discussion. Referring to Table 4.17 the percentage value for I- indicator is 0.15 while the percentage value for N- (Repeating what has been said, or false or trivial leads, or accepting first offered solution indicator) is 0.30. On the other hand, based on Table 4.14, I-(Unimportant or trivial statements) and N-(Repeating what has been said, or false or trivial leads, or accepting first offered solution) indicators share the same

percentage value that is 0.33. Presented on the next page is the coding example 4.4.4.3 which was assigned with negative critical indicators. It is extracted from the SLA 2 threaded discussion transcript.

Example 4.4.4.3 extracted from the SLA 2 threaded discussion transcript

Having said that,I guess that as long as learners are indulged in real life communication, accuracy or fluency may not be the case. <AC->(Confused statement), <JS->(Offering judgements or solutions without explanation or justification)

Referring to example 4.4.4.3, the participant's statement was assigned as not clear in meaning <AC->. This was due to the fact that no further justification provided <JS-> by the participant as to what had made her think that accuracy or fluency may not be the case as long as learners were engaged in real life communication.

Table 4.18 below again presents the critical thinking ratio for each critical thinking indicator. In general, the ratio for each critical thinking indicator is quite high. This indicates that the participants were able to perform well in each aspect of critical thinking. The smallest ratio is 0.762 which belongs to P (Practical Utility) indicator. The highest ratio is 1 which belongs to O (Bringing in outside knowledge/ experience to bear on the problem). The ratios of the other critical thinking indicators fall within the range of 0.81 to 0.97. The subsequent section will describe the observation obtained after comparing the frequencies of both positive and negative critical indicators of all the four topics of threaded discussion.

Indicators	Critical Thinking Ratio
Relevance (R)	0.941
Importance (I)	0.933
Novelty (N)	0.896
Outside	1.000

knowledge/experience (O)	
Ambiguities (A)	0.970
Linking Ideas (L)	0.833
Justification (J)	0.957
Critical Assessment (C)	0.818
Practical Utility (P)	0.762
Width of understanding (W)	0.895

Table 4.18: Critical Thinking Ratio of the SLA 2 Threaded Discussion

4.3.5 Comparison of Results among the Four Threaded Discussion Transcripts

After inspecting Tables 4.7, 4.10, 4.13 and 4.16 , it is found that all the participants seemed to have less problems in contributing inputs that were assigned codes R+ (Relevant statements), AC+ (Clear and unambiguous statements), N+ (Novelty), JS+ (Justified statements), L+ (Linking of ideas and generating new data from information collected) and O+ (Referring to outside knowledge/experience). Interestingly, it is also noted that none of O- (Squashing attempts to bring in outside knowledge or sticking to prejudice or assumptions) input is detected in the four threaded discussion transcripts and this causes all the four threaded discussion transcripts to have ratio 1 for their O (Bringing in outside knowledge and experience) indicator. Both the O+ (Referring to outside knowledge/experience) percentage for the SLA 1 and SLA 2 threaded discussions are also higher than that of the RM 1 and RM 2 threaded discussions. This may be due to the nature of topic. The characteristics of both the SLA 1 and SLA 2 topics of threaded discussion seem to encourage the participants to bring in more of their own previous experience and background knowledge and also draw in more related outside materials to substantiate their arguments. The participants also proved

that they had been able to integrate their previous experience and background knowledge into the threaded discussion. This is probably because most of the participants were exposed to the second language acquisition theories during their undergraduate study. Therefore, it was easier for them to add in their background knowledge and experience and include other relevant materials they gained from books, articles and internet into both the SLA 1 and SLA 2 threaded discussions. On the other hand, the participants who participated in Research Methodology course threaded discussion sessions did not have enough experience pertaining to the writing literature review and also the conduct of an interview. This is because the research methodology course is an introductory course which is designed to expose the postgraduate students who are novice with regard to the important concepts of research. The importance of being able to locate and insert relevant information, be it taken from the outside materials such as books, personal experience or previous knowledge into the threaded discussion was highlighted by Woo and Wang (2009) in their study. Woo and Wang (2009) conducted a study to find out whether web blogging was effective in encouraging critical thinking. They were also interested in investigating the influence of different kind of blogging topic has on the overall results of the frequency of each critical thinking indicator. Their participants were secondary school students. The three topics of web blogging were designed based on secondary school History subject syllabus. The framework they used to code their web blogging transcripts was similar to the one employed by the current researcher which was known as the Newman et.al (1995) content analysis framework. They designed three topics for students to discuss in total. The similarity found among the three threaded discussions' findings was that R+ (Relevant statements), O+ (Referring to outside knowledge/experience) and JS+ (Justified statements) indicators were the three most frequent detected critical thinking indicators in all the three web blogging transcripts. They also claimed that because the

topic 1 and topic 3 allowed the students to use the information from the textbooks to substantiate their arguments, the C- (Uncritical acceptance or unreasoned rejection) percentage reported was insignificant as it was too small a value. On the other hand, topic 2 which was designed in such a way that the participants could not rely solely on the textbook information to support their arguments, the overall negative criticalness of topic 2 increased and C-(Uncritical acceptance or unreasoned rejection) indicator percentage became significant.

The same phenomenon is observed in the findings of this present study. In the data of this study, it is noted that while the percentage of O+ (Bringing in outside knowledge/experience to bear on the problem) indicator in both the SLA 1 and SLA 2 threaded discussions are higher than that of the RM 1 and RM 2 threaded discussions, the percentage of C- (Uncritical acceptance or unreasoned rejection) indicator for both the SLA 1 and SLA 2 threaded discussions are lower than that of the RM 1 and RM 2 threaded discussions. These findings again show that being able to include relevant outside materials into the threaded discussion could be a crucial key to improve the participants' overall critical thinking performance.

With regard to the ratio of O (Referring to outside knowledge/experience) of this study, the O (Referring to outside knowledge/experience) ratio for all four threaded discussion is 1. This resembled the result reported in Song and Chan (2009) study. In their study, their participants were required to participate in four topics of online discussion. In their findings, they stated that O (Referring to outside knowledge/experience) indicator ratio was found to be the highest in all four online discussion transcripts. In addition, the R+ (Relevant statements) and I+ (Important points) indicators were said to be consistently exhibited throughout the four topics of online discussion. This was because it seems that the number of statements coded under R+ (Relevant statements) and I+ (Important points) indicator did not differ greatly throughout the four topics of online discussion.

Song and Chan (2009) also further stated that there was improvement found in the critical thinking ratio of each critical thinking indicator as their participants progressed from topic no.1 to topic no.3. However, when it came to topic no.4 threaded discussion, the critical thinking ratio of each critical thinking indicator dropped and from the comments they gathered from their participants, the researchers attributed the poor performance in topic 4 to ill-structured topic of discussion and time constraint faced by their participants. In terms of time constraint, the researchers pointed out that at the time topic no.4 was set for discussion, it was near the end of semester and at that period of time, their participants had to rush in finishing and submitting the other assignments. This probably caused them to contribute less quality input in topic no. 4 threaded discussion. This seems to imply that the timing concerning when online discussion task was launched may likely to affect the overall participants' critical thinking performance in threaded discussion. In this study, after looking at the average of the critical thinking ratio for both the SLA 1 and SLA 2 threaded discussions, when participants from Second Language Acquisition course progressed from the SLA 1 threaded discussion to the SLA 2 threaded discussion, it is noted that there was a slight drop in their overall critical thinking performance. The reason may be similar to the one stated by Song and Chan (2009) in that time constraint became a problem faced by the participants. This is because the SLA 2 threaded discussion task was assigned during the end of the semester. It was the time where the participants were rushing to meet the deadlines of the other courses' assignments. This seems to imply that the timing concerning when online discussion task was launched may likely to affect the overall participants' critical thinking performance in threaded discussion.

For this study, another similarity identified throughout the four topics of threaded discussion transcripts was C+ (Critical assessment of others' or own contribution) indicator was recognized as one of the least detected indicators in all the four threaded

discussion transcripts. This may suggest that overall participants did not engage much in evaluating their peers' postings critically. This same phenomenon was also observed and reported by Irfan and Noor Hazita (2010) who examined the trainee teachers' online discussion forum transcripts with the aim of finding out the positive critical thinking and negative critical thinking indicators that were exhibited. As mentioned by Irfan and Noor Hazita (2010), the subjects of their study were the trainee teachers who were all novice when it came to teaching. In other words, they did not have any teaching experience prior to their teaching practice. The online discussion forum was launched during their teaching practice in order for them to interact with their peers and lecturer by sharing and discussing the problems they encountered during teaching practice. One of their findings was that C+ (Critical assessment of others' or own contribution) indicator was one of the six least found positive critical thinking indicators, rendering them to assert that their subjects of study might be weak in their ability to evaluate their peers' and their own postings critically and the researchers posited that this was probably caused by their lack of real life teaching experience.

In short, the outcome of the assessment based on the Newman et.al (1995) content analysis framework which was designed to measure critical thinking is presented and discussed in the section above. The outcome of the assessment includes both the critical thinking performance in terms of the score of each positive and negative critical thinking indicator of each topic of threaded discussion and also the critical thinking ratio of each broad critical thinking category. The following chapter will outline the results and discussions of research question 3.

CHAPTER 5: FINDINGS AND DISCUSSION IN RELATION TO THE RELATIONSHIP BETWEEN THE USE OF COHESIVE DEVICES AND CRITICAL THINKING

5.1 Introduction

In the preceding chapter, the results and discussion of the research question 1 and research question 2 were outlined. In this chapter, the results and discussion of the research question 3 of this study will be presented.

5.2 Results of Research Question 3

Research Question 3

How does the use of cohesive devices reflect the participants' critical thinking?

As aforementioned, according to Halliday and Hasan taxonomy of grammatical cohesion (1976), there are four types of cohesive devices, namely *reference, substitution, ellipsis and conjunction* which can be employed to create grammatical cohesion within a text. The researcher will focus on the four cohesive devices in order to answer the research question 3. The researcher will look at the use of the first personal singular pronoun 'I' in the context of threaded discussion, followed by the use of substitution, ellipsis and conjunction and how the use of the four cohesive devices might reflect critical thinking. In the subsequent section, the coding results and the discussion of the coding results belong to the first personal singular pronoun 'I' will be presented.

5.2.1 The first personal singular pronoun 'I'

The three most frequently detected personal pronouns in the data of this study are the pronouns 'I', 'you' and 'we'. The pronoun 'I' scored the highest frequency of use among the three. As mentioned by Baron (2010), in computer mediated communication, such as threaded discussion, it is normal to find that the first and second pronouns are both high in frequency. This is because computer mediated communication, such as threaded

discussion, resembles the feature of the spoken discourse where pronouns are used heavily. According to Garrison et.al (2000), the use of pronoun 'we' which functions as an inclusive pronoun and the pronoun 'you' which functions as vocative contributed to the construction of social presence in the online learning world and the use of both pronouns is the indicator of social presence. For instance, the pronoun 'we' was used in the context where the author assumes the whole group of the online learning participants is sharing the same viewpoint as him regarding the matter under discussion and this enhances the group cohesion of online learning environment (Garrison et.al. , 2000).Since the focus of this study is on critical thinking which is associated with cognitive presence (Garrison et.al 2000), and pronoun 'I' is widely used to indicate cognitive presence when expressing viewpoints, this prompted the researcher of this study to only look at the use of the first personal singular pronoun 'I' in the context of threaded discussion and the way it might reflect the critical thinking. The researcher decided to disregard the use of the other two pronouns 'you' and 'we'. The reason being the use of pronouns 'you' and 'we' is closely linked to social presence and not cognitive presence. Table 5.1 (on the next page) shows the frequency and percentagevalue of each of the positive critical thinking indicators assigned to the first personal singular pronoun 'I' instances.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	372	194	312	343	155	160	250	372	181	247	2586
Percentage ofeach positive critical thinking indicators	14.39	7.5	12.06	13.26	6.0	6.19	9.67	14.39	7.0	9.55	100

Table 5.1: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the First Personal Singular Pronoun "I" Instances

Table 5.1 above shows the positive critical thinking indicators coding results of sentences where the first personal singular pronoun 'I' was detected from each threaded discussion transcript. In general, the sentences where 'I' appeared were frequently coded as R+ (Relevant statements) at 14.39%, AC+ (Clear and unambiguous statements) at 14.39%, O+ (Referring to outside knowledge/experience) at 13.26%, N+ (Novelty) at 12.06% and C+ (Critical assessment of others' or own contribution) at 9.67%. The five least detected positive critical thinking indicators in the sentences where 'I' was used are I+ (Important statement) at 7.50%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 6.0%, JS+ (Justification) at 6.19% and L+ (Linking of ideas and generating new data from information collected) at 7.0 % and W+ (Widen the discussion) at 9.55%. These findings suggest that the use of the first personal singular pronoun 'I' may likely indicate the presence of the relevant (R+), clear (AC+) and novel ideas (N+) being brought into the threaded discussion. The instances where the first singular personal pronoun 'I' was found are likely to be used to depict the personal experience and knowledge of the participants (O+) shared which were deemed relevant to the topic of discussion. Besides that, some of the instances where the first

personal singular pronoun 'I' was found were also the outcome of critical assessment of others' and own contributions (C+) towards the threaded discussion. Contributions here can be comments, opinions, disagreements, agreements or information gathered from outside source such as books and article. Example 5.2.1.1 below presents the instance of the pronoun 'I' where positive critical thinking indicators were assigned. It is extracted from the SLA 1 transcript.

Example 5.2.1.1 extracted from SLA 1 transcript

I somehow disagree with the above notion that motivational as well as self-confidence factor have a direct impact on the amount of input that the learners received (C+, R+, W+, L+, AC+). While it might be true in some cases that learners with higher level of motivation and self- confidence are more likely to succeed in language learning, but there are also cases where the quiet observant learner who seems to be lack of motivation and self -confidence may also have greater success. (JP+, R+, I+, OE+, L+, C+, NL+, AC+)

In the example above, the first personal singular pronoun 'I' was used to express disagreement by the participant. She disagreed with the notion stating that motivational as well as self- confidence factors would impact the amount of input a learner received. She further justified her disagreement by providing proof that some learners who were quiet observers in class can also excel in their learning of a second language. Her disagreement together with justification caused the instance of pronoun 'I' to be coded as C+ (critical assessment of others' and own contributions), R+ (Relevant statement), AC+ (Clear and unambiguous statement), W+ (Widen the discussion) and L+ (Generating new information from data collected).

Example 5.2.1.2 extracted from SLA 1 transcript

*When **I** first attended my third language class, I was extremely drowned with*

*anxiety. (OE+, R+, NL+ AC+).**I** did not participate much because**I** did not have much knowledge about the subject matter (JS+, R+, OE+, AC+, W+ and NL+).*

The first personal singular pronoun 'I' appeared four times in example 5.2.1.2 above. The pronoun 'I' was used to relate the personal experience the participant had in terms of the anxiety he faced and the reason that gave rise to his anxiousness when he attended the third language class. The first sentence where pronoun 'I' had been detected twice was coded as OE+ (Referring to personal knowledge/experience) , R+ (Relevant statement), NL+ (Learner brings in new information) and AC+ (Clear and unambiguous statement) The second sentence where 'I' had been detected twice was coded as JS+ (Justification), R+ (Relevant statement), OE+(Referring to personal knowledge/experience), AC+(Clear and unambiguous statement) , W+(Widen the discussion) and NL+ (Learner brings in new information).

Example 5.2.1.3 extracted from RM 2 threaded discussion

In Situation B, I think the interviewer did a good job in rephrasing the interviewee's statement. (R+)(Relevant statement), (I+) (Important statement),(AC+)(Clear, unambiguous statement,)(W+)(Widen discussion), (C+) (Critical assessment of other's or own contribution) .This allows the interviewee a chance to agree with his/her previous statement and the interviewer to truly understand what is articulated (JS+)(Justifying solution or judgments),(R+)(Relevant statement),(I+) (Important statement) (AC+)(clear, unambiguous statement).

In the example above, the first personal singular pronoun 'I' was used together with the mental verb 'think' by the participant to express her opinion regarding the interviewer's attempt in rephrasing the interviewee's statement. The participant praised the interviewer for rephrasing the interviewee's statement as she justified that by doing so,

it benefited both interviewee and interviewer eventually. The sentence where the phrase 'I think' had been found was assigned the codes R+ (Relevant statement), I+(Important statement), AC+(Clear, unambiguous statement), W+ (Widen the discussion)and C+ (Critical assessment of other's or own contribution).

Next, the results tabulated in Table 5.2 below will be discussed.

Negative critical thinking indicators	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
RM 1	0	1	1	0	0	0	1	0	1	1
RM 2	0	2	2	0	0	0	2	0	2	2

Table 5.2: The Frequency of Negative Critical Thinking Indicators Assigned to the First Personal Singular Pronoun "I" Instances

Table 5.2 above shows the negative critical thinking indicators coding results of sentences where the first personal singular pronoun 'I' was detected from each threaded discussion transcript. In the RM 1 transcript, there was one instance of the pronoun 'I' which indicated the presence of the negative critical thinking indicators and in the RM 2 transcript, there was also one instance of the pronoun 'I' which indicated the presence of negative critical thinking indicators. However, none of the instances of the pronoun 'I' in both the SLA 1 and SLA 2 transcripts were assigned with negative critical thinking indicators. Example 5.2.1.4 below shows the instance of the pronoun 'I' where negative critical thinking indicators were observed. It is extracted from the RM 2 transcript.

Example 5.2.1.4 extracted from RM 2 transcript

> *Your explanation was indeed clear...Thank You*
>
> *I agree to your opinion that in situation A that þrioritization of question is important' and perhaps the interviewee was facing time constraint. <L->(Stating that one shares the ideas or opinions stated, without taking these further or*

163

*adding any personal comments), <NS->(Accepting first offered solution), <C->(Uncritical acceptance or unreasoned rejection), <I-> (trivial statement)and <W->(Narrow the discussion). Besides, **I** also agree that one must not assume (layman term: put words into someone mouth, in asking for clarification. instead, the questions should be paraphrased. <L->(Stating that one shares the ideas or opinions stated, without taking further or adding any personal comments), <NS->(Accepting first offered solution), <C->(Uncritical acceptance or unreasoned refection),<I-> (trivial statement) and <W->(Narrow the discussion).*

With reference to example above**,** the participant used the personal pronoun 'I' to express agreement twice. However, it was found that the participant agreed to the other's viewpoint without elaborating further on why she agreed. This shows that the participant was uncritical when accepting other's viewpoint <C->. She also appeared to be accepting the first offered solutions to the problem <NS-> and she repeated the information found in previous posting without suggesting any new interpretation <L->. Agreeing to other's viewpoints without substantiating her stands caused her statements above to be marked as trivial statements (I-) and the trivial statements narrowed the overall discussion eventually (W-).

In the following section, the coding results and the discussions of the instances of substitution will be described.

5.2.2 Substitution

Table 5.3 below presents the positive critical thinking indicators coding results of substitution instances.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	10	9	8	6	2	6	6	10	8	8	73
Percentage of each positive critical thinking indicators	13.7	12.33	10.96	8.22	2.74	8.22	8.22	13.7	10.96	10.96	100

Table 5.3: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Substitution Instances

There were 4 instances of nominal substitution, 5 instances of verbal substitution and 1 instance of clausal substitution found in the data of this study. Based on Table 5.3 above, the sentences where substitution was found were frequently assigned R+ (Relevant statements) at 13.7%, AC+ (Clear and unambiguous statements) at 13.7%, N+ (Novelty) at 10.96% and I+ (important statement) at 12.33%, L+(Linking of ideas and generating new data from information collected) at 10.96% and W+(Widen the discussion) at 10.96% indicators. The four least detected positive critical thinking indicators in the sentences where substitution was used are O+ (Referring to outside knowledge/experience)at 8.22%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 2.74%, JS+ (Justification) at 8.22% and C+ (Critical assessment of others' or own contribution) at 8.22%. These findings indicate that the use of substitution cohesive device may relate to the production of relevant (R+), clear (AC+), important (I+), novel ideas (N+). These ideas could be the outcomes of the effort the

participants put in to generate new interpretation from their peers' previous postings (L+) and these ideas helped widen the scope of the threaded discussions (W+). Example 5.2.2.1 below presents the instance of nominal substitution where positive critical thinking indicators were assigned. It is extracted from the RM 1 transcript.

Example 5.2.2.1 extracted from RM 1 transcript

> *I do agree with it in that a literature review should include the previous studies in a critical way mentioning the strengths and the weaknesses. (R+, C+, I+, AC+) Moreover, a literature review should also distinguish between the previous studies and relate the most relevant **ones t**o the topic discussed in the present research (R+, I+, OE+, NS+, W+, AC+).*

The substituent here is 'ones'. 'Ones' acts as the substitute for the term 'previous studies'. The sentence where the substituent 'ones' had been detected was assigned the codes R+ (relevant statement), I+ (important statement), OE+ (Drawing on personal experience), NP+ (new problem related information), W+ (Widen the discussion) and AC+ (Clear and unambiguous statement). As for this example, the correct use of substituent 'ones' no doubt is important as it caused the sentence to be relevant (R+) and clear (AC+) in meaning. It is evident that the use of substitution in the data did not determine the assignment of other critical thinking indicators. Rather, it is the content of the sentences where substitution was found determined the assignment of other critical thinking indicators. For instance, the participant's choice of using substituent 'ones' here was not the only factor that caused this example to be awarded OE+ (Drawing on personal experience) and NP+ (new problem related information) indicators. In fact, it was the content tried to be conveyed by this instance that caused it to be viewed as personal experience (OE+) and also as new problem related information (NP+).

In the following section, the coding results and the discussions of the instances of

ellipsis will be presented.

