

**CRITICAL THINKING AND LEXICAL COHESION OF
ESL LEARNERS' ACADEMIC WRITING**

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2018

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**DISSERTATION SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF ENGLISH AS A SECOND
LANGUAGE**

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2018

Abstract

This study investigated students' use of lexical cohesion in writing and how it reflects the critical thinking. The study aims to: 1) determine the frequency of each type of lexical cohesion, i.e reiteration and collocation used by participants in writing, 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 lexical cohesion 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 study were Sixth Formers of a National type secondary school located in Klang Valley. A mixed method data analysis method was adopted for this study. Data was collected from the participants via a writing task given during their English lesson in school. Overall, 18 written samples were collected and used as the source of data of this study. Halliday and Hasan 1976) Taxonomy of Lexical 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 pattern of relationship between the use of lexical and critical thinking performance, a qualitative data analysis approach was used to study the written samples of proficient and less proficient students where the use of reiteration and collocation appeared and how the use of them might reflect the critical thinking performance of the proficient and less proficient students.

Based on the Halliday and Hasan (1976) Taxonomy of Lexical Cohesion, it was found that reiteration was the most frequently used lexical cohesion device by less proficient students and collocation was the most frequently used lexical cohesion device by proficient students. In addition, after coding the data using The Newman et. al 1995) content analysis scheme, it was

found that the proficient students who used significantly more collocations reflected their critical thinking ability in terms of being able to include relevant (R+ positive critical thinking indicator), clear (AC+ positive critical thinking indicators, novel (N+ positive critical thinking indicator) and justified (JS+ positive critical thinking indicator} input into their writing. On the other hand, less proficient students who used significantly more reiteration as in repetitions, reflected their critical thinking ability in terms of being able to include only irrelevant (R- negative critical thinking indicator), confused statements (AC- negative critical thinking indicators, false or trivial leads (N- negative critical thinking indicator) input into their writing. The ultimate purpose of this study is by understanding the pattern of relationship is between lexical cohesion and critical thinking is writing can enhance teaching syllabus, materials and evaluation methods for the teaching of critical thinking in academic writing.

ABSTRAK

Kajian ini menerokai bagaimana penggunaan kohesi lexical Inggeris dapat mencerminkan pemikiran kritis dalam penulisan pelajar-pelajar Tingkatan Enam.. Matlamat kajian ini adalah untuk 1) menentukan kekerapan penggunaan kohesif lexical iaitu reiterasi dan kolokasi oleh peserta kajian dalam dalam penulisan akademik mereka, 2) menentukan kebolehan pemikiran kritis peserta dengan menggunakan cara Analisa data yang dicipta oleh Newman et.al pada tahun 1995, dan 3) untuk menyelidiki hubungan, jika ada, antara penggunaan kohesif lexical iaitu reiterasi dan kolokasi dalam mencerminkan prestasi pemikiran kritis para peserta kajian ini. Kekurangan kajian yang terperinci 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 Tingkatan Enam di sebuah sekolah jenis kebangsaan di Lembah Klang. Kaedah data analisis campuran telah digunakan untuk kajian ini. Data dikumpul daripada tugas penulisan akademik Bahasa Inggeris sewaktu pengajaran dan pembelajaran di kelas mereka. Secara keseluruhannya, lapan belas sampel penulisan akademik telah dikumpulkan dan digunakan sebagai data untuk kajian ini. Teori kohesi leksikal Halliday dan Hasan (1976) dan kaedah analisis Newman et.al (1995) telah digunakan untuk menganalisis data dan ini menghasilkan keputusan kuantitatif. Sebaliknya, kajian kualitatif telah digunakan untuk mengkaji perhubungan di antara leksikal cohesive dan pemikiran kritiis yang wujud dalam konteks data kajian ini yang akan mencerminkan tahap pemikiran kritis di kalangan pelajar mahir dan pelajar kurang mahir.

Berdasarkan Halliday dan Hasan (1976) teori kohesi lexical, didapati bahawa reiterasi paling kerap digunakan oleh pelajar yang kurang mahir dan kolokasi yang paling kerap digunakan oleh pelajar yang mahir dalam sampel