5.2.3 Ellipsis

Table 5.4 below presents the positive critical thinking indicators coding results of ellipsis instances.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	3	2	3	1	0	2	1	3	3	3	21
Percentage of each positive critical thinking indicators	14.29	9.52	14.29	4.76	0	9.52	4.76	14.29	14.29	14.29	100

Table 5.4: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Ellipsis Instances

There were two instances of nominal ellipsis and one instance of clausal ellipsis found in the data of this study. Based on Table 5.4, it seems that all the three instances of ellipsis conveyed relevant (R+), clear (AC+), novel (N+) ideas which arose from the participants' attempts in generating new interpretation from information (L+) they obtained from their peers' postings. The relevant (R+), clear (AC+) and novel(N+) ideas helped widen the scope of discussion (W+) as they enriched the content of the threaded discussion. It was also found that the three ellipsis instances did not exhibit the P+ (Discussing the practicality of new ideas and suggesting solutions) critical thinking characteristic. Example 5.2.3.1 (See next page) presents the instance of nominal ellipsis where positive critical thinking indicators were assigned. It is extracted from the SLA 1 transcript.

Example 5.2.3.1 extracted from SLA 1 transcript

I have to agree with you that on the notion that assessments presented in both L1
and L2 learning situations are not very much different from one another. (R+, I+,
*AC+, C+).***Both** *would require the learners to perform orally or in written forms.*
(JS+, R+, I+, L2+, NL+, C+,OE+, AC+)

Example 5.2.3.1 shows the instance of nominal ellipsis where 'Both' functioned as the head of the elliptical nominal group. The head noun that was repudiated was 'the assessments presented in L1 and L2' presupposed from the preceding sentence. The sentence where 'Both' was found was assigned the codes JS+ (Justification), R+ (Relevant statement), I+ (Important statement), L2+ (Generating new interpretation from the data obtained), NL+ (Learner's brings in new things), C+ (Critical assessment of others' and one's contribution), OE+ (Drawing on personal experience) and AC+ (Clear and unambiguous statement). This sentence served as the reason why the participants agreed with her peer's viewpoints which had appeared in previous posting. The reason provided was based on the personal experience of the participant as a second language learner. The correct use of 'Both' here as the head of elliptical nominal group was vital as it rendered the sentence both relevant (R+) and clear (AC+) in meaning. However, it was not the only source that caused the sentence to be assigned with other codes apart from R+ (Relevant statement) and AC+ (clear and unambiguous) codes. Similar to the example of the nominal substitution above, the assignment of other critical thinking indicators to the ellipsis instances relied heavily upon the content of the sentences where ellipsis was detected. Thus, it is apparent that the assignment of other critical thinking indicators was not determined by the use of ellipsis. For instance, apparently, the use of 'Both' as the head of the elliptical nominal group was not the only source that caused the nominal ellipsis example 5.2.3.1 to be coded as justification (JS+). In fact, it was the content conveyed by the nominal ellipsis example 5.2.3.1

168

above caused it to be coded as justification (JS+).

In the following section, the coding results and the discussions of the instances of conjunction will be outlined.

5.2.4 Conjunction

As mentioned in chapter 1, the lack of the studies which focused on the language use and how it might reflect the critical thinking of its user motivated the researcher to delve into how the use of conjunction might reflect critical thinking of the participants of the threaded discussion in this study. Conjunction which is known as one of the cohesive devices is also further categorized by Halliday and Hasan (1976) into another 4 sub categories, namely the additive, the adversative, the causal and the temporal conjunction. Conjunction is an essential element used to construct logical and sound arguments. The threaded discussion topics were designed in such a way that they required the students to utilize conjunctions to construct arguments. In this case, the effective use of conjunction is crucial because it helps the students in constructing sound and logical arguments. In fact, from the data of this study, it was found that the percentage of use of conjunction was the second highest after reference. In this study, the conjunctive items were categorized into four categories based on the Halliday and Hasan (1976) classification of conjunction. The two most frequently found conjunctive items for each of the four categories will be selected, rendering eight conjunctive items to be selected in total. The sentences in which the eight conjunctive items were detected will be selected and the critical thinking codes assigned to the sentences will be counted and the results will be tabulated. The coding results of the sentences where the 8 conjunctive items were detected will then be studied. The conjunctive items identified for the additive conjunction category were 'and' and 'also', 'but' and 'however' which are known as the adversative conjunction, 'because' and 'so' for the causal conjunction

category, 'then' and 'first' for the temporal conjunction category. The next section will present the discussion of the coding results of additive conjunction 'also' and 'and'.

5.2.4.1 Additive Conjunction

Both **'Also'** and **'And'** are categorized under the additive conjunction category by Halliday and Hasan (1976). In terms of the frequency of occurrences of the conjunctive items categorized under adversative conjunction category additive conjunction category , it was found that the frequency of occurrences of the additive conjunctive item **'also'** is the highest, followed by the additive conjunctive item **'and'**. Overall, 60 instances of **'also'** were detected from the data and 46 instances of **'and'** were detected from the data. The subsequent section presents the discussion of the coding results of adversative conjunction **'also'**.

5.2.4.1.1 Additive Conjunction 'Also'

The conjunction **'also'** is also known as conjunctive adverbial. The conjunctive adverbial 'also' was categorized under the additive conjunctive adverbial category (Celce-Murcia & Larsen-Freeman, 1999) or conjunct (Greenbaum & Quirk, 1990). The coding results of each sentence extracted from all the four transcripts of threaded discussion where 'also' was found are tabulated and shown in Table 5.5 and Table 5.6.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	54	26	50	21	9	19	15	54	56	33	337
Percentage of each positive critical thinking indicators	16.02	7.72	14.84	6.23	2.67	5.64	4.45	16.02	16.62	9.79	100

Table 5.5: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Additive Conjunction "Also" Instances

Table 5.5 above shows the positive critical thinking indicators coding results of sentences where 'also' was detected from each threaded discussion transcript. Overall, the sentences where 'also' appeared were frequently coded as R+ (Relevant statements) at 16.02%, AC+ (Clear and unambiguous statements) at 16.02%, L+ (Linking of ideas and generating new data from information collected) at 16.62%, N+ (Novelty) at 14.84%. The least detected positive critical thinking indicators in the sentences where 'also' were used are O+ (Referring to outside knowledge/experience) at 6.23%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 2.67%, JS+ (Justification) at 5.64% and C+ (Critical assessment of others' or own contribution) at 4.45% . These findings suggest that the use of conjunction 'also' may probably signal the presence of the novel ideas and also new generated data in the threaded discussion transcripts. In other words, these participants may use the conjunction 'also' to add new,

relevant ideas or the new data generated into the threaded discussion. Referring to the coding results of each transcript in Table 5.1,it is noted that the percentage of O+ (Referring to outside knowledge/ experience) for both the SLA 1 and SLA 2 threaded discussion transcripts are higher compared percentage of O+ (Referring to outside knowledge/ experience) for both the RM1 and RM 2 threaded discussion transcripts. This phenomenon implies that the participants from Second Language Acquisition course tended to integrate their personal experience and knowledge into the threaded discussion more often than the participants from Research Methodology Course, specifically through using the conjunction 'also'. Examples of the sentences where the conjunction 'also' was detected are presented below:

Example 5.2.4.1 extracted from the RM 1 threaded discussion transcript

> *I agree with Zhao where literature review should not only be limited to ideas taken from other researchers but **also** to review the critical ideas of current knowledge including substantive findings as well as theoretical and methodological contributions. (R+, C+, AC+) Literature review is not only just a set of summaries but **also** a piece of writing to convey the reader ideas and knowledge that supported by strengths and critics. (R+, AC+, I+, NL+, L+)*

Based on example 5.2.4.1 above, it is evident that both the conjunction 'also' were used as the correlative conjunction pair 'not only….but also'. The first 'also' was used to insert additional information regarding what should be included into literature review besides the ideas taken from other researchers. The second 'also' was used again to add additional personal view of what literature review meant to the participant besides seeing it as a set of summaries. The indicators R+ (Relevant statement), C+ (Critical assessment or evaluation of own or others' contribution) and AC+ (Clear, unambiguous statement) were assigned to the sentence of where the additive conjunction 'also' first

appeared. The second instance of the additive conjunction 'also' indicated the indicators R+ (Relevant statement), AC+ (Clear, unambiguous statement), I+ (Important statement), NL+ (Learner brings new things in) and L2+ (Linking of ideas and generating new data from information collected). Another example that presents the use of 'also' is shown below.

Example 5.2.4.2 extracted from the SLA 1 threaded discussion transcript

> *You **also** highlighted an interesting point about how the learning process of students could be affected by how they were treated by their teachers.(R+, C+, NQ+, AC+,L+) Yes, a teacher who is strict, forceful and harsh will undoubtedly cause the learner to feel more pressure and stress resulting in them not being able to learn as much as they could as this causes they level of anxiety to increase. (OQ+, NQ+, C+, R+, AC+, L2+,W+, OE+,NL+) **Also** due to this reason, their interest in learning would slowly diminish as they will not look forward to attending the lesson. (JS+, R+,AC+, OE+, L2+,NL+, W+,L+)*

Based on example 5.2.4.2 above, the first 'also' was used to introduce another points mentioned by the author of the previous posting. The current participant then extended the discussion by commenting on the point mentioned in the sentence where first 'also' was used. The second 'Also' was used to introduce an additional negative impact of the teacher who was strict, forceful and harsh has on the second language learners.

The first instance where 'also' had been used showed the presence of the indicators R+ (Relevant statement), C+ (Critical assessment or evaluation of own or others' contribution), NQ+ (Welcoming new ideas), L+ (Linking of ideas) and AC+ (Clear, unambiguous statement). The second instance where 'Also' was used at the beginning of the sentence indicated the indicators JS+ (Justifying solutions or judgements), R+ (Relevant statement), AC+ (Clear, unambiguous statement), OE+ (Drawing on personal experience), L+ (Linking of ideas and generating new data from information collected),

NL+ (Learner brings new things in) and W+ (Widen the discussion).

Negative critical thinking indicators	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
RM 1	3	1	2	0	1	0	0	4	1	4
RM 2	1	0	1	0	0	0	1	0	2	1

Table 5.6: The Frequency of Negative Critical Thinking Indicators Assigned to the Additive Conjunction "Also" Instances

Table 5.6 above shows the negative critical thinking indicators coding results of sentences where 'also' was detected from each threaded discussion transcript. In the RM 1 transcript, there are four instances of the conjunction 'also' which indicated the presence of the negative critical thinking indicators and in the RM 2 transcript, there are two instances of conjunction 'also' which indicated the negative critical thinking indicators. However, none of the instances of 'also' in both the SLA 1 and SLA 2 transcripts were assigned with negative critical thinking indicators. Example 5.2.4.3 below shows the instances of 'also' where negative critical thinking indicators were observed. It is extracted from the RM 1 transcript. Example 5.2.4.4 below also presents the instance of 'also' where negative critical thinking indicators were assigned. It is extracted from the RM 2 transcript.

Example 5.2.4.3 extracted from the RM 1 threaded discussion transcript

> *I think literature review could be limited to a summary of others' ideas and points, only if it is organized and chosen in a way that guides the researcher and gives him/her a simple history of that field of research in a clear and easy way. It could **also** include the researcher's opinions and comments as long as they are not mentioned as a statement. (AC-, NI-, R-, W-)*

Based on example 5.2.4.3 above, the conjunction 'also' was used to add extra

information on what should be included in literature review besides a summary of other pertinent research. The coder failed to understand the point the participant tried to convey when the participant said 'as long as they are not mentioned as a statement', rendering it to be coded as ambiguous (AC-), irrelevant and it also narrowed the discussion. It was also treated as false information (NI-).

Example 5.2.4.4 extracted from the RM 2 threaded discussion transcript

> *Your explanation was indeed clear...Thank You I agree to your opinion that in situation A that ꝑrioritization of question is important' and perhaps the interviewee was facing time constraint. Besides, I **also** agree that one must not assume (lay mans term: put words into someone mouth, in asking for clarification.(L-, NS-, C-, W-)*

Based on example 5.2.4.4 above, the conjunction 'also' was used to add extra information in terms of the stance the participant adopted on the viewpoints proposed by her peer in the previous posting. However, the participant of this current posting stated her stance that is she agreed with her peer's comment without generating new interpretation from the her peer's comment (L-), causing her current postings seems to only exhibit NS- (accepting first offered solution) and C-(uncritical acceptance or unreasoned rejection) .In this case, the participant agreed with the viewpoints of her peer without adding any of her own comments and this narrowed the overall discussion (W-).

In the next section, the coding results of additive conjunction 'and' will be described. The additive conjunction 'and' was found to be used intrasententially and intersententially in the data.

5.2.4.1.2 Additive Conjunction 'And'

The conjunction **'and'** is commonly known as coordinating conjunction (Quirk and Greenbaum, 1990; Celce Murcia and Larsen- Freeman, 1999). In this study, only instances of 'and' where it connects two complete sentences intersententially and intrasententially will be taken into account, rendering its overall occurrences to be only 36. According to Halliday and Hasan (1976), however, only intersentential 'and' truly contributes to the text cohesion while intrasentential 'and' which is used structurally to connect linguistic items within a sentence itself does not contribute significantly to the text cohesion. In the data of this study, it was found that the use of 'and' intersententially was rare as there are only 8 instances of intersentential 'And' found in the data. However, the instances of which 'and' was used intrasententially were plenty. Intersentential use of 'and' means 'and' is used at the beginning of a sentence and it connects the sentence with the previous discourse. Intrasentential 'and' means when 'and' is used to connect linguistic items such as words, phrases or clauses within a sentence itself. Apart from that, where semantic meaning of the conjunction 'and' is concerned, the conjunction 'and' has been claimed by many scholars as having multiple meanings; for instance, Ying (2009) stated that the conjunction 'and' can express the additive, adversative, causal and temporal sense depending on the context where the conjunction 'and' was detected . Greenbaum and Quirk (1990) who named the conjunction 'and' as coordinator mentioned that 'and' indicates that 'there is some relation between the contents of the linked clauses'; for instance, 'and' can be used to show that 'the event in the second clause is chronologically sequenced to that in the first' and 'the event in the second clause is a consequence or result of the event in the first. Celce-Murcia and Larsen Freeman (1999) also stated that the coordinator 'and' can be used as logical operator, inferential connective or as a marker which signals the speaker continuation. These different uses expressed by the conjunction 'and' can be

traced in the data of this study.

The coding results of each sentence extracted from the four threaded discussion transcripts where the additive conjunction 'and' was found are tabulated and shown in Table 5.7 below.

Positive Critical Thinking Indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	45	26	36	16	7	25	12	45	49	25	286
Percentage of each positive critical thinking indicator	15.73	9.09	12.59	5.59	2.45	8.74	4.20	15.73	17.13	8.74	100

Table 5.7: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Additive Conjunction "And" Instances

Based on the results presented in Table 5.7 above, the sentences where 'and' appeared were frequently coded as R+ (Relevant statements) at 15.73%, AC+ (Clear and unambiguous statements) at 15.73%, L+ (Linking of ideas and generating new data from information collected) at 17.13%, N+ (Novelty) at 12.59%. The least detected positive critical thinking indicators in the sentences where 'and' was used are O+ (Referring to outside knowledge/experience) at 5.59%, P+(Discussing the practicality of new ideas and suggesting solutions) at 2.45%, both JS+ (Justification) and W+ (Widening the discussion) at 8.74% and C+(Critical assessment of others' or own contribution) at 4.20% . These findings suggest that the use of conjunction 'and' may probably signal the presence of the relevant, novel ideas and also new generated data in the threaded discussion transcripts. In other words, participants may use the conjunction 'and' to add new, relevant ideas or the new data generated from previous information into the threaded discussion. Examples of the sentences where the conjunction 'and'

was detected are presented below:

Example 5.2.4.5 extracted from the RM 1threaded discussion transcript

erm... could i give my comments too? hehe We all know that writing literature review should not be "copy and paste" but it is usually an evaluative report of the found information from others work. Therefore, I believe we are already "quoting" what we see/understand and what is related to our own research (summary etc - authenticity) **and** *we also add in our own opinions with scientific proof if possible* **and** *if I'm not mistaken this in Joanne's words is to (expand it further and to direct it to a different point of view).(R+)(JS+)(C+)(AC+)(L+)*

Based on example 5.2.4.5 above, the two instances of the additive conjunction 'and' showed that the conjunction 'and' was used to add on author's opinions. The sentence where 'and' appeared twice indicated the codes R+ (Relevant statement), JS+ (Justifying solutions or judgements), AC+ (Clear and ambiguous statement), C+ (Critical assessment or evaluation of own and others' contributions) and L+ (Linking of ideas). Here, the use of the additive conjunction 'and' found in both instances in example 5.2.4.5 above expressed the sense of pure addition (Greenbaum and Quirk, 1990). In the second instance the additive conjunction 'and' was found to be combined with the additive conjunction 'also' in order to achieve the addition purpose.

Example 5.2.4.6 extracted from the SLA 1 threaded discussion transcript

Learners simply assume that they do not have ample time to edit their own utterance, which later leads them towards having a higher level of anxiety **and** *ultimately they are more likely to fail in spontaneous conversation, especially ones that are assessed.) (JS+, R+, AC+,L+, I+, NL+, OE+, W+)*

Based on the example 5.2.4.6 above, the conjunction 'and' here was used to express the

cause-consequence relationship (Greenbaum and Quirk, 1990). The conjunction 'and' could be replaced by causal conjunction such as 'so', 'therefore and 'thus' or it could precede either one of the causal conjunction as in 'and so', 'and therefore' and 'and thus'. The indicators R+ (Relevant statement), JS+(Justifying solutions or judgements), AC+(clear, unambiguous statement), L+(Linking of ideas and generating new data from information collected), I+(Important statement), NL+(Learner .brings new things in), OE+ (Drawing on personal experience) and W+(Widening the discussion) were assigned to this instance of the additive conjunction 'and'

Example 5.2.4.7 extracted from the SLA 1 threaded discussion transcript

*I was anxious to learn the language **and** I did better than the others in the class.(JP+,OE+,R+,NL+,W+, L+, AC+) (adversative)*

Based on the example 5.2.4.7 above, the conjunction 'and' here was used to express the sense of adversative as the conjunction 'and' could be replaced by adversative conjunction such as 'yet', or it could precede the adversative conjunction 'yet' as in 'and yet' (Greenbaum and Quirk, 1990). The conjunction 'and' here is said to express the sense of adversative because it cancelled the readers' assumption that the author may likely to perform badly due to the anxiety befell him. Instead, it was the opposite that happened when the author stated that he had performed better than the others under the anxious learning condition and this was something contrary to the expectation of the readers. So, the conjunction 'and' acted as an adversative conjunction in this case. This sentence reflected the indicators JP+(Providing proof or examples) ,OE+ (Drawing on personal experience),R+(Relevant statement),NL+(Learner brings new things in),W+(Widening the discussion), L+(Linking of ideas and generating new data from information collected), and AC+(Clear, unambiguous statement).

Example 5.2.4.8 extracted from the SLA 2 threaded discussion transcript

*Let's leave out learning English at school for a while **and** let's take a look at*
some of English courses offered by certain institutions outside of the school.
(JP+)(NL+(R+)(AC+)(OK+)(L+)

Based on example 5.2.4.8 above, the conjunction 'and' was used to express the meaning 'then' in which it signalled the events happened in a chronological order (Greenbaum and Quirk, 1990). This example was the outcome of the author's daily observation which was coded as OK+ (Using previous knowledge), NL + (Learner brings new things in), JP+ (Providing proof or examples), R+ (Relevant statement), AC+ (Clear, unambiguous statement) and L+ (Linking of ideas and generating new data from information collected). In the next section, the outcome gained after comparing the coding results of both the additive conjunction 'also' and 'and' will be presented.

5.2.4.1.3 Comparison of the coding results of both the additive conjunction 'also' and the conjunction 'and'

Based on the results presented in both Table 5.5 and Table 5.7, it is apparent that the four most frequently detected positive critical thinking indicators were the same for both the conjunction 'also' and the conjunction 'and' . They were recognised as the positive critical thinking indicators R+ (Relevant statement), AC+ (Clear, unambiguous statement), L+ (Linking of ideas or generating new data from information collected) and N+ (Novelty). In addition, the four least detected positive critical thinking indicators were found to be the same for both the additive conjunction 'also' and 'and'. The four least detected indicators were O+(Referring to outside knowledge/ experience), P+(Discussing the practicality of new ideas and suggesting solutions), JS+(Justifying solutions or judgements) and C+ (Critical assessment or evaluation of others' or own contribution). These two similarities observed suggests that the sentences where

additive conjunction 'and' and 'also' were found may likely to exhibit the codes R+(Relevant statement), AC+ (Clear, unambiguous statement), L+(Linking of ideas or generating new data from information collected) and N+ (Novelty) whereas O+ (Referring to outside knowledge/ experience), P+(Discussing the practicality of new ideas and suggesting solutions), JS+ (Justifying solutions or judgements), C+(Critical assessment or evaluation of others' or own contribution) will be the least assigned codes.

Overall, where both the additive conjunction "Also" and "And" instances were concerned, the amount of the instances which exhibited the negative critical thinking indicators found to be small may be because the participants knew that they would be marked down if their postings reflected too many uncritical thinking indicators. In fact, there were only 6 instances of the additive conjunction 'also' found to have been assigned negative critical thinking indicators (Refer to Table 5.6) and there was none of the instances of additive conjunction 'and' being assigned negative critical thinking indicators. The other reason being may be when assigning the negative critical thinking indicators, the coders based their coding decision on the overall contextual meaning of the whole posting and the use of conjunction may not influence the coders' coding decision except when the participants used the conjunction wrongly in their postings and it hampered the comprehension of the readers.

5.2.4.2 Adversative Conjunction

Both **'But'** and '**However'** are categorized under the adversative conjunction category by Halliday and Hasan (1976). In terms of the frequency of occurrences of the conjunctive items categorized under adversative conjunction category, it was found that the frequency of occurrences of the adversative conjunctive item **'but'** is the highest, followed by the adversative conjunctive item **'however'.** Overall, 66 instances of **'but'**

were detected from the data and 36 instances of **'however'** were detected from the data. The following section presents the discussion of the coding results of adversative conjunction **'but'**.

5.2.4.2.1 Adversative Conjunction 'But'

The conjunction **'but'** is commonly known as coordinating conjunction (Quirk and Greenbaum, 1990; Celce Murcia and Larsen Freeman, 1999; Eastwood, 2000). For this study, only instances of 'but' where it was found to connect two complete sentences intersententially and intrasententially will be taken into account, rendering its overall occurrences to be only 65. According to Halliday and Hasan (1976), however, only intersentential 'but' truly contributes to the text cohesion while intrasentential 'but' which is used structurally to connect linguistic items within a sentence itself does not contribute significantly to the text cohesion. In the data of this study, there are 29 instances where the conjunction 'but' was used intersententially. And there are 37 instances where the conjunction 'but' was used intrasententially. Intersentential 'but'refers to when the conjunction 'but' is used at the beginning of a sentence and it connects the sentence with the previous discourse. Intrasentential 'but' refers to 'but' being used to connect linguistic items such as words, phrases or clauses within a sentence itself. Apart from that, where semantic meaning of 'but' is concerned, the conjunction 'but' has been claimed by many scholars as having multiple meanings; for instance, Halliday and Hasan (1976) stated that the conjunction 'but' can express either the adversative or the contrastive sense of meaning depending on the context where it is found. Greenbaum and Quirk (1990) who named the conjunction 'but' as coordinator, mentioned that 'but' can be used to indicate either "the content of the second clause is unexpected in view of the content of the first" or "the second clause expresses in positive terms of what the negation in the first clause conveys." Celce-Murcia and Larsen Freeman (1999) also stated that the coordinator 'but' can be used to convey three

types of semantic meaning. Firstly it is used as the marker that expresses the denial of expectation. Secondly, it is used as the marker that demonstrates the semantic contrast and thirdly it is also used to signal the speaker's return, especially in recovering the lost point when the other speaker stray from the main points.Bell (2007) who studied the pattern of occurrences and functions of sentence initial 'But' in academic writing claimed that generally sentence initial "But" plays three major functions. The functions of sentence initial "But" are firstly to coordinate ideas; secondly, to develop arguments, and thirdly, to shift the topic domain. Bell (2007) further reported that out of the three major functions, sentence initial "But" was mostly used in developing argument. It is said that by cancelling and refining the previous argument, sentence initial 'BUT' helps in developing argument. Bell (1998) argued that "But" together with "However" are both core, primary cancellative discourse markers. In addition, Bell (1998) stated that unlike the discourse marker "nevertheless" which can be used only in the context where expressing concessive relationship is needed, discourse markers "But" and "however" can be used in the context where there is a need to establish concessive relationships and also in the context where there is no any intention to establish concessive relationships.

These different senses expressed by the adversative conjunction 'but' can be traced in the data of this study. Overall, there were 7 instances of adversative 'but' which expressed the contrastive sense, 2 instances of adversative conjunction 'but' which expressed the sense of corrective or indicated "the second clause expresses in positive terms of what the negation in the first clause conveys….." Quirk and Greenbaum (1990). One instance of the adversative conjunction 'but' was found to mark the speaker return, followed by the other instance where the adversative conjunction 'but' marked the topic shift that took place. The other 50 instances of adversative conjunction 'but' which expressed the meaning of contrary to expectation. The coding results of each

sentence extracted from the 4 transcripts of threaded discussion where the adversative conjunction 'but' was found are tabulated and shown in Table 5.8 and Table 5.9.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	61	23	53	21	13	35	36	61	71	41	415
Percentage of each positive critical thinking indicators	14.70	5.54	12.77	5.06	3.13	8.43	8.67	14.70	17.11	9.88	100

Table 5.8 The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Adversative Conjunction "But" Instances

Based on the results presented in Table 5.8 above, overall, the sentences where 'but' was found were frequently coded as R+ (Relevant statements) at 14.70, AC+ (Clear and unambiguous statements) at 14.70%, L+ (Linking of ideas and generating new data from information collected) at 17.11%, N+ (Novelty) at 12.77%. The least detected positive critical thinking indicators in the sentences where 'but' was used are O+ (Referring to outside knowledge/experience) at 5.06%, P+(Discussing the practicality of new ideas and suggesting solutions) at 3.13 %, I+ (Important statement) at 5.54%. The percentage of JS+ indicator is 8.42% and C+ (Critical assessment of others' or own contribution) indicator is 8.67%. These findings suggest that the use of conjunction 'but' may probably signal the presence of the relevant, novel ideas and also new generated data in the threaded discussion transcripts. In other words, participants used the conjunction 'but' to introduce new and relevant viewpoints into the threaded discussion. Examples of sentences where the conjunction 'but' was detected are presented below:

Example 5.2.4.9 extracted from the RM 1 threaded discussion transcript

*We all know that writing literature review should not be 'copy and paste **but** it*

should be an evaluative report of the others work (R+, I+. AC+, L+).

Based on example 5.2.4.9 above, the adversative conjunction 'but' was used to express the sense of corrective as it could be replaced by conjunction such as "rather" and "instead" which according to Halliday and Hasan (1976), they played the corrective role. The codes R+ (Relevant statement), I+ (Important statement), AC+ (Clear, unambiguous statement) and L+ (Linking of ideas) were assigned to 'but' sentence above.

Example 5.2.4.10 extracted from the RM 2 threaded discussion transcript

*To highlight, in Situation A, the interviewer actually gave his or her answer and the interviewee ˇguessed"that the interviewer got the point. **But** what exactly is the point? (R+, C+, AC+, NL+, W+, L+)*

Based on example 5.2.4.10 above, the sentence initial adversative conjunction 'But' was used as a topic shift marker (Bell, 2007). The use of the adversative conjunction 'But' here allowed the participant to introduce new topic of discussion. The example 5.2.4.10 indicated the presence of the indicators R+ (Relevant statement), C+ (Critical assessment or evaluation of own and others' contribution), AC+ (Clear, unambiguous statement), NL+ (Learner brings new things in), W+ (Widen the discussion) and L+ (Linking of ideas and generating new data from information collected).

Example 5.2.4.11 extracted from the SLA 1 threaded discussion transcript

*The introverts could be shy and less interactive **but** the knowledge that they acquire could be even in a wider range or in par with the extroverts. (JS+,NL+,R+, AC+,OE+, C+, L+)*

Based on example 5.2.4.11 above, the adversative conjunction 'but' was used to express the sense of contrary to expectation. The participant here presented the point that

appeared to contradict some readers' belief in terms of the amount of knowledge acquired by both extroverts and introverts. The codes JS+ (Justifying solutions and judgements), NL+ (Learner brings new things in), R+ (Relevant statement), AC+ (Clear, unambiguous statement), OE+ (Drawing on personal experience), L+ (Linking of ideas and generating new data from information collected) and C+ (Critical assessment or evaluation of others' or own contribution) were assigned to example 5.2.4.11 above.

Example 5.2.4.12 extracted from the SLA 1 threaded discussion transcript

> *If speaking or oral skills are to be taken into account, I believe that a person who has a high self- confidence and participates a lot in class would have the tendency to improve more. **But** in case of writing and reading skills, there is no clear and distinctive measure of how a person with high confidence can excel better than those who are not. (JS+,R+, AC+ NL+, L+, W+, OE+, C+)*

Based on example 5.2.4.12 above, the sentence initial adversative conjunction 'But' was used in a contrastive sense (Halliday and Hasan, 1976). The participant here contrasted speaking or oral skills with writing and reading skills in terms of how the level of self-confidence might affect the performance of second language learners in those language skills. The codes JS+ (Justifying solutions and judgements), R+ (Relevant statement), AC+ (Clear, unambiguous statement), NL+ (Learner brings new things in), L+ (Linking of ideas and generating new data from information collected), W+ (Widen the discussion) and OE+ (Drawing on personal experience) and C+ (Critical assessment or evaluation of others' or own contribution) were assigned to the 'but' instance found in example 5.2.4.12 above.

Example 5.2.4.13 extracted from the SLA 1 threaded discussion transcript

*Thanks Tanusha**, but** I feel that you actually agreed with my opinion.(C+, OQ+, NQ+, R+, L+, AC+, W+).*

Based on example 5.2.4.13 above, the adversative conjunction 'But' was used to signal the speaker's return (Celce-Murcia and Larsen Freeman, 1999). The participant here tried to state the fact that Tanusha who commented after him actually agreed to his previous points. The codes R+ (Relevant statement), AC+ (Clear, unambiguous statement), NQ+ (Welcoming new ideas), L+ (Linking of ideas/Generating new data from information collected), W+ (Widen the discussion) and OQ+ (Welcoming outside knowledge) were assigned to the 'but' instance found in example 5.2.4.13 above.

Apart from presenting the examples of adversative conjunction 'But' which were assigned the positive critical thinking indicators, it is found that negative critical thinking indicators were assigned to several sentences where the adversative conjunction "But" was detected. Table 5.9 presented on the next page, shows the coding frequency in number of negative critical thinking indicators for each threaded discussion transcripts. According to the results tabulated in Table 5.9, negative critical thinking indicators were assigned to 5 sentences in the RM 1 threaded discussion transcript and 1 sentence in the SLA 1 threaded discussion transcript. However, in both the RM2 and SLA 2 threaded discussion transcripts, there were no sentences where the adversative conjunction 'but' was assigned the negative critical thinking indicators. Examples of the sentences which were assigned negative critical thinking indicators are presented.

Negative critical thinking indicators	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
RM 1	2	0	0	0	0	1	2	2	0	2
SLA 1	0	0	1	0	0	0	0	1	1	0

Table 5.9: Negative critical thinking indicators assigned to the adversative conjunction "But" Instances

Example 5.2.4.14 extracted from the RM 1 threaded discussion transcript

> **But** *you said that our comments will be with the literature review; in my opinion, I think it will destroy the primitive literature. (JS-, AC-, W-, C-)*

Based on example 5.2.4.14 above, the reason why the example above was assigned with negative critical thinking indicators is that the coder did not understand the point the participant tried to convey as the participant did not justify his opinion further. The example 5.2.4.14 above reflected the codes JS- (Offering judgements or solutions without explanations or justifications), AC-(Confused statement) and W- (Narrow the discussion) and C-(Uncritical acceptance and unreasoned rejection).

Example 5.2.4.15 extracted from the SLA 1 threaded discussion transcript

> **But** *it's undeniable that the learner will not face anxiousness.(AC-,R-,NI-,W-) Even the bright sparks could face anxiety at times.*

Based on example 5.2.4.15 above, the use of 'but' did not result in the sentence to be marked with negative critical thinking indicators. It was the grammatical mistake that caused the sentence to be marked as AC- (confuse statement), R- (Irrelevant statement), NI-(False lead) and W- (Narrow the discussion). The correct version of the sentence should be **"But** it's undeniable that the learner will face anxiousness", where 'not' was omitted. In the next section, the coding results of adversative conjunction 'however' will be described.

5.2.4.2.2 Adversative conjunction 'However'

According to Halliday and Hasan (1975), the adversative conjunction 'however' has two semantic meanings. The first semantic meaning is it expresses the sense of 'contrary to expectation' and the second is its use to express semantic contrast. Celce Murcia and Larsen Freeman (1999) stated that while 'however' can be used to express semantic contrast, it can also be used as a topic shift marker and they regarded the adversative conjunction 'however' as a conjunctive adverbial. Greenbaum and Quirk (1990) categorised the conjunction 'however' under the category they called 'concessive'. Table 5.10 below presents the coding result of positive critical thinking indicators of the adversative conjunction 'However'.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	32	11	30	12	7	11	19	32	32	23	209
Percentage	15.31	5.26	14.35	5.74	3.35	5.26	9.09	15.31	15.31	11.00	100

Table 5.10: The frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Adversative Conjunction "However" Instances

Based on the results presented in Table 5.10 above, the sentences where 'however' was found were frequently coded as R+ (Relevant statements) at 15.31, AC+ (Clear and unambiguous statements) at 15.31%, L+ (Linking of ideas and generating new data from information collected) at 15.31%, N+ and (Novelty) at 14.35%. The least detected positive critical thinking indicators in the sentences where 'however' was found are O+ (Referring to outside knowledge/experience) at 5.74%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 3.35 %, I+ (Important statement) at 5.26% and JS+(Justifying solutions or judgements) at 5.26% . The percentage of C+ (Critical assessment or evaluation of own and others' contribution) is 9.09% and the percentage of W+ (Widen the discussion) is 11.00%. These findings suggest that the use of

conjunction 'however' may probably signal the presence of the relevant, novel ideas and also new generated data in the threaded discussion transcripts which were likely the outcome of assessing and evaluating others' and own contributions critically. This has in turn widened the discussion. Examples of sentences where the adversative conjunction 'However' was detected are presented below:

Example 5.2.4.16 extracted from the RM 2 threaded discussion transcript

> *Hi Ida, good point on that. Although I think there should be a limit of the amount of 'warm up' questions due to time factor. **However**, I do agree with you that Malaysians are generally shy in voicing their opinions... even in 'normal topics'... furthermore I think most will be careful to give an 'acceptable' answers that conform to the norm/public views (C+, JS+, OE+, NL+, R+, AC+, W+, I+,L+).*

Based on example 5.2.4.16 above, the conjunction 'however' was used to express the sense of concession (Greenbaum and Quirk, 1990). The sentence began with the conjunction "However" was coded as C+ (Critical assessment or evaluation of own and others' contributions), JS+(Justifying solutions or judgements), OE+ (Drawing on personal experience or knowledge), NL+ (Learner brings new things in), R+ (Relevant statement), AC+(Clear, unambiguous statement), W+(Widen the discussion), I+ (Important statement) and L2+ (Linking of ideas and generating new data from information collected).

Example 5.2.4.17 extracted from the RM 2 threaded discussion transcript

> *After reading the others' responses and opinions regarding the aspects which need to be taken into consideration by interviewers while conducting interviews, I think they have successfully listed, mentioned and discussed most of the aspects extensively. **However**, I would like to consider on the interview's questions*

(NL+, R+, AC+, W+, I+, L+).

Based on example 5.2.4.17, the conjunction 'However' was used as a topic shift marker. It allowed the participant to start to talk about a new topic or focus on a new point. The sentence began with the conjunction 'However' was coded as NL+ (Learner brings new things in), R+ (Relevant statement), AC+ (Clear, unambiguous statement), W+ (Widen the discussion), I+(Important statement) and L+(Linking of ideas and generating new data from information collected).

Example 5.2.4.18 extracted from the SLA 1 threaded discussion transcript

> *Based on my own experience as a second language learner, there were times when my anxiety level was high. **However**, it was this anxiety that prompt me to be well-prepared and give my best. (JS+, OE+, R+, NL+, W+, L+, AC+, C+) .Anxiety can be a source of motivation rather than a cause for failure.*

Based on example 5.2.4.18 above, the conjunction 'However' was used to express the sense of 'contrary to expectation' by dispelling the readers' assumption that 'anxiety' would demotivated the author to learn the second language. The sentence began with the conjunction 'However' reflected the indicators JS+ (Justifying solutions or judgements), OE+ (Drawing on personal experience or knowledge), R+ (Relevant statement), NL+ (Learner brings new things in), W+ (Widen the discussion), L2+ (Linking of ideas and generating new data from information collected), AC+ (Clear, unambiguous statement) and C+ (Critical assessment or evaluation of others' or own contribution)

Example 5.2.4.19 extracted from the SLA 2 threaded discussion transcript

> *I do agree with the premise as well. Those days, the curriculum for the English language, well in fact when I was still schooling, the teachers emphasized more*

on rules and the application of the rules in a structured way. Furthermore, reading and writing skills were given more focus compared to listening and speaking skills. This is not to say that teachers did not teach listening and speaking, it was just that the importance was not given to both of these skills. **However,** *looking at the importance of the English Language especially in using the language for social purpose or in delivering a message, communicative approach is now used (JS+, OE+, NL+, R+, AC+, L+ and W+).*

Based on example 5.2.4.19 above, the conjunction 'However' was used to express the contrastive sense. The participant contrasted the language skills the teachers focused on back then with the language skills the teachers focused on now. The sentence began with 'However' was coded as JS+ (Justifying solutions or judgements), OE+ (Drawing on personal experience or knowledge), NL+ (Learner brings new things in), R+ (Relevant statement), AC+ (Clear, unambiguous statement), L+ (Linking of ideas and generating new data from information collected) and W+ (Widen the discussion). Next, the negative critical thinking indicators coding results of the adversative conjunction 'however' will be presented in Table 5.11 below.

Negative critical thinking indicators	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
RM 1	1	0	1	0	0	0	0	1	0	1

Table 5.11: The Frequency of Each of the Negative Critical Thinking Indicators Assigned to the Adversative Conjunction "However" Instances

Based on the results presented in Table 5.11, there was only one instance of the conjunction of 'However' which showed the presence of the negative critical thinking indicators found in the RM 1 threaded discussion transcript. There was no instance of the conjunction 'However' in the RM 2, SLA 1 and SLA 2 threaded discussion transcripts indicated the negative critical thinking indicators. Below is the example

extracted from the RM 1 threaded discussion transcript in which the instance of the conjunction 'However' was found to exhibit the negative critical thinking indicators.

Example 5.2.4.20 extracted from the RM 1 threaded discussion transcript

__However__, sometimes when the researcher's opinions contradicts with the ideas/ opinions of other researchers, the contradicting ideas/opinion will become a statement (unless further research has been done to prove it) (AC-,R-, N-, W-).

Based on example 5.2.4.20 above, the cause of it being assigned negative critical thinking indicators did not lie in the use of the conjunction 'However'. It is because the coder did not understand the content of the sentence, rendering it to be coded AC-(Confuse statement), R-(Irrelevant statement), N- (False lead) and W- (Narrow the discussion). In the next section, the outcome gained after comparing the coding results of both the adversative conjunction 'But' and 'However' will be presented.

5.2.4.2.3 Comparison of the coding results of both the adversative conjunction 'But' and 'However'

Based on the results shown in both Table 5.8 and Table 5.10, in terms of positive critical thinking indicators R+ (Relevant statement), I+ (Important statement), O+(Referring to outside knowledge/experience), P+ (Discussing practicality of new ideas and suggesting solutions), C+ (Critical assessment or evaluation of others' or own contribution) , AC+ (Clear, unambiguous statement), L+(Linking of ideas or generating new data from information collected) and W+ (Widen the discussion), the percentage recorded for both adversative conjunction 'but' and 'however' did not differ significantly. However, the percentage of JS+ (Justifying solutions or judgments) indicator and N+ (Novelty) indicator of both adversative conjunction "but' and

'however' differed quite significantly. The percentage of N+ (Novelty) indicator for adversative conjunction 'however' is 14.35% and the percentage of N+ (Novelty) indicator for adversative conjunction 'but' is 12.77%. The JS+ (Justifying solutions or judgments) indicator percentage is 5.26% for the adversative conjunction 'however' and 8.43% for the adversative conjunction 'but'.

Next, based on the results presented in Table 5.9 and Table 5.11, 6 instances where the adversative conjunction 'But' was found reflected some negative critical thinking indicators. On the other hand, only one instance of the adversative conjunction 'however' was assigned some negative critical thinking indicators. Overall, where both the adversative conjunction "but" and "however" instances are concerned, the amount of the instances which exhibited the negative critical thinking indicators is considered small. This may be because the participants knew that they were be marked down if their postings reflected too many uncritical thinking indicators.

5.2.4.3 Causal Conjunction

Both **'Because'** and 'So' are categorized under the causal conjunction category by Halliday and Hasan (1976). In terms of the frequency of occurrences of the conjunctive items categorized under causal conjunction category, it was found that the frequency of occurrences of the causal conjunctive item **'because'** is the highest, followed by the causal conjunctive item **'so'.** Overall, 53 instances of **'because'** were detected from the data and 28 instances of **'so'** were detected from the data. The following section presents the discussion of the coding results of adversative conjunction **'because'**.

5.2.4.3.1 Causal Conjunction 'Because'

Causal conjunction 'because' is known as subordinating conjunction by some scholars (Quirk and Greenbaum, 1990; Celce Murcia and Larsen Freeman, 1999). According to

Halliday and Hasan (1976), only instances where sentence initial 'Because' were found can be considered as providing cohesion. However, in the data of this study, the causal conjunction 'because' was not used at the sentence initial position. Instead, all the instances where the causal conjunction 'because' was found showed that it had been used as a subordinating conjunction where it functions to join dependent clause to an independent clause. According to Lopes (2009), from the pragmatic coherence relations perspective, the causal conjunction 'because' could be used to express both justification and cause and effect relations. In the argumentative writing data collected by Prommas and Sinwongsuwat (2011), it is noticeable that the conjunction 'because' was used by both Thai learners and native speakers to state reasons more than cause. The researcher stated that this observation was caused by the fact that in argumentative writing genre, the students ought to provide reasons to support their claims; thus causing them to use 'because' to state the reasons instead of using it to express cause and effect relation. In this study, the similar phenomenon was observed. There were 41 instances of 'because' which was used to state reason or express justification relation were 41 and the frequency of instances where 'because' was used to express cause and effect relation was 12. The different senses expressed by the causal conjunction 'because' can be traced in the data of this study. The coding results of each sentence extracted from the four threaded discussion transcripts where the causal conjunction 'because' was detected are tabulated and shown in Table 5.12 on the next page.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	48	31	37	15	9	43	16	48	56	33	336
Percentage of each positive critical thinking indicators	14.29	9.23	11.01	4.46	2.68	12.80	4.76	14.29	16.67	9.82	100

Table 5.12: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Causal Conjunction "Because" Instances

According to the results tabulated in Table 5.12 above, it is noticeable that the four most frequently assigned positive critical thinking indicators for the causal conjunction 'Because' are R+ (Relevant statement) 14.29%, AC+ (Clear, unambiguous statement) at 14.29% , JS+ (Justifying solutions or judgements) at 12.80% and L+ (Linking of ideas or generating new data from information collected) at 16.67% while the four least detected positive critical thinking indicators are I+ (Important statement) at 9.23%, O+ (Referring to outside knowledge/ experience) at 4.46%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 2.68% and C+(Critical assessment or evaluation of others' or own contribution) at 4.76%. These findings imply that participants able to use the causal conjunction 'because' to produce relevant (R+), clear (AC+), justified claims(JS+) and also coherent piece of postings (L+) and these helped in widening the discussion (W+). There were no instances of the causal conjunction 'Because' which indicated the presence of any negative critical thinking indicators. Examples of the sentences where the causal conjunction 'Because' was detected are presented on the next page:

Example 5.2.4.21 extracted from the RM1 threaded discussion transcript

*Thus, it contradicts with the Taylor's statement "A literature review is a piece of discursive prose, not a list which describes or summarizes one piece of literature review after another.....' This is **because** the first part usually consists of description and summarization of the works done by others. (JS+, R+, NI+, W+, AC+, L+ and C+)*

Based on example 5.2.4.21 above, the causal conjunction 'because' was used to state the reason why the participant made the former claims. The codes JS+ (Justifying solutions or judgements), R+ (Relevant statement), NI+ (New ideas for discussion), W+ (Widen the discussion), AC+ (Clear, unambiguous statement), L+ (Linking of ideas and generating new data from information collected) and C+ (Critical assessment or evaluation of others' or own contribution) were assigned to the instance of the causal conjunction 'because' above.

Example 5.2.4.22 extracted from the SLA 1 threaded discussion transcript

*When I first attended my third language class, I was extremely drowned with anxiety. I did not participate much **because** I did not have much knowledge about the subject matter (JS+, R+, OE+, AC+, W+, L+ and NL+).*

Based on the example 5.2.4.22 above, the causal conjunction 'because' was used to express the cause and effect relation. Lacking of knowledge about the subject matter was the cause that had resulted in the participant could not participate much during her third language class. This instance of 'because' here reflected the codes R+ (Relevant statement), OE+ (Drawing on personal experience), AC+ (Clear, unambiguous statement), W+ (Widen the discussion), L+ (Linking of ideas and generating new data

from information collected) and NL+ (Learner brings new things in). In the next section, the coding results of the causal conjunction 'So' will be presented and discussed.

5.2.4.3.2 Causal Conjunction 'So'

According to Celce Murcia and Larsen Freeman (1999), the causal conjunction 'so' can expressed cause-results relation or it can be used as an inferential connective and it was categorized under the coordinating conjunction group. In the data of this study, it was found that the instances of the causal conjunction 'so' was used mostly as inferential connective instead of being used to signal cause-results relation. Out of the 28 instances of 'so', only two instances of 'so' signalled the cause-results relation. Next, the results presented in Table 5.13 will be discussed.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	25	14	15	4	8	7	7	25	37	12	154
Percentage of each positive critical thinking indicators	16.23	9.09	9.74	2.60	5.20	4.54	4.54	16.23	24.03	7.79	100

Table 5.13: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Causal Conjunction "So" Instances

According to the results tabulated in Table 5.13 above, it is noticeable that the four most frequently assigned positive critical thinking indicators for the causal conjunction 'So' were R+ (Relevant statement) at 16.23%, AC+ (Clear, unambiguous statement) at 16.23%, N+ (Novelty) at 9.74% and L+ (Linking of ideas or generating new data from information collected) at 24.03% while the four least detected positive critical thinking indicators JS+ (Justifying solutions or judgements) at 4.54%, O+ (Referring to outside knowledge/ experience) at 2.60%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 5.20% and C+(Critical assessment or evaluation of others' or own contribution) at 4.54%. These findings imply that participants used the causal conjunction 'so' to produce relevant, clear, new claims and also coherent piece of postings. All these contributions helped in widening the discussion. Examples of the sentences where the causal conjunction 'So' was detected are presented on the next page.

Example 5.2.4.23 extracted from the SLA 2 threaded discussion transcript

> *But then, it is a doubt that this can work because the students' family and the society around them seem to use their mother tongue in the communication between them. **So**, students will continue to use their mother tongue without having to realize that the effort of the educator's in teaching them the skills in learning English language would be meaningless.(I+, P+, R+, AC+, L+)*

The causal conjunction 'So' was used at the beginning of the sentence in example 5.2.4.23 above and it expressed the causal-result relation. As stated by the participant, the use of mother tongue in the students' family resulted in the students to continue to communicate using their mother tongue. The codes I+ (Important statement), P+ (Discussing the practical utility of an idea), R+ (Relevant statement), AC+ (Clear, unambiguous statement) and L+ (Linking of ideas or generating new data from information collected) were assigned to the instance of the causal conjunction 'so' above.

Example 5.2.4.24 extracted from the SLA 1 threaded discussion transcript

> *Whereas, learners with low motivation and self-confidence tend to stutter at the front of the class as they are affected by the high level of anxiety. In addition, they are prone to make mistakes in their speech production and leaves out some of the important points that were actually written in their notes before the presentation began. **So** with this, I could conclude that they are being affected by the penetration of high anxiety.(R+, AC+, C+, W+, L+)*

The causal conjunction 'so' in example 5.2.4.24 above did not express the cause-result relation. Rather, it was used as inferential connector which enabled the participant to construct an inference based on the former statements. This instance of the causal conjunction 'so' above reflected the indicators R+ (Relevant statement), AC+ (Clear,

unambiguous statement), C+ (Critical assessment or evaluation of others' or own contribution), W+ (Widen the discussion), L+(Linking of ideas or generating new data). In the next section, the negative critical thinking indicators coding results of the causal conjunction 'So' will be presented and discussed.

Negative critical thinking indicators	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
RM 1	2	1	0	0	1	1	0	2	0	1
SLA 2	1	0	0	0	0	0	0	1	0	1

Table 5.14: The Frequency of Negative Critical Thinking Indicators Assigned to the Causal Conjunction "So" Instances

Based on the results shown in Table 5.14 above, there were two instances of the causal conjunction 'So' found in the RM 1 threaded discussion transcripts and one instances of the causal conjunction 'So' found in the SLA 2 were assigned the negative critical thinking indicators. Example 5.2.4.25 below was an example extracted from the RM 1 threaded discussion transcript.

Example 5.2.4.25 extracted from the RM 1 threaded discussion transcript

> *A literature review is a serious and formal piece of writing, **so** the author should not be biased on a particular topic or finding because discussion on a particular topic or finding should only happen under the sub topic of findings or discussion. (R-, AC-, P- and W-)*

This instance of the causal conjunction 'so' in example 5.2.4.25 above reflected the negative indicators R- (Irrelevant statement), AC-(Confused statement) and P- (Discuss in a vacuum) and W- (Narrow the discussion). This is because the coder failed to understand the message the participant tried to convey in the example 5.2.4.25 above.

5.2.4.3.3 Comparison of the coding results of both the causal conjunction 'Because' and 'So'

Based on the results shown in both Table 5.12 and Table 5.13, in terms of positive critical thinking indicators R+ (Relevant statement), N+(Novelty), O+ (Referring to outside knowledge/experience), P+ (Discussing practical utility of new ideas and suggesting solutions), C+ (Critical assessment or evaluation of others' or own contribution) , AC+ (Clear, unambiguous statement), and W+ (Widen the discussion), the percentage recorded for both causal conjunction 'because' and 'so' did not differ significantly. However, the percentage of L+ (Linking of ideas or generating new data from information collected) indicator and JS+ (Justifying solutions or judgments) indicator of both causal conjunction ''because' and 'so' differed quite significantly. The L+ (Linking of ideas or generating new data from information collected) indicator percentage is 16.27% for the causal conjunction 'Because' while 24.03% for the causal conjunction 'so'. In addition, the JS+ (Justifying solutions or judgments) indicator percentage is 12.08%% for the causal conjunction 'because' and 4.54% % for the causal conjunction 'so'.

Next, based on the results presented in Table 5.14, 3 instances where the causal conjunction 'so' was found indicated some negative critical thinking indicators. However, there were no sentences of the causal conjunction 'because' showing the presence of the negative critical thinking indicators. All the differences and similarities observed in the coding results may be caused by firstly the different relations the causal conjunctive items 'Because' and 'So' can express. For instance, 'the causal conjunction was used mainly to express reason that used to justify participants' claims and secondly, it is because the participants were aware that if their postings indicated the presence of too many negative critical thinking indicators, they would be marked down by the courses' instructors. Therefore, the instances where the causal conjunction 'because'

was found were mostly assigned the JS+ (Justifying solutions or judgements) indicator. In the next section, the coding results of temporal conjunction 'Then' and 'First' will be presented and discussed.

5.2.4.4 Temporal Conjunction

Both **'Then'** and '**First'** are categorized under the temporal conjunction category by Halliday and Hasan (1976). In terms of the frequency of occurrences of the conjunctive items categorized under causal conjunction category, it was found that the frequency of occurrences of the temporal conjunctive item **'then'** is the highest, followed by the temporal conjunctive item **'first'.** Overall, 7 instances of **'then'** were detected from the data and 3 instances of **'first'** were detected from the data. The following section presents the discussion of the coding results of temporal conjunction **'then'**

5.2.4.4.1 Temporal Conjunction 'Then'

The temporal conjunction 'then' is also known as sequential conjunctive adverbial by Celce Murcia and Larsen Freeman (1999). On the other hand, Greenbaum and Quirk (1990) claimed that it is a conjunct which plays the semantic role as enumerative. There were 7 instances of 'then' which were found in the data of this study.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	7	4	6	4	1	2	2	7	12	6	51
Percentage of each positive critical thinking indicators	13.73	7.84	11.76	7.84	1.96	3.92	3.92	13.73	23.53	11.76	100

Table 5.15: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Temporal Conjunction "Then" Instances

Based on the results presented in Table 5.15 above, it seems that the five most frequently detected positive critical thinking indicators for instances of the temporal conjunction 'then' are R+ (Relevant statement), AC+ (Clear, unambiguous statement), N+ (Novelty) and L+ (Linking of ideas or generating new data from information collected) and W+ (Widen the discussion in which the N+(Novelty) and W+ (Widen the discussion) indicators shared the same percentage that was 11.76% while the five least detected positive critical thinking indicators are I+ (Important statement), JS+ (Justifying solutions or judgements), O+ (Referring to outside knowledge/ experience), P+ (Discussing the practicality of new ideas and suggesting solutions) and C+(Critical assessment or evaluation of others' or own contribution). These findings suggest that participants used the temporal conjunction 'then' to produce relevant (R+), clear (AC+), new claims (N+) and also coherent piece of postings (L+). All these inputs widened the discussion. Examples of sentences where the temporal conjunction 'then' was detected are presented below:

Example 5.2.4.26 extracted from the RM 1 threaded discussion transcript

The ideas should be developed and critical opinions should be given where

necessary. And the author also needs to find some ideas which were proved by

previous researcher. **Then** *making comparisons or contrasts; giving evidences*

while addressing the aim of the research (NP+, I+, R+, AC+, OK+. L+, W+).

The sentence initial temporal conjunction 'then' found in example 5.2.4.26 above was used to show the sequence of the steps of writing a literature review. NP+(New problem related information), I+ (Important statement), R+ (Relevant statement), AC+ (Clear, unambiguous statement), OK+(Evidence of using previous knowledge), L+ (Linking of ideas or generating new data from information collected) and W+ (Widen the discussion) positive critical thinking indicators were assigned to this instance of 'then'.

Example 5.2.4.27 extracted from the RM 2 threaded discussion transcript

> *Sometimes, when an interviewee gets stuck, we could perhaps assist him or her* **then** *by asking questions in a way that would help him to express his or her intended meaning.*(C+, P+, NS+, W+, R+, AC+, L+, I+)

The temporal conjunction 'then' found in example 5.2.4.27 above was used to show the sequence of measures adopted during an interview session. NS+(New problem related information), I+ (Important statement), R+ (Relevant statement), AC+ (Clear, unambiguous statement), OK+(Evidence of using previous knowledge), L+ (Linking of ideas or generating new data from information collected) and W+ (Widen the discussion) positive critical thinking indicators were assigned to this instance of 'then'.

5.2.4.4.2 Temporal Conjunction 'First'

The temporal conjunction 'first' is also known as sequential conjunctive adverbial by Celce Murcia and Larsen Freeman (1999). On the other hand, Greenbaum and Quirk (1990) claimed that it is a conjunct which plays the semantic role as enumerative. There were 3 instances of 'first' which were found in the data of this study.

Positive critical thinking indicators	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+	Total
Frequency	3	3	3	2	1	0	0	3	5	3	23
Percentage of each positive critical thinking indicators	13.04	13.04	13.04	8.70	4.35	0	0	13.04	21.74	13.04	100

Table 5.16: The Frequency and Percentage of Positive Critical Thinking Indicators Assigned to the Temporal Conjunction "First" Instances

Based on the results presented in Table 5.16 above, it seems that the most frequently detected positive critical thinking indicators for instances of the temporal conjunction 'first' were R+ (Relevant statement) at 13.04%, I+ (Important statement) at 13.04%, AC+ (Clear, unambiguous statement) at 13.04%, N+ (Novelty) at 13.04% and L+ (Linking of ideas or generating new data from information collected) at 21.74% and W+ (Widen the discussion) at 13.04%. The R+ (Relevant statement), I+ (Important statement), N+ (Novelty), AC+ and W+ (Widen the discussion) indicators shared the same percentage that is 13.04%. On the other hand, the least detected positive critical thinking are O+ (Referring to outside knowledge/ experience) at 8.70%, P+ (Discussing the practicality of new ideas and suggesting solutions) at 4.35%, JS+ (Justifying solutions or judgements) at 0% and C+(Critical assessment or evaluation of others' or own contribution) at 0%. These findings suggest that the temporal conjunction 'first' was used to construct relevant (R+), clear (AC+), important(I+), new claims (N+) and also coherent (L+) piece of postings. All these participants' inputs widened the discussion. Examples of the sentences where the temporal conjunction 'first' was found are presented on the next page.

Example 5.2.4.28 extracted from the RM 2 threaded discussion transcript

> ***First*** *and foremost, interviewer needs to avoid biased questions as these types of questions encourage interviewee (participant) to respond to the question in a particular biased way. (R+, AC+, I+, NP+, OK+, L+ and W+)*

The temporal conjunction 'first' was used in the form of 'first and foremost' in example 5.2.4.28 above. It was used to inform the readers the first thing the interviewer should bear in mind when conducting an interview. R+ (Relevant statement),AC+ (Clear, unambiguous statement), I+ (Important statement), NP+ (New problem related information), OK+ (Evidence of using previous knowledge), L+ (Linking of ideas and generating new data from information collected) and W+ (Widen the discussion) were given to this instance of the temporal conjunction 'first'

Example 5.2.4.29 extracted from the SLA 2 threaded discussion transcript

> *So, I suggest that there should be an area for improvement in this approach as to* ***first*** *identify the needs of it in terms of achieving students' goals in language learning. (R+, AC+, NI+,P+,W+, L+)*

The temporal conjunction 'first' is used in the form of 'first and foremost' in example 5.2.4.29 above. It was used to state the first thing that should be done in order to improve practice of sociocultural approach in second language classroom. R+ (Relevant statement), AC+ (Clear, unambiguous statement), I+ (Important statement), NI+ (New idea for discussion), P+ (Discuss the practical utility of new ideas), W+ (Widen the discussion) were assigned to this instance of the temporal conjunction 'first' and L+ (Linking of ideas and generating new data from information collected).

5.2.4.4.3 Comparison of the coding results of both the temporal conjunction 'Then' and 'First'

Based on the results shown in both Table 5.15 and Table 5.16, in terms of the percentage of positive critical thinking indicators R+ (Relevant statement), N+(Novelty), O+(Referring to outside knowledge/experience), P+ (Discussing the practicality of new ideas and suggesting solutions), L+ (Linking of ideas or generating new data from information collected) , AC+(Clear, unambiguous statement), and W+ (Widen the discussion) , the percentage recorded for both temporal conjunction 'then' and 'first' did not differ significantly. However, the percentage of I+ (Important statement), P+ (Discussing the practicality of new ideas and suggesting solutions), JS+ (Justifying solutions or judgments) and C+ (Critical assessment or evaluation of others' or own contribution) indicators of both temporal conjunction "then' and 'first' differed quite significantly. Firstly, the I+ (Important statement) indicator percentage is7.84% for the temporal conjunction 'then' while 13.04% is for the temporal conjunction 'first'. Then, the JS+ (Justifying solutions or judgments) indicator percentage is 3.92% for the temporal conjunction 'then' and 0% for the temporal conjunction 'first'. Thirdly, P+ (Discussing the practicality of new ideas and suggesting solutions) indicator percentage is 1.96% for temporal conjunction 'then' and 4.35% for temporal conjunction 'first'. Lastly, the C+ (Critical assessment or evaluation of others' or own contribution) percentage for temporal conjunction 'then' is 3.92% while the C+ (Critical assessment or evaluation of others' or own contribution) percentage for temporal conjunction 'first' was 0%. Another similarly observed was there were no instances of the temporal conjunction 'then' and 'first' exhibited any negative critical thinking characteristics.

 In the next section, the overview of the positive critical thinking indicators' coding results will be presented.

Positive CT Indicators vs Conjunction	R+	I+	N+	O+	P+	JS+	C+	AC+	L+	W+
Also	16.02	7.72	14.84	6.23	2.67	5.64	4.45	16.02	16.62	9.79
And	15.73	9.09	12.59	5.59	2.45	8.74	4.20	15.73	17.13	8.74
But	14.70	5.54	12.77	5.06	3.13	8.43	8.67	14.70	17.11	9.88
However	15.31	5.26	14.35	5.74	3.35	5.26	9.09	15.31	15.31	11.00
Because	14.29	9.23	11.01	4.46	2.68	12.80	4.76	14.29	16.67	9.82
So	16.23	9.09	9.74	2.60	5.20	4.54	4.54	16.23	24.03	7.79
Then	13.73	7.84	11.76	7.84	1.96	3.92	3.92	13.73	23.53	11.76
First	13.04	13.04	13.04	8.70	4.35	0	0	13.04	21.74	13.04

Table 5.17: The Percentages of the Positive Critical Thinking Indicators of Each of the Eight Conjunctions

There were overall 10 positive critical thinking indicators used to assess the critical thinking performance of participants in the four threaded discussion. Based on Table 5.17 above, the first similarity observed is R+(Relevant statement), AC+ (Clear, unambiguous statement), N+ (Novelty), and L+ (Linking of ideas or generating new data from information collected) indicators are the four most frequently awarded positive critical thinking indicators for the instances of all the eight conjunctions. Thus, it seems that the participants faced no problems in introducing relevant (R+), clear (AC+), novel (N+) and coherent (L+) ideas into the threaded discussion by using the eight conjunctions. The second similarity observed is the O+ (Referring to outside knowledge/ experience), P+ (Discussing the practicality of new ideas and suggesting solutions) and C+ (Critical assessment or evaluation of others' or own contribution) indicators are the least awarded positive critical thinking indicators for all the eight conjunctions.

In terms of the assignment of the C+ (Critical assessment or evaluation of others' or own contribution) indicator, all the seven conjunctions were found in the instances

where the C+ (Critical assessment or evaluation of others' or own contribution) indicator was awarded, except the temporal conjunction 'first', where it was found in the instances where no C+ indicator was awarded. Based on Table 5.17, It is apparent that the adversative conjunction category that consists of 'but' and 'however' reflected the C+ (Critical assessment or evaluation of others' or own contribution) indicator more frequently than the other conjunction categories. This is probably because, both the adversative conjunction 'but' and 'however' were used by the participants to introduce substantiated disagreement or partial disagreement and to refute by introducing justified, clear and relevant statements that contradicted their peers' or their own previous comments. All these were considered by the researcher as the evidence of the participants having critically evaluated the previous postings of their peers. However, this does not mean that all instances of 'but' and 'however' would be awarded C+ (Critical assessment or evaluation of others' or own contribution) indicator. (See examples 5.2.4.9 which were taken from the section 5.2.4.2.1).

Example 5.2.4.9 extracted from the RM 1 threaded discussion transcript

> *We all know that writing literature review should not be 'copy and paste' **but** it is usually an evaluative report of the found information from others work. (R+, I+, AC+, L+)*

Based on example 5.2.4.9 above, the codes R+ (Relevant statement), I+ (Important statement) and AC+ (Clear, unambiguous statement) and L+ (Linking of ideas and generating new interpretation from the data given) were assigned to the adversative conjunction 'but' instance. However, it was not awarded the C+ (Critical assessment or evaluation of others' or own contribution) indicator. This is because what is the stated by the participants could be considered as general knowledge or a known fact to the other participants.

Example 5.2.4.10 extracted from the RM 2 threaded discussion transcript

> *To highlight, in Situation A, the interviewer actually gave his or her answer and the interviewee ̆guessed"that the interviewer got the point. **But** what exactly is the point? (R+, C+, AC+, NL+, W+,L+)*

Unlike example 5.2.4.9 above, example 5.2.4.10 (taken from section 5.2.4.2.1) was awarded the code C+ (Critical assessment or evaluation of others' or own contribution) indicator, besides other indicators such as R+ (Relevant statement), AC+ (Clear, unambiguous statement), NL+ (Learner brings new things in) and W+ (Widen the discussion) and L+ (Linking of ideas and generating new interpretation from the data given). This is because the participants produced a new insight after she evaluated the given interview scenarios stated in the RM 2 threaded discussion topic by asking what the point the interviewer of the scenario A actually made. She rebutted the fact that the interviewer actually got the authentic answer from the interviewee and she requested further explanation or rationalization. Thus, the instance of the adversative 'but' in example 5.2.4.10 above was awarded the C+ (Critical assessment or evaluation of others' or own contribution) indicator.

As aforementioned, the use of other conjunctions also indicated the presence of the C+ (Critical assessment or evaluation of others' or own contribution) indicator but it was not as frequently as the one signalled by the adversative conjunction 'But' and 'However'. For instance, example 5.2.4.2 which was taken from the 5.2.4.1.1 section was assigned the C+ (Critical assessment or evaluation of others' or own contribution)indicator. Example 5.2.4.2 shows the instance of the additive conjunction 'also' which was assigned the C+ (Critical assessment or evaluation of others' or own contribution) indicator.

Example 5.2.4.2 extracted from the SLA 1 threaded discussion transcript

*You **also** highlighted an interesting point about how the learning process of students could be affected by how they were treated by their teachers. (R+, C+, AC+, L+) Yes, a teacher who is strict, forceful and harsh will undoubtly cause the learner to feel more pressure and stress resulting in them not being able to learn as much as they could as this causes they level of anxiety to increase. (C+, R+, AC+, L2+,W+, OE+,NL+).*

Based on example 5.2.4.2 above, the instance of 'also' was awarded the C+ (Critical assessment or evaluation of others' or own contribution). This is because the participant, after critically pondering on his peer's previous posting (C+), pinpointed out the interesting point his peer had stated. The participant then elaborated on it further by adding his comment which seems to arise from his personal experience as a second language learner. The participant's personal comment showed that the participant actually agreed with his peer's viewpoints. This instance of 'also' was awarded the R+ (Relevant statement) and AC+ (Clear and unambiguous statement) as well as the content it conveyed was clear and relevant to the matter under discussion.

Next, though the use of the other conjunctions also showed the presence of JS+ (Justifying solutions or judgments) indicator except for the temporal conjunction 'first', the percentage of JS+ (Justifying solutions or judgments) was the highest for the causal conjunction 'because'. The reason is that the participants tended to use the causal conjunction 'because' to introduce reasons that supported the participants' previous claims, thus providing justification for the claims made.

Example 5.2.4.21 extracted from the RM1 threaded discussion transcript

*Thus, it contradicts with the Taylor's statement "A literature review is a piece of discursive prose, not a list which describes or summarizes one piece of literature review after another.....' This is **because** the first part usually consists of description and summarization of the works done by others. (JS+, R+, NI+, W+, AC+, L+ and C+)*

Based on the example 5.2.4.21 which was taken from the section 5.2.4.3.1, the causal conjunction 'because' was used to state the reason why the viewpoint held by the participant differed from Taylor's statement in terms of the writing of literature review. The code JS+ (Justifying solutions or judgments) was awarded besides other codes such as R+ (Relevant statement), NI+ (New ideas for discussion), W+ (Widen the discussion), AC+ (Clear, unambiguous statement), L+ (Linking of ideas and generating new interpretation from the data given) and C+ (Critical assessment or evaluation of others' or own contribution).

Again, the causal conjunction 'because' was not the only one that could indicate the presence of JS+ (Justifying solutions or judgments) indicator in the data. The use of other conjunctions may also signal the presence of JS+ (Justifying solutions or judgments) indicator but in a less frequent way (See example 5.2.4.18 below). The example 5.2.4.18 below was taken from the section 5.2.4.2.2. It shows the instance of adversative conjunction 'however' which was awarded the C+ (Critical assessment or evaluation of others' or own contribution) indicator.

Example 5.2.4.18 extracted from the SLA 1 threaded discussion transcript

*Based on my own experience as a second language learner, there were times when my anxiety level was high. **However**, it was this anxiety that prompt me to be well-prepared and give my best. (JS+, OE+, R+, NL+, W+, L+, AC+,*

L+,C+). Anxiety can be a source of motivation rather than a cause for failure.

Referring to example 5.2.4.18 above, the instance where 'However' was used at the initial position was awarded the JS+ indicator. This is because this instance of 'However' actually could be seen as the reason why the participants stated that anxiety could motivate her instead of letting her fail in acquiring the second language.

In other words, the instances of the adversative conjunction 'but' and 'however' were likely to indicate the presence of C+ (Critical assessment or evaluation of others' or own contribution) indicator while the instances of causal conjunction 'because' were likely to signal the presence of JS+ (Justifying solutions or judgments) indicator. The reasons why the instances of adversative conjunction 'but' and 'however' show the presence of C+ (Critical assessment or evaluation of others' or own contribution) indicator more frequent than the instances of the other conjunctions was it seems that the participants seldom used the other conjunctions in a context where they could also exhibited the C+ (Critical assessment or evaluation of others' or own contribution) indicator. Thus, their preference of using only certain conjunctions for instance, to show opposing points and to express disagreement into the threaded discussion and their weaknesses in expressing critical evaluation skills especially through the use of conjunctions may influence the assignment of C+(Critical assessment or evaluation of others' or own contribution) indicator. The same argument can be applied in the case of the assignment of JS+ (Justifying solutions or judgments) indicator. Using the causal conjunction 'because' to state reason or to justify their claims could be seen as a norm among English language users. In this study, it is apparent that the participants showed the tendency of using the causal conjunction 'because' to provide justification or reasons explicitly. Of course, in the data, it is found that they also used other alternatives to state reasons and to provide justification explicitly such as through the use of the phrases 'the reason is' or 'the reason why' but only in a very small amount. Besides stating the reasons or providing

justification explicitly, sometimes the participants of this study also stated the reasons or justifications implicitly in which the readers had to infer from the surrounding textual information in order to recognise the reason or justification stated by the participants.

In terms of the use of the eight conjunctions to state reason, it is noticeable that the participants seldom use the other seven conjunction except 'because' in a context where they could express reasons or justification. For instance, temporal conjunctions such as 'first, second' were not used in the context where they helped in revealing the reasons. Examples such as 'Firstly, the reason is' , 'Secondly, it is because of' or ' The first reason is' were not found in the data of this study, causing the temporal conjunction 'first' to show zero presence of JS+ indicator. This may be caused by firstly, the participants' preference of certain style of organising ideas and secondly, they had limited knowledge regarding how they can express the same semantic relation such as providing reason using different conjunctions.

Other than the adversative conjunctions 'but', 'however' and the causal conjunction 'because', the use of the other five conjunctions seems unlikely to signal the presence of any specific positive critical thinking indicators. This is because, for instance, R+ (Relevant statement) indicator could be assigned to any instances of conjunctions as long as the instances were relevant to the topic of discussion, so the use of different conjunctions did not influence the assignment of R+ (Relevant statement) indicator. The other positive critical thinking indicator such as L+ (Linking of ideas or generating new data from information collected) could also be assigned to all the instances of conjunctions as all the conjunctions help in linking the ideas in the postings. Thus again, it seems that the assignment of L+ (Linking of ideas or generating new data from information collected) indicator was also not influenced by the use of any specific conjunctions because as long as they were used effectively to link the ideas in the postings by the participants, the instances of the conjunctions would be marked as L+

(Linking of ideas or generating new data from information collected) regardless of the choice and the category of conjunction used.

In the next section, the overview of the negative critical thinking indicators' coding results will be presented.

5.2.4.6 Overview of the coding results of negative critical thinking indicators

Negative CT indicators vs Conjunction	R-	I-	N-	O-	P-	JS-	C-	AC-	L-	W-
Also	4	1	3	0	1	0	1	4	3	5
But	2	0	1	0	0	1	2	3	1	2
However	1	0	1	0	0	0	0	1	0	1
So	3	1	0	0	1	1	0	2	0	1

Table 5.18: The Frequency of the Negative Critical Thinking Indicators of Each Conjunction 'Also', 'But', 'However' and 'So'

Next, based on the results tabulated in Table 5.18 above, when the assignment of the negative critical thinking indicators was concerned, only some of instances of the 4 conjunction 'also', 'but', 'however' and 'so' were awarded negative critical thinking indicators whereas none of the instances of the other four conjunction namely, 'and', 'because', 'then' and 'first' portrayed negative criticalness. Based on the definitions given to the negative critical thinking indicators (Refer to Newman et.al content analysis framework (1995) presented in Chapter 3), there are many reasons why a statement could be awarded negative critical thinking indicators. For instance, in this study, the first reason why some of the instances of the eight conjunctions were awarded negative critical thinking indicators is when the coders failed to understand the messages the participants tried to convey as the sentences where the conjunctions were found may be unclear (AC-) in their meaning due to grammatical errors made (Refer to example 5.fi2.4.15 under the section 5.2.4.2.1). The second reason being was the

instances of the eight conjunctions were considered as irrelevant(R-) or faulty (N-) to the context of the threaded discussions (Refer to example 5.2.4.3 under the section 5.2.4.1.1 and example 5.2.4.20 under the section 5.2.4.2.2). The other negative critical thinking indicators such as JS- (Unjustified statement), P- (Discuss in vacuum), C- (Uncritical acceptance or unreasoned rejection), W- (Narrowing the discussion) and L- (Repeating information without making inferences or offering an interpretation, or stating that one shares the ideas or opinions stated, without taking these further or adding any personal comments)were also present in the data of this study. O- (Squashing attempts to bring in outside knowledge or sticking to prejudice or assumptions) indicator was the only negative critical thinking indicator that was not present at all in the data of this study.

It seems that the use of conjunctions alone did not cause the sentences to be coded negatively except in the cases where the conjunctive items were used wrongly to the extent that it hampered the understanding of the coders or the wrong use of conjunction caused the sentences to become irrelevant to the whole context of threaded discussion. However, in the data of this study, there were no errors detected in terms of the use of the eight conjunctions. Thus, it could be inferred that the assignment of the negative critical thinking indicators was not caused by the wrong use of conjunctions. Rather, the assignment of negative critical thinking indicators seems to be influenced by firstly, whether the instances of the conjunctions conveyed clear and relevant to the context of threaded discussion, secondly, whether the instances of the conjunctions conveyed justified message, thirdly, whether the instances of the conjunctions were the evidences of critical evaluation of the participants of this study.

In the next chapter, the overview of the results of all three research questions, theoretical implication and pedagogical implication will be outlined. Recommendations for the future study also will be presented.

CHAPTER 6: SUMMARY AND CONCLUSION

6.1 Introduction

The goals of this study were to 1) determine the frequency of each type of cohesive devices, i.e. reference, substitution, ellipsis, conjunctions used by participants in threaded discussions, 2) determine the students' critical thinking abilities by using the content analysis tool established by Newman et .at in 1995, and to 3) delve into the relationship, if any, the use of the cohesive devices in reflecting the critical thinking performance of participants. The overview of findings, the implications of this study and recommendations for future study will be discussed in this chapter as well.

6.2 Overview of the Findings

In terms of the frequency of each type of cohesive devices, generally, it was found that the frequency of the reference was the highest, followed by the conjunction, substitution and ellipsis. These findings were presumably caused by several reasons such as the participants' familiarity with the cohesive devices, their preference in using certain type of cohesive devices to convey their messages and also the nature of the task itself which required the participants to involve in certain degree of argumentation.

In terms of the results gained after using the Newman et.al content analysis method (1995) to assess the critical thinking in all the four threaded discussion transcripts, it is noticeable that in all the four threaded discussion sessions, the participants generally were able to contribute relevant (R+ positive critical thinking indicator), clear and unambiguous (AC+ positive critical thinking indicator), novel (N+ positive critical thinking indicator) and important (I+ positive critical thinking indicator) ideas into the threaded discussion. The participants, especially those from second language acquisition course, had the tendency to draw on their personal experience and integrate it into the

threaded discussion (O+ positive critical thinking indicator). Other than that, they were able to produce coherent postings. However, the participants from both courses seem not to be able to exercise their critical evaluation skills (C+ positive critical thinking indicator). In addition, looking at the critical thinking ratio table for each threaded discussion transcript, it was found that the performance of the participants from Research Methodology course improved as they progressed from Topic 1 threaded discussion (RM 1 transcript) to Topic 2 threaded discussion. This could be due to the experience they gained from their first topic of threaded discussion. However, a slight drop in performance was observed when the participants of Second Language Acquisition course progressed from Topic 3 threaded discussion (SLA 1) to Topic 4 threaded discussion (SLA 2). The time where SLA 2 threaded discussion topic was launched was near the end of the semester and at that time the participants from SLA course were rushing to meet the deadline of other assignments and it may have caused them to not able to contribute more quality inputs into the SLA 2 threaded discussion.

In terms of the use of first personal singular pronoun 'I' in the context of the threaded discussion, it seems that the pronoun 'I' was used frequently with the verbs such as 'agree', disagree', 'think' and 'believe' to convey the participants personal viewpoints, stance taken towards the particular matter during the threaded discussion. The instances where the pronoun 'I' had been detected were awarded the positive critical thinking indicators if they were relevant, clear, new and substantiated statements which helped in widening the scope of discussion. There were several instances where the pronoun 'I' had been found, were assigned the negative critical thinking indicators such as C-, L-, I-, N-and W-. This happened under the condition where the participant simply agreed or disagreed with his peers' comments and repeated the information contributed by others without providing his own interpretation or reasons as to why he agreed or disagreed with others' comments.

When the use of substitution and ellipsis is concerned, it is apparent that the correct use of these two cohesive devices was important as it made the instances clear in meaning and relevant to the overall context of discussion. However, it is evident that the assignment of other positive critical thinking indicators, other than the clear (AC+) and relevant (R+) indicators, was not determined by the correct use of substitution and ellipsis only.Rather, it is the content of the sentences where substitution and ellipsis cohesive devices were found determined the assignment of other critical thinking indicators.

Generally, most of the instances of all the eight conjunctions, i.e. also, and, but, however, because, so, then and first were marked R+ (Relevant statement), AC+ (Clear, unambiguous statement), N+(Novelty), L+ (Linking of ideas/generating new data from information collected), W+ (Widen the discussion) indicators. The least assigned positive critical thinking indicators for most of the instances of all the eight conjunctions were recognized as the I+ (Important statement), O+(Referring to outside knowledge/ experience), P+(Discussing the practicality of new ideas and suggesting solutions), JS+(Justifying solutions or judgements) and C+(Critical assessment of others' or own contribution) indicators. It was observed that C+ (Critical assessment of others' or own contribution) indicator was more frequently assigned to the instances where adversative conjunction 'But' and 'However' were detected. The reason is the participants of the four threaded discussion normally used the two adversative conjunctions to propose their disagreement or comments that contradicted their peers' and their own previous comments after they critically pondered on and assessed others' and their own comments. So, the instances of adversative conjunction 'But' and 'However' reflected the presence of the C+ (Critical assessment of others' or own contribution) indicators more frequently than the other conjunctions. Next, it was also found that the JS+ (Justifying solutions or judgements) indicator was more frequently

assigned to the sentences where causal conjunction 'because' was found. This was due to the fact that the causal conjunction 'because' was used widely to provide reasons in order to justify the participants' claims. The assignment of the other positive critical thinking indicators other than the C+ (Critical assessment of others' or own contribution) and JS+ indicators, however, was not influenced by the choice and category of the conjunction used. Instead, the coding decision of the other 8 positive critical thinking indicators i.e. R+ (Relevant statement), I+(Important statement), N+ (Novelty), O+(Referring to outside knowledge/experience), P+(Discussing the practicality of new ideas and suggesting solutions), AC+(Clear, unambiguous statement), L+(Linking of ideas/generating new data from information collected), W+ (Widen the discussion) indicators depended on whether the coders could comprehend the sentences where the conjunctions were found without difficulty. Similarly, the coding decision of negative critical thinking indicators was influenced by the overall context of the threaded discussion where the conjunctions' instances were detected rather than depending solely on the use of the conjunctions itself. The number of the instances of the 8 conjunctions which exhibited the negative critical thinking indicators was considered small as compared to the number of instances of the 8 conjunctions which exhibited positive critical thinking characteristics. This may be due to the fact students were instructed to respond to postings with adequate rationalisation and explanation. In fact, the instructor reminded the student not to blindly agree or disagree with statements without rationalisation. Thus, indirectly this may have resulted in relatively fewer instances of negative critical thinking indicators being found in the postings.

6.3 Theoretical Implications

This study adopted Halliday and Hasan (1976) taxonomy of grammatical cohesion when examining the frequency of each of the cohesive devices. The researcher followed the classification of the cohesive devices and also the cohesive items allocated for each cohesive devices as presented in Halliday and Hasan (1976) Taxonomy of Grammatical Cohesion. However, when it came to the differentiation of intersentential and intrasentential conjunctions and although Halliday and Hasan (1976) claimed that intersentential conjunction contributed to cohesion more significantly than intrasentential conjunction, it was noted that intersentential conjunctions were hardly found in the data of this study. This may be due to firstly, the preferences of the participants as language users and secondly, their familiarity with both the intersentential and intrasentential use of conjunction. For instance, it was assumed most of the participants of this study were taught not to start a sentence with conjunction like 'And'. Thus, it is hardly to find any intersentential 'And' in this data. In addition, in the data of this study, it was found that the intersentential use of conjunction mostly comprised the use of conjunctive adverbials such as 'However' in the beginning of the sentences. In addition, the conjunction lists presented by Halliday and Hasan (1976) is not an exhaustive list of conjunction as it did not include most of the subordinating conjunctions.

Next, this study also adopted the Newman et. al content analysis framework (1995) to assess the critical thinking in all the four threaded discussion transcripts. Newman et.al (1995) came up with a coding scheme which consists of positive and negative critical thinking indicators. The positive and negative critical thinking indicators were then could be divided into 10 broad critical thinking categories. Though Newman et.al content analysis method (1995) was used to quantify the critical thinking performance,

it was a laborious task to code the threaded discussion transcripts based on the whole list of positive and negative critical thinking indicators as they were many in numbers. Some of the indicators were found to be ambiguous and overlapped in their meanings, rendering the task of coding difficult. For instance, within the broad category of positive critical thinking N+(Novelty), there were 5 subcategories of N+ indicators namely the NP+ (new problem related info), NL+ (Learner brings new things in), NI+(New ideas for discussion), NQ+ (Welcoming new ideas) and NS+ (New solutions to the problems). The coders of this study found it hard to differentiate among NL+ (Learner brings new things in), NI+(New ideas for discussion), NS+(New solutions to the problems) and NP+(New problem -related information) as NI+(New ideas for discussion), NS+ (New solutions to the problems) and NP+ (New problem-related information) could be seen as NL+(Learner brings new things in). In addition, this problem was also identified across the categories of critical thinking indicators. For instance, the negative critical thinking indicator NI- (Repeating what has been said) under the N- broad category of negative critical thinking overlapped with the negative critical thinking indicator L- (Repeating information without making inferences or offering an interpretation) under the L- broad category of negative critical thinking. Some of critical thinking indicators were also found to be subjective such as I+ (important statement) and N+ (Novelty). This caused problems when it came to interrater reliability issue. Although Newman at.al (1995) stated that it was impossible to look for an ideal reading of interrater reliability when using their scheme to code data, the current research, however, looked for interrater reliability reading. It was found that code such as I+ was subjective and the researcher and the other coder could hardly achieve agreement on whether the statements should be and should not be awarded the I+ (Important statement) code. Smith (2008) pointed out the several problems faced by her students when using the Newman et.al (1995) content analysis scheme to code their online discussion content. Though she agreed that

this scheme was useful due to its comprehensiveness in terms of the positive and negative critical thinking indicators listed and its benefits to researchers who would like to quantify critical thinking performance, it was time consuming for her students to code the online discussion content following this scheme. In addition, her students also raised some issues during the coding process. One of the issues raised was if the idea was novel (N+), should it also be coded as W+ (Widen the discussion). The other problem observed was when her students found it hard to apply certain codes such as P+ (Practical Utility) as they could not understand the meaning; they seldom assigned the P+ (Practical Utility) code to their online discussion content. Smith (2008) also found that this scheme might not cover all the other critical thinking characteristics identified by her students. The experiences shared by both the current researcher and Smith (2008) indicated that the Newman et.al content analysis scheme (1995) can be useful in quantifying the depth of thinking. Despite that, employing Newman et.al content analysis scheme (1995) may still lead to some problems especially the ones concern with coding decision. Therefore, these problems have to be resolved in order to obtain a more reliable coding results.

6.4 Pedagogical Implications

Since acquiring critical thinking skills is deemed as important for the students of tertiary education, the students and their instructors should all play their roles in creating an environment that encourages critical thinking. This following sub sections will shed lights on how the students and instructors of higher education can benefit from this study.

6.4.1 Students of the tertiary education

Students from the tertiary education which include both the undergraduate or postgraduate students should realize the importance of being able to think critically and work towards the goal of becoming critical thinkers. They should be exposed to e-learning and be introduced to collaborative online learning activities such as threaded discussion that could help to sharpen their critical thinking skills. Students should also be exposed to the schemes or methods used to assess their critical thinking skills in online learning environment as in this case the Newman et.al (1995) content analysis scheme. This is to ensure that they know how their online assignments would be assessed and the critical thinking characteristics that their online assignment is expected to exhibit. For instance, if they were introduced to the Newman et.al content analysis scheme (1995), they would realize that their assignment should be a coherent piece of writing where relevant, novel, clear ideas were found and they also need to be aware that the information included in their assignment should be the outcome of their critical assessment and they need to justify their claims.

They should also be aware of the importance of the effective use of the four cohesive devices namely the reference, substitution, ellipsis and conjunction. This is because the effective use of cohesive devices can help them in creating sound and coherent arguments by linking the ideas logically. They should also be exposed to the negative critical thinking characteristics when planning content in online assignments.

6.4.2 Instructors of the higher education course

In this study, it was found that online learning activities specifically threaded discussion mediated via Moodle, a learning management system can be a good avenue to be explored by instructors in designing and carrying out activities that allow students to express their viewpoints as well as critiques. Threaded discussion affords students to have ample time to reflect and deliberate on the issues at hand. Therefore, the instructors of the higher education can consider utilizing the learning management systems to carry out collaborative, online learning activities that will help the students to improve their critical thinking skills. The instructors perhaps can draw the attention of students to the use of linguistic elements, particularly the use of cohesive devices in facilitating the flow of ideas. For instance, the instructors can show to the students how the use of conjunction can impact the writing quality by comparing writing samples. The instructor can also show the students the way they can employ the first personal pronoun 'I' in conveying personal but substantiated comments and stance. The instructors can also do the same thing when it comes to the use of substitution and ellipsis. Helping the students to acquire the skills of using linguistic elements such as conjunction, pronoun 'I', substitution and ellipsis effectively in the threaded discussion context is crucial as these skills help them to argue logically and improve their critical thinking ability. The instructors can motivate the students to think critically by gauging the content of students' assignments in terms of critical thinking performance and providing feedback to the students in regards to their critical thinking performance.

In the next section, recommendations for further research will be presented in the section below.

6.5 Recommendations for Future Study

Under this section, several recommendations were presented. Recommendations were given in relation to the sample size and the framework used to assess critical thinking. The researcher also recommended several areas of research that future researcher may undertake in order to understand how the use of language may reflect critical thinking ability.

6.5.1 Increase of the sample size

For the future study, the sample size should be increased in order to gather more instances of cohesive devices, specifically the instances of conjunctions for investigating how the use of conjunction may reflect the critical thinking characteristics. It was found that the number of the use of the substitution and ellipsis was little in the data of this study. It may suggest that the substitution and ellipsis cohesive devices could be left out for the researchers who wish to study how the use of cohesive devices may reflect critical thinking in the future. And since the Halliday and Hasan (1976) conjunction list was not an exhaustive list as it does not cover subordinating conjunctions, future researcher may combine the Halliday and Hasan (1976) conjunction list with the other lists suggested by other grammarians in order to increase the variety and number of conjunctions for the future study.

6.5.2 Modification of Newman et.al content analysis (1995) framework

As aforementioned, there were several problems found when using Newman et.al content analysis framework (1995) to code the data. For instance, the I+ (Important statement) indicator was subjective and it was difficult to decide whether a statement should be code as I+ (Important statement) for both the researchers and their interraters. In order to solve this problem, future researchers perhaps can elaborate further on the

features of the statement which could be awarded the I+ (Important statement) code so that the interrater could make better judgment when awarding the I+ (Important statement) code. Besides that, future researchers can also omit or ignore the codes which seem to be overlapped with one another in terms of their meanings. According to Cook (2008), modification should be made when the researchers decide to use the Newman et.al content analysis scheme (1995) based on the aim of their study. She suggested that, for example, if the aim of the coders is to find out where the knowledge comes from, then the coders should take into account all the sub categories of O+(Referring to outside knowledge/experience),. However, if the coders' aim was only to assess the critical thinking and to find out the critical thinking characteristics reflected in their data, then the sub categories under the broad O+ (Referring to outside knowledge/experience), positive critical thinking indicator could be disregarded. Thus, future researchers should try to modify the Newman et.al content analysis scheme (1995) (1995) based on their own need instead of using all the indicators proposed by Newman et. al (1995).

6.5.3 Instructors' feedback and interview with the participants

Since this study did not delve into the possible influence of instructors' feedback may have on the overall critical thinking performance, future researchers can consider looking into how feedback from the course instructors may affect the critical thinking performance of participants in threaded discussion. In addition, future researchers can also conduct an interview sessions with their participants to find out the factors that may affect their critical thinking performance in threaded discussion.

6.5.4 Coherence aspect of the online postings

The focus of this study is on the use of cohesive devices and how it may reflect the critical thinking performance especially when the use of conjunction is concerned and this study did not look into the coherence aspect of the threaded discussion and how it may affect the critical thinking performance. Therefore, in the future, the researchers may study the coherence aspect of threaded discussion and how it may reflect the critical thinking performance.

6.5.5 Other factors that may influence critical thinking performance

This study aimed to investigate the use of the four cohesive devices in threaded discussion and how it may reflect the participants' critical thinking. The assessment of critical thinking was based on the critical and uncritical thinking indicators suggested by Newman et.al (1995). Future researchers could consider investigating other factors such as cognitive development or learning strategies of the participants and how these factors may affect critical thinking performance of the participants in threaded discussions or other types of academic writing.

6.6 Conclusion

This study investigated the use of cohesive devices and how the use of conjunction in particular may reflect critical thinking. In terms of the frequency of use of each of the cohesive devices, it was found that most frequently used cohesive device was reference, followed by conjunction, substitution and ellipsis. The Newman et.al content analysis scheme (1995) was used to gauge the critical thinking performance of the threaded discussions while Halliday and Hasan Taxonomy of Grammatical Cohesion (1976) was adopted to study the cohesive devices found in the threaded discussion. It was found

that threaded discussion could be used to promote critical thinking among the participants of this study.

The instances where the pronoun 'I' was used seems to link to personal agreement, disagreement, viewpoints through the use of the phrases such as 'I agree', 'I disagree', 'I think' and 'I believe'. The positive critical thinking indicators were awarded to the instances of pronoun 'I' if the instances were substantiated agreements, disagreements and viewpoints. Negative critical thinking indicators were given to the instances of pronoun 'I' if the instances proved to be unsubstantiated agreements, disagreements and viewpoints.

In relation to the use of substitution and ellipsis, it was found that the correct use of substitution and ellipsis had been pivotal in making the sentences clear in meaning (AC+) and relevant (R+) to the overall context of threaded discussion. This is because the incorrect use of substitution and ellipsis caused problems to the comprehension of the content and this may result in these instances be assigned with negative critical thinking indicators. However, the correct use of both substitution and ellipsis did not play a determining role in affecting the coding decision that was concerned with the assignment of other positive critical thinking indicators, other than R+ (Relevant statement) and clear (AC+) indicators. The assignment of other positive critical thinking indicators other than R+ (Relevant statement) and clear (AC+) indicators relied upon the content of the instances where substitution and ellipsis had been found.

The instances of the adversative conjunctions 'but' and 'however' indicated the highest presence of the C+ (Critical assessment or evaluation of own or others' contributions) positive critical thinking indicator while the causal conjunction 'because' indicated the highest presence of JS+ (Justifying solutions or judgments) positive critical thinking indicator. In relation to the potential use of threaded discussion in stimulating critical

thinking among the learners, the instructors of the higher education institutions can therefore consider using threaded discussion mediated via a learning management system to engage the students in a collaborative learning activity that will promote critical thinking among the students.

In the future, the instructors can consider assessing the content of students' assignments in terms of critical thinking performance by employing rubrics that are designed specifically for assessing critical thinking. One of the means that may assist the instructors to detect the critical thinking aspects of students' work can be the use of cohesive devices such as conjunctions. This can then act as a complement to the conventional rubrics which are used to measure the overall writing quality of students' assignments.

BIBLIOGRAPHY

Abrams, Z. L. (2003). The effect of synchronous and asynchronous CMC on oral performance in German. *The Modern Language Journal, 87*(2), 157-167.

Afolabi, F., & Akinbobola, A. O. (2009). Constructivist Problem Based Learning Technique and the Academic Achievement of Physics Students with Low Ability Level in Nigerian Secondary Schools. *Eurasian Journal of Physics and chemistry education, 1*(1), 45-51.

Al-Jarf, R. S. (2001). Processing of cohesive ties by EFL Arab college students. *Foreign Language Annals, 34*(2), 141-151.

Al-Zaidiyeen, N. J., Leong, L. M., & Fong, S. F. (2010). Teachers' attitudes and levels of technology use in classrooms: The case of Jordan schools. *International Education Studies, 3*(2), P211.

Alacon, J. B., & Morales, K. N. S. (2011). Grammatical cohesion in students' argumentative essays. *Journal of English and Literature, 2*(5), 114-127.

Alagozlu, N. (2007). Critical thinking and voice in EFL writing. *Asian EFL Journal, 9*(3), 118-136.

Alexander, M. E., Commander, N., Greenberg, D., & Ward, T. (2010). Using the four questions technique to enhance critical thinking in online discussions. *Journal of Online Learning and Teaching, 6*(2), 409-415.

Alexander, P., Dawson, M. C., & Ichharam, M. (2006). *Globalisation and new identities: a view from the middle*: Jacana Media.

Amin Khandaghi, M., & Hamideh, P. (2012). Critical thinking disposition : A neglected loop of humanities curriculum in higher education. *Cypriot Journal of Educational Sciences, 7*(1), 1-13.

Arend, B. (2009). Encouraging critical thinking in online threaded discussions. *The Journal of Educators Online, 6*(1).

Bai, H. (2009). *Students' Cognitive Thinking in Online Discussion.* Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.

Baron, N.S. (2010). Discourse structures in instant messaging: The case of utterance break. *Language@Internet*, 7(4).

Barzdžiukienė, R., Urbonienė, J., & Klimovienė, G. (2006). Developing critical thinking through cooperative learning. *Kalbų Studijos*(9), 77-84.

Bell, D. (1998). Cancellative discourse markers: A core/ periphery approach. *Pragmatics, 8*(4), 515-541.

Bell, D. (2007). Sentence- initial And and But in academic writing *Pragmatics, 17*(2).

Berelson, B. (1952). Content analysis in communication research.

Bernama. (2012). Education system not producing thinking garduates, say expert, *The Star Newspaper*. Retrieved from https://mystarjob.com/articles/story.aspx?file=/2012/3/5/mystarjob_news/20120 305105143&sec=mystarjob_news

Björk, L. A., Brauer, G., Rienecker, L., & Jorgensen, P. S. (2003). *Teaching academic writing in European higher education*: Kluwer Academic Pub.

Blake, R. (2000). Computer mediated communication: A window on L2 Spanish interlanguage. *Language Learning & Technology, 4*(1), 120-136.

Brindley, J., Blaschke, L. M., & Walti, C. (2009). Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distance Learning, 10*(3).

Celce-Murcia, M., & Larsen-Freeman, D. (1999). *The grammar book: An ESL/EFL teacher's course* (2 ed.).

Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. *Vygotsky's educational theory in cultural context*, 39-64.

Chawwang, N. (2008). *An investigation of English reading problems of Thai 12 th-grade students in Nakhonratchasima educational regions 1, 2, 3, and 7.* Srinakharinwirot University.

Cheong, C., Bruno, V., & Cheong, F. (2012). Designing a mobile-app-based collaborative learning system. *Journal of Information Technology Education: Innovations in Practice, 11*(1), 94-119.

Cheong, C. M., & Cheung, W. S. (2008). Online discussion and critical thinking skills: A case study in a Singapore secondary school. *Australasian Journal of Educational Technology, 24*(5), 556-573.

Cheung, W. S., Hew, K. F., & Ling Ng, C. S. (2008). Toward an understanding of why students contribute in asynchronous online discussions. *Journal of Educational Computing Research, 38*(1), 29-50.

Chou, P. N., & Chen, W. F. (2010). Chinese students' perceptions of online learning in Western discussion boards: A cultural perspective. *International Journal of Instructional Technology & Distance Learning, 7*(2), 35-48.

Cook, D., & Ralston, J. (2003). Sharpening the focus: Methodological issues in analysing online conferences. *Technology, Pedagogy and Education, 12*, 361-376.

Cook, N. A. (2008). *Online discussion forums: A strategy for developing critical thinking in middle school students.* Doctor of Philosophy, State University of New York, Buffalo.

Corich, S., Kinshuk, H. L., & Lynn, M. (2004). Assessing discussion forum participation: in search of quality. *International Journal of Instructional Technology and Distance Learning. TEIR Center, Duquesne University, Pittsburgh.*

Cosgrove, R. (2011). Critical thinking in the Oxford tutorial: a call for an explicit and systematic approach. *Higher Education Research & Development, 30*(3), 343-356.

Creswell, J. W. (2011). Controversies in mixed methods research. *The Sage handbook of qualitative research*, 269-283.

Dastjerdi, H. V., & Samian, S. H. (2011). Quality of Iranian EFL Learners' Argumentative Essays: Cohesive Devices in Focus. *Mediterranean Journal of Social Sciences, 2*(2), 66-76.

De Wever, B., Van Keer, H., Schellens, T., & Valcke, M. (2007). Applying multilevel modelling to content analysis data: Methodological issues in the study of role assignment in asynchronous discussion groups. *Learning and instruction, 17*, 436-437. doi: 10.1016/j.learninstruc.2007.04.001

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the education process.* Boston: Heath.

Dixon, R. M., & Verenikina, I. (2007). *Towards inclusive schools: An examination of socio-cultural theory and inclusive practices and policy in new South Wales DET schools.* Paper presented at the Learning and Socio-cultural Theory: Exploring Modern Vygotskian Perspectives International Workshop 2007.

Ellis, A. (2001). *Student-centred collaborative learning via face-to-face and asynchronous online communication: What's the difference?* Paper presented at the 18th ASCILITE conference, Melbourne.

Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational leadership, 43*(2).

Ennis, R. H. (1993). Critical thinking assessment. *Theory into practice, 32*(3), 179-186.

Facione, P. (1990). The delphi report. *Committee on pre-college philosophy. American Philosophical Association*.

Fahim, M., Bagherkazemi, M., & Alemi, M. (2010). The relationship between test takers' critical thinking ability and their performance on the reading section of TOEFL. *Journal of Language Teaching and Research, 1*(6).

Fahy, P. J. (2005). Two methods for assessing critical thinking in computer-mediated communications (CMC) transcripts. *International Journal of Instructional Technology and Distance Learning, 2*(3), 13-28.

Flores, E. R. (2006). Thinking skills reflected in the argumentative essays of freshman college students: A descriptive analysis. *The Asia Pacific-Education Researcher, 16*(1), 33-34.

Gao, L. H. (2012). *Examining argumentative coherence in essays by undergraduate students in English as a foreign language in Mainland China and their English speaking peers in the United States.* Doctoral Doctoral Dissertation, Florida International University, Miami. FIU Electronic Theses and Dissertation database

Garrison, D. R. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. *Adult Education Quarterly, 42*(3), 136-148.

Garrison, D. R., & Anderson, T. (2003). *Elearning in the 21st century: A framework for research and practice.* London: Routledge/Falmer.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment:Computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of distance education, 15*(1), 7-23.

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues and future directions. *Internet & Higher Education, 10*, 157-172. doi: 10.1016/j.iheduc.2007.04.001

Gieve, S. (1998). A Reader Reacts…. *Tesol Quarterly, 32*(1), 123-129.

Gocsik, K. (2002). Teaching critical thinking skills (Vol. 2, pp. 1-4): UTS newsletter.

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking.

Gorsky, P., Caspi, A., Blau, I., Vine, Y., & Billet, A. (2012). The impact of unit (sentence vs message) on the results of quantitative content analysis. *The International Review of Research in Open and Distance Learning, 13*(1).

Goyak, A. M. (2009). *The effects of cooperative learning techniques on perceived classroom environment and critical thinking skills of preservice teachers.* Doctoral Dissertation, Liberty University. Retrieved from http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1166&context=doctora1

Greenbaum, S., & Quirk, R. (1990). *A student's grammar of the English language.* Edinburgh Gate Harlow: Pearson Education Limited.

Groen, J., & Li, Q. (2005). Achieving the benefits of blended learning within a fully online learning environment: A focus on synchronous communication. *EDUCATIONAL TECHNOLOGY-SADDLE BROOK THEN ENGLEWOOD CLIFFS NJ-, 45*(6), 31.

Hadjistassou, S. (2008). Emerging feedback in two asynchronous ESL writing forums. *Handbook of research on computer-enhanced language acquisition and learning*, 342-360.

Halliday, M. A. K., & Hasan, R. (1976). Cohesion in English. London: Longman.

Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist, 53*(4), 449.

Halpern, D. F. (1999). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *New directions for teaching and learning, 1999*(80), 69-74.

Hedges, L. E. (1991). Helping students develop thinking skills through the problem-solving approach to teaching. *The Ohio State University, Dr. Lowell Hedges*.

Henri, F. (1992). Computer conferencing and content analysis *Collaborative learning through computer conferencing* (pp. 117-136): Springer.

Hillocks Jr, G. (2010). Teaching argument for critical thinking and writing: An introduction. *English Journal, 99*(6), 24-32.

Hinkel, E. (2001). Matters of Cohesion in L2 Academic Texts. *Applied Language Learning, 12*(2), 111-132.

Hung, D., Tan, S. C., & Koh, T. S. (2006). Engaged learning: Making learning an authentic experience. In D.Hung. & M. S. Khine (Eds.), Engaged learning with emerging technologies (pp. 29-48). Netherlands: Springer Netherlands. doi: 10.1007/1-4020-3669-8_2

Hussain, R. M. R. (2004). E-learning in higher education institutions in Malaysia. *E-mento, 5*(7).

Hyland, K.(2009). Writing in the disciplines: Research evidence for specificity. *Taiwan International ESP Journal*,1(1), 5-22.

Idrus, H., Dahan, H. M., & Abdullah, N. (2009). Challenges in the integration of soft skills in teaching technical courses: Lecturers' perspectives. *Asian Journal of University Education 5*(2), 67-81.

Irfan, N. U., & Noor Hazita, A. (2010). Trainee teachers' critical thinking in an online discussion forum. *MJLI, 7*, 75-91.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of mixed methods research, 1*(2), 112-133.

Jones, S. (1995). *Cybersociety: Computer-mediated communication and community*: Sage Publications Thousand Oaks, CA.

Jun, X. (2011). The application of critical thinking in teaching English reading. *Theory and practice in language studies, 1*(2), 136-141. doi: 10.4304/tpls1.2.136-141

Kamali, Z., & Fahim, M. (2011). The relationship between critical thinking ability of Iranian EFL learners and their resilience level facing unfamiliar vocabulary items in reading. *Journal of Language Teaching and Research, 2*(1).

Kanuka, H., & Anderson, T. (1998). Online interchange, discord, and knowledge construction. *Journal of Distance Education, 13*, 57-74.

Kaur, R., & Sidhu, G. (2010). Learner autonomy via asynchronous online interactions: a Malaysian perspective. *International Journal of Education and Development using ICT, 6*(3), 88-100.

Kim, I., & Kuljis, J. (2010). *Applying content analysis to web based content.* Paper presented at the Information Technology Interfaces (ITI), 2010 32nd International Conference on.

Kol, S., & Schcolnik, M. (2008). Asynchronous forums in EAP: Assessment issues *Language Learning & Technology, 12*(2), 49-70.

Koo, Y. L., Wong, F. F., Kemboja, I., Chang, P. K., & Mohd Subakir, M. Y. (2011). Literasi kritikal dalam konteks pendidikan tinggi: Suara dari sebuah bilik darjah di Malaysia. *GEMA Online™ Journal of Language Studies, 11*(2), 21.

Lai, E. R. (2011). Critical thinking: A literature review. *Pearson's Research Reports, 6*.

Lapadat, J. C. (2002). Written interaction: A key component in online learning. *Journal of Computer- Mediated Communication, 7*(4), 0-0.

Leston-Bandeira, C. (2009). Using e-learning to promote critical thinking in politics. *Enhancing Learning in the Social Sciences, 1*(3).

Li, K. M. (2010). Integrating weblogs in a pedagogy model for enhancing students' critical thinking skills. *Research and Practice in Teachnology Enhanced Learning, 5*(1), 35-49.

Li, Q. (2004). Knowledge building community: Keys for using online forums. *TechTrends, 48*(4), 24-29.

Lim, S. C., Cheung, R. W. S., & Hew, K. F. (2011). Critical thinking in asynchronous online discussion: An investigation of student facilitation techniques. *New Horizons in Education, 59*(1).

Lin, S. Y., & Chiu, C. K. (2008). Incentive styles, asynchronous online discussion, and vocational training. *Journal of Educational Computing Research, 39*(4), 363-377.

Lombard, M., Snyder-Duch, J., & Bracken, C. C. (2010). Practical resources for assessing and reporting intercoder reliability in content analysis research projects Retrieved 14/4/2013, 2013, from http://matthewlombard.com/reliability/index_print.html

Lopes, A. C. M. (2009). Justification: A coherence relation. *Pragmatics, 19*(2), 241-252.

Luppicini, R. (2007). Review of computer mediated communication research for education. *Instructional science, 35*(2), 141-185.

MacKnight, C. B. (2000). Teaching critical thinking through online discussions. *Educause Quarterly, 23*(4), 38-41.

Maddrell, J. A., Morrison, G. R., & Watson, G. S. (2011). Community of Inquiry Framework and Learner Achievement.

Maesin, A., Mansor, M., Shafie, L. A., & Nayan, S. (2009). A Study of Collaborative Learning among Malaysian Undergraduates. *Asian Social Science, 5*(7), P70.

Marra, R. M., Moore, J. L., & Kilmczak, A. K. (2004). Content analysis of online discussion forums: A comparative analysis of protocols. *Educational Technology Research and Development, 52*, 23-40.

McKinley, J. (2010). Critical thinking in FLA English composition. *Sophia International Review, 32*, 27-32.

Merskill, C., & Anthony, N. (2007). Form-focused communicative practice via CMC: What language learners say. *Calico Journal, 25*(1), 69-90.

Minter, M. K. (2010). Critical thinking concept reconstructed. *Contemporary Issues in Education Research (CIER), 3*(8), 33-42.

Mok, J. (2009). From Policies to Realities Developing Students' Critical Thinking in Hong Kong Secondary School English Writing Classes. *RELC journal, 40*(3), 262-279.

Murphy, E. (2004). An instrument to support thinking critically about critical thinking in online asynchronous discussions. *Australasian Journal of Educational Technology, 20*(3), 295-315.

Murray, D. E. (2000). Protean1 Communication: The Language of Computer-Mediated Communication. *Tesol Quarterly, 34*(3), 397-421.

Nandi, D., Hamilton, M., Chang.S., & Balbo, S. (2012). Evaluating quality in online asynchronous interaction between students and discussion facilitators. *Australasian Journal of Educational Technology, 28*(4), 684-702.

Nandy, B. R., & Sarvela, P. (1997). Content analysis reexamined: A relevant research method for health education. *American Journal of Health Behavior, 21*(3), 222-234.

Neuendorf, K. A. (2002). *The content analysis guidebook*: Saga Publications.

Newman, D. R., Webb, B., & Cochrane, C. (1995). A content analysis method to measure critical thinking in face-to-face and computer supported group learning. *Interpersonal Computing and Technology, 3*(2), 56-77.

Ng, A. L. (2008). Using discusion forums for ESL communication skills. *The Internet TESL Journal, 14*(10).

Nguyen, L. V. (2008). Computer mediated communication and foreign language education: Pedagogical features. *International Journal of Instructional Technology and Distance Learning, 5*(12), 23-44.

Nor, N. F. M., Razak, N. A., & Aziz, J. (2010). E-learning: Analysis of online discussion forums in promoting knowledge construction through collaborative learning. *WSEAS Transactions on Communications, 9*(1), 53-62.

Panitz, T. (1999). Benefits of cooperative learning in relation to student motivation. *Motivationfrom within: Approaches for encouraging faculty and students to excel, New directions for teaching and learning. San Francisco, CA*.

Panitz, T., & Panitz, P. (1998). Encouraging the use of collaborative learning in higher education. *Issues Facing International Education*, 273-292.

Paul, R., & Elder, L. (2006). *Thinker's guide to the art of socratic questioning*: The Foudation for Critical Thinking.

Perez, L. C. (2003). Foreign language productivity in synchronous versus asynchronous computer-mediated communication. *Calico Journal, 21*(1), 89-104.

Petress, K. (2004). Critical thinking: An extended definition. *EDUCATION-INDIANAPOLIS THEN CHULA VISTA-, 124*(3), 461-466.

PostGraduan. (2009). Critical thinking for greater process. Retrieved from http://issuu.com/penerbitwawasan/docs/meb_march_2012

Prasad, D. V. (2009). Empirical study of teaching presence and critical thinking in asynchronous discussion forums. *International Journal of Instructional Technology and Distance Learning, 6*(11), 3-26.

Priest, H., Roberts, P., & Woods, L. (2001). An overview of three different approaches to the interpretation of qualitative data. Part 1: Theoretical issues. *Nurse researcher, 10*(1), 30-42.

Prommas, P., & Sinwongsuwat, K. (2011). *A comparative study of discourse connectors used in argumentative compositions produced by Thai EFL learners and English native speakers*. Paper presented at the The 3rd International Conference of Humanities and Social Sciences. http://fs.libarts.psu.ac.th/research/conference/Proceedings3/article/1pdf/005.pdf

Rasti, I. (2011). *Involving the reader in the text: engagement markers in native and non-native student argumentative essays.* University of Liverpool.

Rex, L. A., Thomas, E. E., & Engel, S. (2010). Applying Toulmin: Teaching logical reasoning and argumentative writing. *English Journal, 99*(6), 56-61.

Richmond, J. E. (2007). Bringing critical thinking to the education of developing country professionals. *International Education Journal, 8*(1), 1-29.

Ricketts, J. C., & Rudd, R. (2004). Critical thinking skills of FFA leaders. *Journal of Sounthern Agricutural Educatin Research, 54*(1).

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2000). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education*.

Schneider,J.A. (n.d).Ethics, confidentiality and informed consent. Summary for student researchers. Retrieved from http://rbhs.rutgers.edu/hsp/education/educ_BonusHandouts4_EthicsConfidentialityInformedConsent.pdf

Shirkhani, S., & Fahim, M. (2011). Enhancing critical thinking in foreign language learners. *Procedia-Social and Behavioral Sciences, 29*, 111-115.

Simosi, M. (2003). Using Toulmin's framework for the analysis of everyday argumentation:Some methodological considerations. *Argumentation, 17*(2), 185-202.

Smith, H. (2008). Assessing student contributions to online discussion boards. *Practitioner Research in Higher Education, 2*(1), 22-28.

Song, H. S. Y., & Chan, Y. M. (2009). Exploring online spaces to support multi-ethnic Asian undergraduates' critical thinking.

Sotillo, S. M. (2000). Discourse functions and syntactic complexity in synchronous and asynchronous communication. *Language Learning & Technology, 4*(1), 82-119.

Stahl, N. N., & Stahl, R. J. (1991). We can agree after all! Achieving consensus for a critical thinking component of a gifted program using the Delphi technique 1. *Roeper Review, 14*(2), 79-88.

Swan. (2005). Threaded discussion. 11. Retrieved from http://www.mdecgateway.org/olms/data/resource/6355/Threaded%20Discussion.pdf

Taboada, M. (2000). Cohesion as a measure in generic analysis. *Círculo de Lingüística Aplicada a la Comunicación*(3), 6.

Tangpoon-Patanasorn, A. (2010). The use of linking adverbials in the argumentative essays of Thai EFL learners. *KKU Res J, 15*(78), 751-767.

Tayebinik, M., & Puteh, M. (2012). Txt msg n English Language Literacy. *Procedia-Social and Behavioral Sciences, 66*, 97-105.

Viera, A. J., & Garret, J. M. (2005). Understanding interobserver agreement: the kappa statistic. *Fam Med, 37*(5), 360-363.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge: Harvard University Press.

Walker, G. (2005). Critical thinking in asynchronous discussions. *International Journal of Instructional Technology & Distance Learning, 2*(6).

Wang, Q. Y., & Woo, H. L. (2008). The Affordances of Weblogs and Discussion Forums for Learning: A Comparative Analysis. *Educational Technology, 48*(5), 34-38.

Wang, Q. Y., & Woo, H. L. (2009). Using weblog to promote critical thinking-An exploratory study. *International Journal of Human and Social Sciences*, 872-880. doi: 10.1007/s12564-010-9101-5

Wangensteen, S. (2010). *Newly graduated nurses' perception of competence, critical thinkiing and research utilization.* Karlstad University, Karlstad.

Willingham, D. T. (2007). Critical thinking. *American Educator*.

Wohlfarth, D., Sheras, D., Bennett, J. L., Simon, B., Pimentel, J. H., & Gable, L. E. (2008). Student perceptions of learner- centered teaching. *A Journal of Scholarly Teaching, 3*, 67-74.

Xi, Y. (2010). Cohesion Studies in the Past 30 Years: Development, Application and Chaos. *The International Journal-Language Society and Culture*(31), 139-147. doi: http://www.educ.utas.edu.au/users/tle/JOURNAL/issues/2010/31-17.pdf

Yang, Y. T. C., Newby, T. J., & Bill, R. L. (2005). Using Socratic questioning to promote critical thinking skills through asynchronous discussion forums in distance learning environments. *The American Journal of Distance Education, 19*(3), 163-181.

Yassin, S., Hasan, F. A., Amin, W., & Amiruddin, N. (2008). *Implementation of generic skills in the curriculum.* Paper presented at the EDU-COM 2008 International Conference, Edith Cowan University, Perth Western Australlia.

Ying, S. (2009). Remarks on contrastive discourse markers (CDMs) in writing by non-native English learners. *US-China Foreign Language, 7*(4), 40-46.

Yoon-Hee, N. (2011). Cohesive devices in CMC texts produced by American and Korean EFL writers. *Linguistic Research, 28*(3), 743-771.

Yumuk, A. (2002). Letting go of control to the learners: the role of the Internet in promoting a more autonomous view of learning in an academic translation course. *Educational Research, 44*(2), 141-156.

Zhang, D. S. (2003). Powering E-learning in the new millennium: An overview of E-learning and enabling technology. *Information Systems Frontiers, 5*(2), 201-212.

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. *Applications of social research methods to questions in information and library science*, 308-319.

APPENDIX A: EXAMPLES OF COHESIVE DEVICES

Appendix A presents the examples of sentences in which the cohesive devices identified by Halliday and Hasan (1976) were found. This Appendix A starts with the presentation of example of anaphoric reference, followed by cataphoric reference, personal reference, demonstrative reference, comparative reference, nominal substitution, verbal substitution, clausal substitution, nominal ellipsis, verbal ellipsis, clausal substitution and conjunction namely the additive, adversative, causal and temporal conjunction.

A (i) Example of anaphoric reference:
- Ali works as a fisherman. Every day, he heads for the sea to catch fish before the break of dawn.

'He' refers to Ali in the preceding sentence. 'He' is an anophoric reference because it refers to the element precedes it which is 'Ali' appears in the earlier sentence.

A (ii) Example of cataphoric reference:
- Every day before she goes to work, Mary always feeds her kittens.

'She' refers to Mary. 'She' is a cataphoric reference because it refers forwardly to Mary which appears in the later sentence.

A (iii) Examples of personal reference:
- Minny is a kitten. It likes to play with ball.

- Mary and her friends are going to visit old folks home during the weekend. They are going to distribute some grocery items to the elderly staying there.

  The reference items in both examples 3 &4 are made up of third personal pronouns, i.e. 'It' and 'They'. In example 3, 'it' refers to 'Minny'. 'Minny' is the element that precedes 'It'. In example 4, 'They' refers to 'Mary and her friends'. 'Mary and her friends' is the element that precedes 'They'.

A (iv) Examples of demonstrative reference:

- Please refer to that. This is because the book will provide you the information you need.

- There are several apples in the basket on the table. You can take the apples from there.

The example 5 above shows the use of demonstrative pronoun 'that'. 'that' refers cataphorically to 'the book' in the second sentence. The example 6 above shows the use of demonstrative pronoun 'there'. 'there' refers anaphorically to the 'in the basket on the table' in the preceding sentence.

A (v) Examples of comparative reference:

- These biscuits made by Mary yesterday taste similar to those made by Lucy last year. (General comparison)

- Andrew is taller than his older brother. (Particular comparison)

In example 7 above, the use of 'similar' shows the similarity of the biscuits made by two different persons, i.e. Mary and Lucy in terms of the biscuits' taste. In example 8 above, the use of comparative adjective 'taller' was to compare the height between Andrew and his older brother.

A (vi) Example of nominal substitution:

- I like to buy red colour dress. However, I do not like the red one you are showing me now.

In example 9 above, the word 'one' acts as the substitute for the noun 'dress' appears in the preceding sentence.

A (vii) Example of verbal substitution:

- Do they understand the concept of cohesion completely? Yes, they do.

In example 10 above, the word 'do' acts as the substitute for the verb 'understand' appears in the preceding sentence.

A (viii) Examples of clausal substitution:

11) The storm seems to be imminent. If so, the football match will have to be cancelled.

12) Are you going to eat the cheesecake? If not, I will put in back into the fridge first.

In example 11 above, the word 'so' acts as the substitute for the clause 'the storms seems to be imminent'. In example 12 above, the word 'not' acts as the substitute for the clause 'you are not going to eat the cheesecake'.

A (ix) Examples of nominal ellipsis:

13) There are many kittens wondering at the backyard of my house. I would like to adopt the two with brown colour stripes on their bodies.

14) Susan has bought several paintings recently. She hung some on the living room's walls yesterday.

In example 13 above, the use of the word 'two' acts as the head of elliptical nominal group. The noun that was omitted is the noun 'kittens' found in the preceding sentence. Therefore, the full form should be 'two kittens'. In example 14 above, the use of the word 'some' acts also as the head of the elliptical nominal group. The noun that was omitted here is the noun 'paintings' Thus, the full form should be 'some paintings'.

A (x) Examples of verbal ellipsis:

15) Have you finished your work? Yes, I have.   (Lexical ellipsis)

16) What were you doing just now? Reading.   (Operator ellipsis)

In example 15 above, the full form of the answer to the question should be 'Yes, I have finished' or 'Yes, I have finished my work.' The lexical verb 'finished' was omitted. In example 16 above, the full form of the answer to the question should be 'I was reading'. However, 'the operator 'was' was omitted.

A (xi) Examples of clausal ellipsis:

17) Would you like to go travel with me? Yes.

18) Who is sleeping in the room now? Peter.

In example 17 above, the full answer to the question should be 'Yes, I would like to go travel with you.' However, the part of the sentence after the word 'yes' was omitted. In example 18 above, the full answer to the question should be "Peter is sleeping in the room now'. Similar to example 5, the part of the sentence after the word 'Peter' was omitted.

APPENDIX B: TOPICS OF THREADED DISCUSSIONS

Appendix B presents the four topics of threaded discussion. The Appendix B starts with the presentation of the two topics of threaded discussion for Research Methodology Course, followed by the presentation of the two topics of threaded discussion for Second Language Acquisition course.

B (I) The Two Threaded Discussion Topics for Research Methodology Course:

RM 1: First Topic of Threaded Discussion for the Research Methodology Course

*'A literature review is a piece of **discursive prose**, not a list describing or summarizing one piece of literature after another…' (By Dena Taylor, University of Toronto)*

How far do you agree with the statement above?

RM 2: Second Topic of Threaded Discussion for the Research Methodology Course

Based on the situations given, what aspect(s) should interviewer take into consideration while conducting an interview? Why?

Situation A:

> *Interviewee: For me, AIDS is indeed an eerie word.*

> *Interviewer: Can you explain why you use the word 'eerie' to*

> *describe AIDS?*

> *Interviewee: I don't know how to explain…Emm…*

> *Interviewer: It claims life so you think it is eerie?*

> *Interviewee: Yes, yes. I guess you get my point.*

> *Interviewer: Ok. Let's get on to the next question.*

Situation B:

> *Interviewee: For me, AIDS is indeed an eerie word.*

> *Interviewer: Can you explain why you use the word 'eerie' to*

> *describe AIDS?*

> *Interviewee: I don't know how to explain…Emm…*

> *Interviewer: It claims life so you think it is eerie?*

> *Interviewee: It's not so much on the aspects that it may lead to*

> *death, to me it is an unknown situation because usually, those who*

> *are tested HIV positive are not sure when they will get the full*

> *blown symptoms.*

> *Interviewer: So you are saying it is the unknown element that is*

> *frightening?*

B (II) The Two Threaded Discussion Topics for Second Language Acquisition Course:

SLA 1: First Topic of Threaded Discussion for the Second Language Acquisition Course :

Krashen indicates that:

> *Learners with high motivation and self-confidence will have low anxiety, thus*
> *the low filter will let in plenty of input. Whilst those with low motivation and*
> *self-confidence will have high anxiety and filter out many input.*

- *Is this true?*

- *Is anxiety in L2 learning always considered a bad thing?*

SLA 2: Second Topic of Threaded Discussion for the Second Language Acquisition Course :

> *Although second-language acquisition research has traditionally treated second-language learning as an individual cognitive phenomenon of internalization of second-language knowledge, this sociocultural perspective encourages us to see learning a second language as increasing one's participation in a community that uses this particular linguistic means to mediate community activities. From this perspective, children who are learning English at school might be seen as participants in particular local communities where activities or practices create possibilities for the children to make use of the tool, English (as well as many other socially derived tools).*
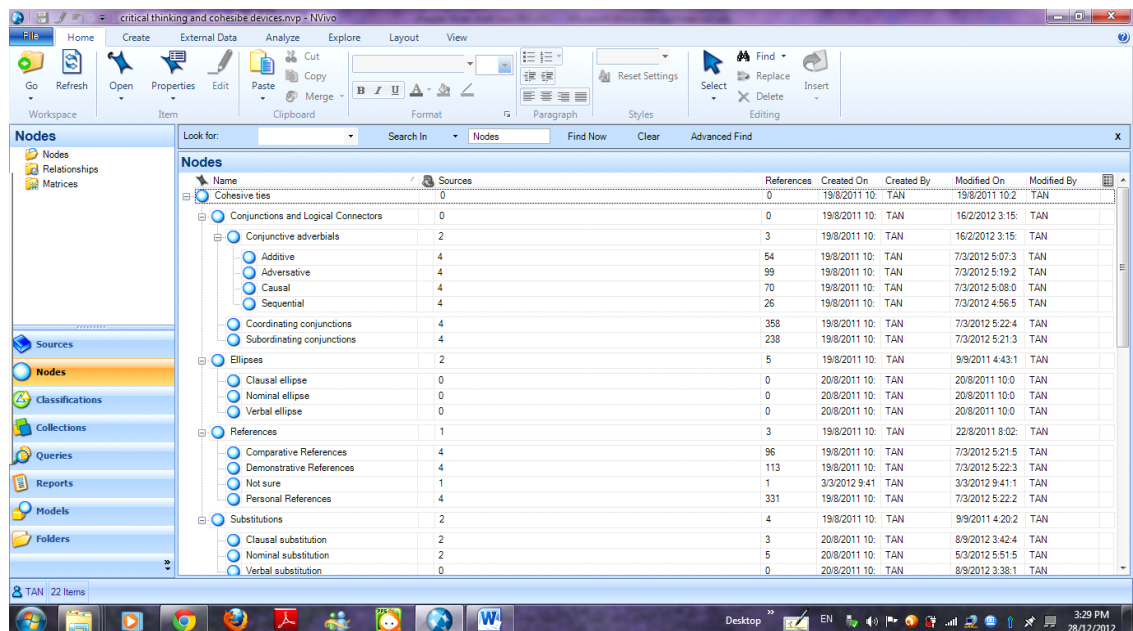
To what extent do you agree with the premise stated above? Please clarify your reason(s).

APPENDIX C: THE USE OF NVIVO 9 IN THE CONTEXT OF THIS STUDY

Appendix C presents the features of Nvivo 9 used to analyse the data of this study. The next section C(I) outlines the creation of parental and child nodes using Nvivo 9.

C (I) Creation of parental and child nodes

Referring to the figure C(1) below, at the node "Coordinating conjunction", the instances which contain the use of coordinating conjunction were all coded and later can all be traced back at the node "Coordinating conjunction" by clicking at the node itself.

Figure C (1): Halliday and Hasan Grammatical Cohesion Framework (1976) screenshot of Nvivo 9 workplace

There are two types of node. One is known as parental node and the other is called child node. Normally, parental node carries with it a general concept while child node displays a more specific concept. Child node can be the sub category branching out from parental node. For instance, referring to figure C (1) above again, here were four child nodes namely the additive, adversative, causal and temporal which were placed under the parental node "Conjunctive adverbials". Figure C(2) below, on the other hand,

showed the nodes created based on Newman et.al content analysis framework which functions as the coding scheme for the researcher to find out the critical thinking ratio for each asynchronous online forum transcripts.
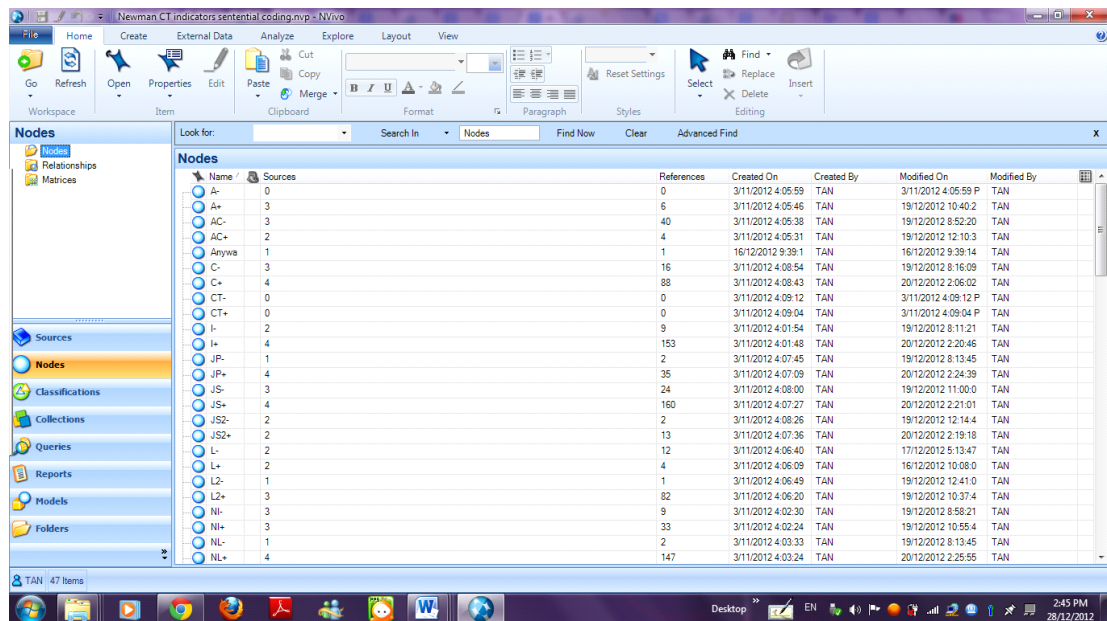

Figure C(2): Newman et.al content analysis framework (1995) screenshot of Nvivo 9 workplace. Next, the subsequent section will present the query functions employed by the researcher to analyse the data of this study.

C (II) The Query Feature of Nvivo 9

For data analysis part, the Query feature was employed as it allows the researcher to explore the pattern that emerged from the data. According to Nvivo 9 Help website, the function of queries is to aid the researchers to assemble and explore the subset in their data. There are several types of query functions under the New Query feature. They are known as Text Search Query. Coding Query, Compound Query, Word Frequency Query, Matrix Coding Query, Coding Comparison Query and Group Query. For this study, the researcher used Text Search Query, Word Frequency Query, Matrix Coding Query and Coding Comparison Query.

According to Nvivo 9 online manual, in general Text Search Query enables the user to search words or phrases from the source. One of the specific functions of Text Search Query is it enables the user to explore the meaning, context and the use of words. Wordtree is one of the features available under Text Search Query shown below in figure C(3).
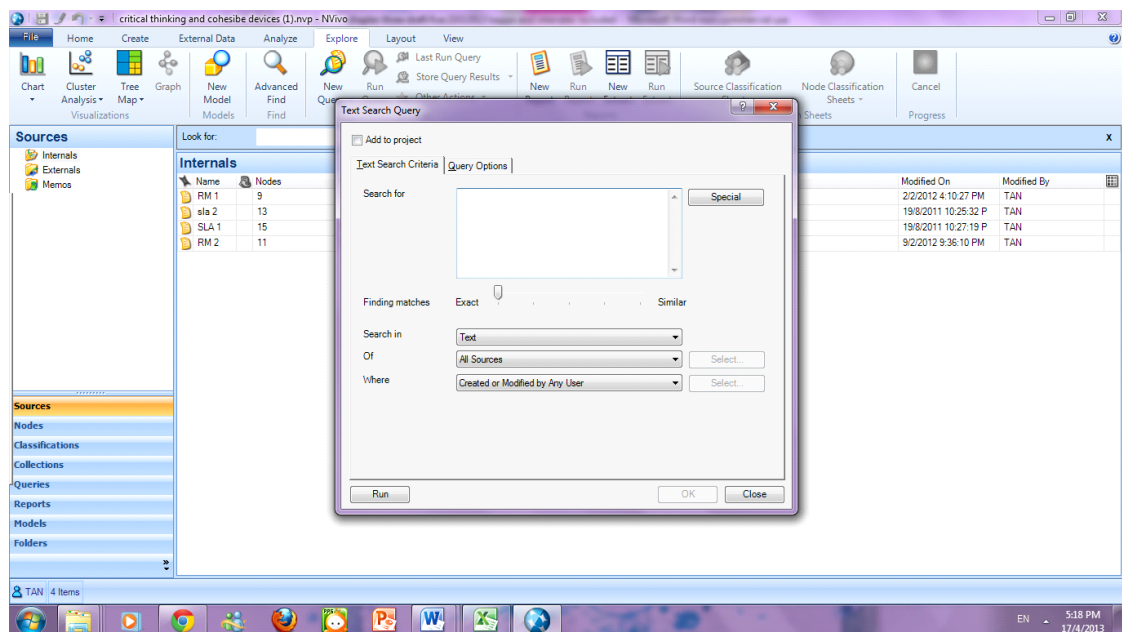

Figure C(3) : Screenshot of Text Search Query

It can be used to display the concordance lines of the words. Wordtree function was adopted for this study to enable the researcher to study the context, meaning and the use of the two most frequently used connectors for each category of conjunction found from the data collected. For instance, figure C(4) below showed the concordance lines of the causal conjunctive adverbial "therefore" using Wordtree.
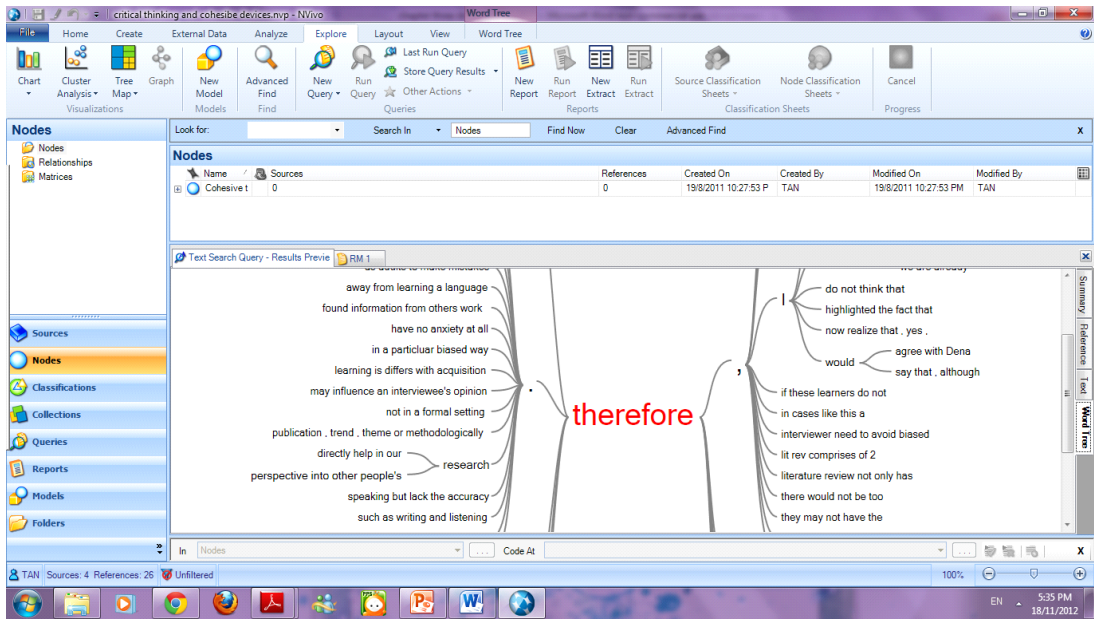
Figure C (4) : The concordance line of the conjunction "therefore"

Word Frequency Query functions in listing the most frequently occurring words in the source. For this study, Word Frequency Query was used to find out the 2 most frequently used connectors for each category of conjunction found in the data collected. The screenshot of Word Frequency Query was shown in Figure C (5) below.
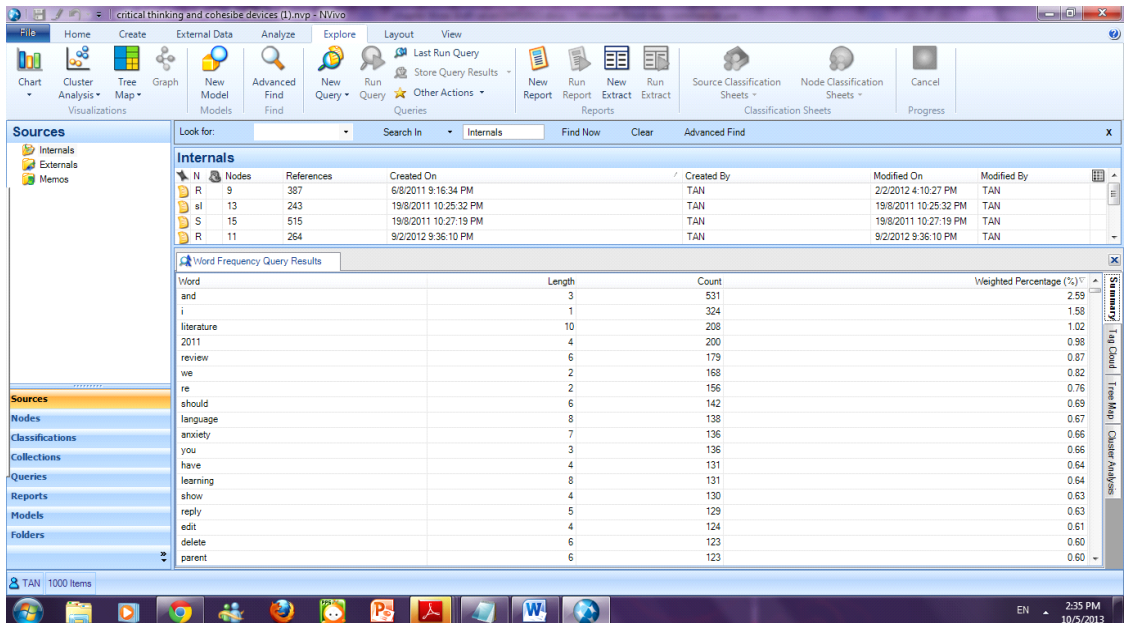

Figure C (5): Screenshot of Word Frequency Query

Matrix Coding Query, on the other hand, enables users to compare items and display the results in a table or matrix. One of the features of Matrix Coding Query is called Matrix Cell Content. One of the functions of Matrix Cell Content is it allows user to select whether to display the result in table using row percentage or column percentage. Figure C (6) below shows the screenshot of Matric Coding Query row percentage result.
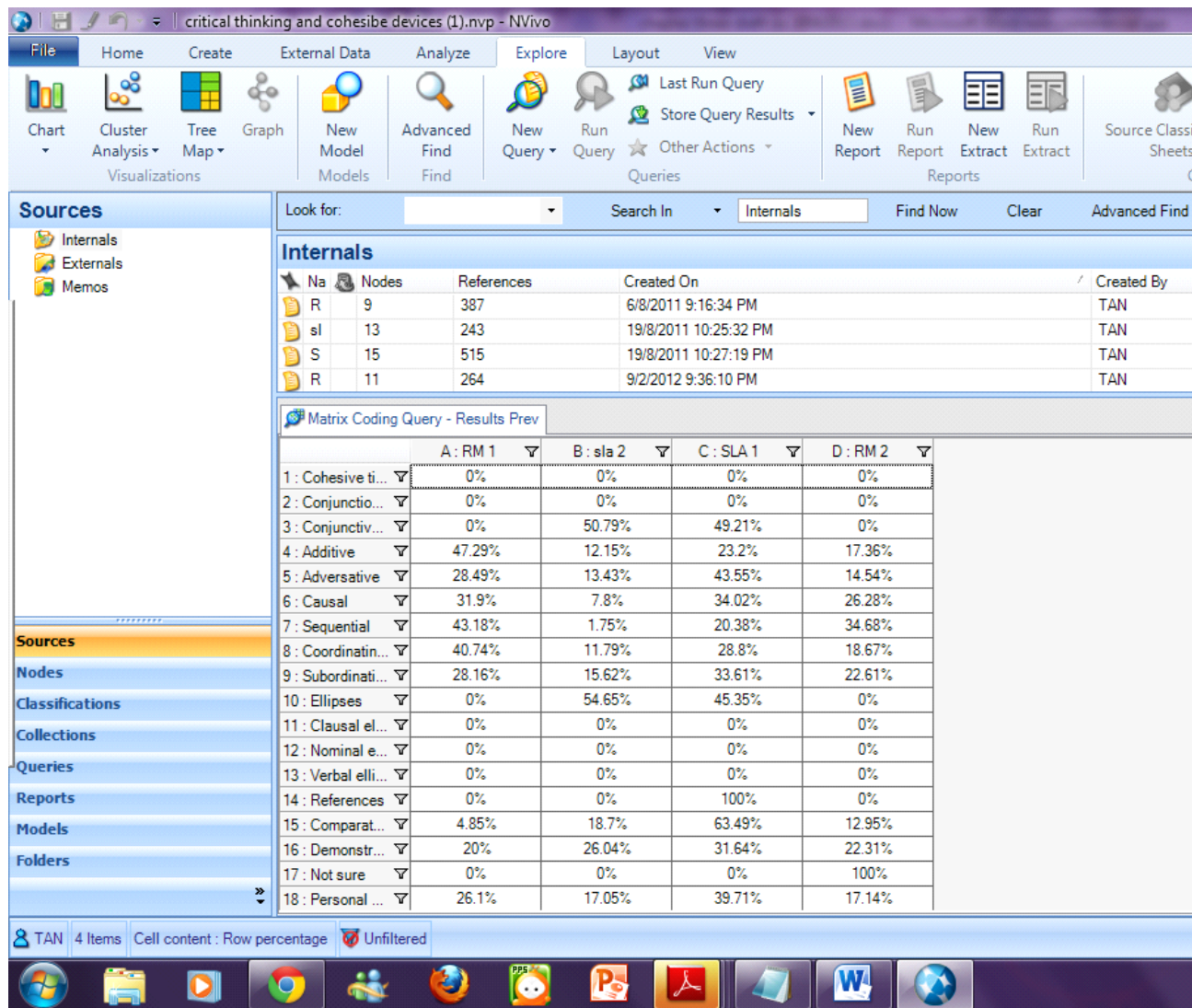
Figure C (6): Screenshot of Matrix Coding Query which shows Row Percentage

Coding comparison query helps the researchers to obtain the interrater reliability reading. Both the values of Kappa coefficient and percentage of agreement can be calculated using Coding Comparison query. For this study, coding comparison query

was used by the researcher to obtain both the Kappa coefficient and percentage of agreement values. Figure C (7) below shows the screenshot of coding comparison query.

Figure C (7): Screenshot of Coding Comparison Query

APPENDIX D: INTERRATER RELIABILITY READING

Appendix D presents the value for both the percentage of agreement and Kappa coefficient. Using the coding comparison query feature provided by Nvivo 9, it was found that the value for the percentage of agreement is 94.66 % and the value for Kappa coefficient is 0.72 (Refer to Table D (1) below).
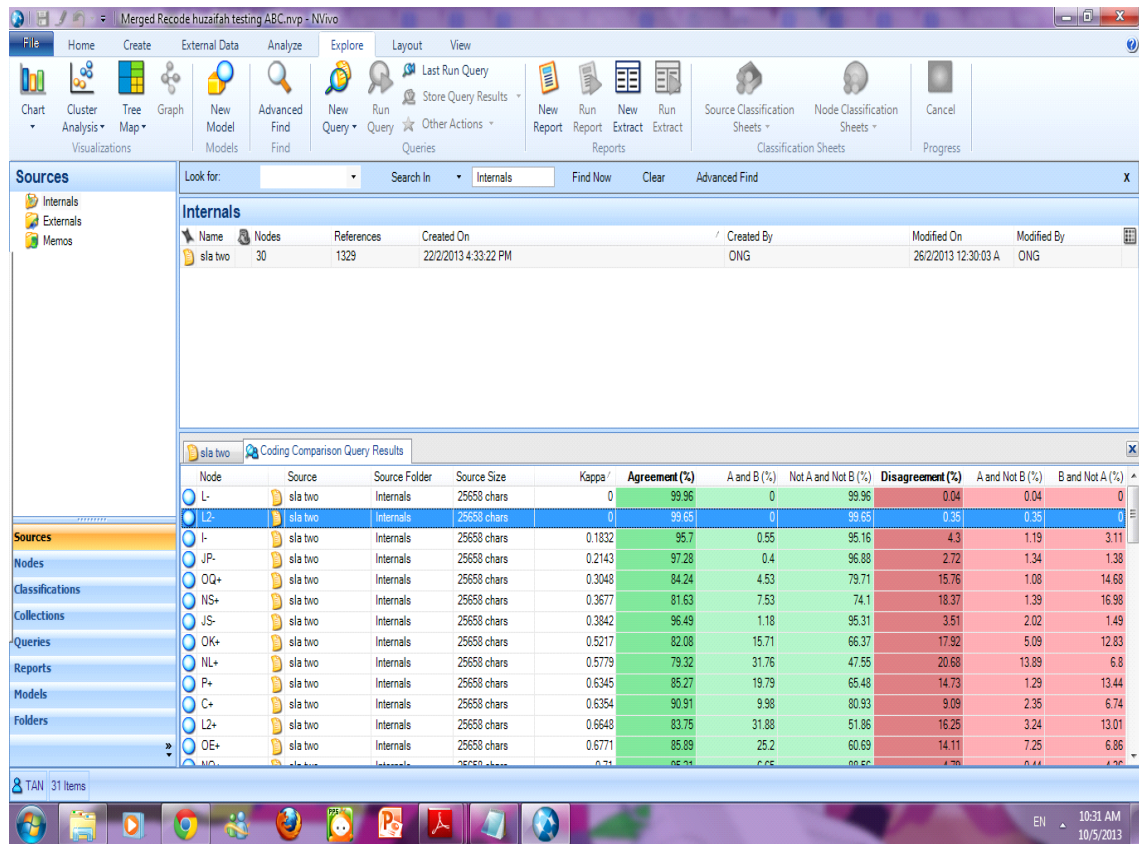
Nod	Node	Sou	Source	Source Folder	Source Size	Kappa	Agreement (%)	A and B (%)	Not A and Not B (%)	Disagreement (%)	A and Not B (%)	B and Not A (%)
	L-		sla two	Internals	25658 chars	0	99.96	0	99.96	0.04	0	0.04
	L2-		sla two	Internals	25658 chars	0	99.65	0	99.65	0.35	0	0.35
	I-		sla two	Internals	25658 chars	0.1832	95.7	0.55	95.16	4.3	3.11	1.19
	JP-		sla two	Internals	25658 chars	0.2143	97.28	0.4	96.88	2.72	1.38	1.34
	OQ+		sla two	Internals	25658 chars	0.3048	84.24	4.53	79.71	15.76	14.68	1.08
	JS-		sla two	Internals	25658 chars	0.3842	96.49	1.18	95.31	3.51	1.49	2.02
	NS+		sla two	Internals	25658 chars	0.4693	83.81	10.5	73.31	16.19	11.58	4.61
	OK+		sla two	Internals	25658 chars	0.5217	82.08	15.71	66.37	17.92	12.83	5.09
	NL+		sla two	Internals	25658 chars	0.5779	79.32	31.76	47.55	20.68	6.8	13.89
	C+		sla two	Internals	25658 chars	0.6354	90.91	9.98	80.93	9.09	6.74	2.35
	L2+		sla two	Internals	25658 chars	0.6648	83.75	31.88	51.86	16.25	13.01	3.24
	OE+		sla two	Internals	25658 chars	0.6771	85.89	25.2	60.69	14.11	6.86	7.25
	P+		sla two	Internals	25658 chars	0.6964	88.3	19.79	68.5	11.7	10.41	1.29
	NQ+		sla two	Internals	25658 chars	0.71	95.21	6.65	88.56	4.79	4.36	0.44
	NP+		sla two	Internals	25658 chars	0.7658	90.68	22.41	68.27	9.32	8.61	0.71
	W+		sla two	Internals	25658 chars	0.8005	92.42	21.45	70.97	7.58	7.58	0
	NI+		sla two	Internals	25658 chars	0.813	92.97	21.55	71.42	7.03	4.73	2.3
	I+		sla two	Internals	25658 chars	0.9347	97.85	19.71	78.14	2.15	2.15	0
	JS+		sla two	Internals	25658 chars	0.9537	98.31	23.09	75.22	1.69	1.69	0
	JP+		sla two	Internals	25658 chars	0.9805	99.6	11.34	88.26	0.4	0.4	0
	A-		sla two	Internals	25658 chars	1	100	6.22	93.78	0	0	0
	A+		sla two	Internals	25658 chars	1	100	0	100	0	0	0
	C-		sla two	Internals	25658 chars	1	100	0.39	99.61	0	0	0
	JS2+		sla two	Internals	25658 chars	1	100	1.7	98.3	0	0	0
	NI-		sla two	Internals	25658 chars	1	100	1.74	98.26	0	0	0
	OC+		sla two	Internals	25658 chars	1	100	1.77	98.23	0	0	0
	ON+		sla two	Internals	25658 chars	1	100	1.32	98.68	0	0	0
	P-		sla two	Internals	25658 chars	1	100	1.74	98.26	0	0	0
	R-		sla two	Internals	25658 chars	1	100	1.54	98.46	0	0	0
	R+		sla two	Internals	25658 chars	1	100	66.31	33.69	0	0	0
	W-		sla two	Internals	25658 chars	1	100	1.43	98.57	0	0	0
						0.7189	94.6587					

Table D (1): Values of Percentage of Agreement and Kappa Coefficient

APPENDIX E: CODING EXAMPLES

Example E(1): Extracted from the Topic 2 of Threaded Discussion Research Methodology Course by XXX - Monday, 7 March 2011, 10:34 AM

I think the most important point to note before analyzing both the situation is: What's the Research Question that the interviewer is aiming to answer? (R+) (Relevant statement),(AC+) (Clear, unambiguous statement),(I+) (Important statement),(OC+) (Refer to course material). By having the RQ in view, the interviewer is able to shape and be flexible in the questions that are asked. (JS+)(Justified statement), (R+)(Relevant statement), (AC+)(Clear, unambiguous statement), (I+)(Important statement). Different interviewee with different style of communication and temperament may require different way to probing for an answer.(JS+)(Justified statements) (R+) (Relevant statement),(AC+), (Clear, unambiguous statement), (I+) (Important statement),(NL+)(Learner brings in new things),(W+)(Widen discussion).

Anyway, coming back to the discussion topic, in situation A, possibly the statement about one's perception regarding AIDS was not the main thing that the interviewer was looking for, therefore he/she did not dwell too long in that statement and moved on to another more pressing question (more so when the interviewee is not very articulate in his/her points). (JS+)(Justifying solutions or judgments) (R+)(Relevant statement), (I+)(Important statement), AC+(Clear, unambiguous statement). One thing to note too is that sometimes there's time constraint during the interview. Hence prioritization of questions is important. (NL+)(Learner brings new things in), (OC+)(Refer to course material), (R+)(Relevant statement),(AC+)(Clear, unambiguous statement),(I+)(Important statement), (W+)(Widen discussion).

In Situation B, I think the interviewer did a good job in rephrasing the interviewee's statement. (R+)(Relevant statement), (I+) (Important statement),(AC+)(Clear, unambiguous statement,)(W+)(Widen discussion), (C+) (Critical assessment of others' and own contribution). This allows the interviewee a chance to agree with his/her previous statement and the interviewer to truly understand what is articulated (JS+)(Justifying solution or judgments),(R+)(Relevant statement),(I+) (Important statement) (AC+)(clear, unambiguous statement). One point to note during interview is never assumed we understand what the other person is saying. (JS+)(Justifying solutions or judgments),(R+)(Relevant statement)(I+)(Important statement)(AC+)(Clear, unambiguous statement),(NL+)(Learner brings in new things), (OC+) (Refer to course material).It's always good to rephrase the statement and ask for confirmation.(JS+)(Justifying solutions or judgments),(R+)(Relevant statement),(AC+)(Clear, unambiguous statement),(I+)(Important statement).

Example E(2): Extracted from the Topic 1 of Threaded Discussion Second Language Acquisition Course by XXXX

I am interested in your new 'formula' in which you stated that;

$\uparrow$motivation — $\uparrow$anxiety = $\downarrow$input <OQ+>, <NQ+>, <C+>

Although it might sound slightly illogical, but i did experience this situation previously. <JP+> (Providing proof or examples), <R+> (Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion), <NL+>(Learner brings new things in), <L+>(Generating new data from information collected) I used to enjoy my foreign language classes, until the new teacher came. <JP+> (Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen

discussion) , <NL+>(Learner brings new things in),<L+> (Generating new data from information collected). She was strict most of the times and expected us to be so fluent, so much so that all of us were extremely anxious during learning that we became so motivated to learn in order to avoid being morally put down. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion), <NL+>,(Learner brings new things in), <L+>(Generating new data from information collected).We started to become competitive instead of cooperative. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion) , <NL+>(Learner brings new things in),<L+>(Generating new data from information collected). But at the end of the semester, all of us did so poor in our tasks, both written and oral. <JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion),<NL+>(Learner brings new things in) , <L+>(Generating new data from information collected) Partly because we refrained ourselves from asking questions during lessons due to our anxiety.<JP+>(Providing proof or examples), <R+>(Relevant statement), <OE+>(Drawing on personal experience), <W+>(Widen discussion) ,<NL+>(Learner brings new things in), <L+> (Generating new data from information collected).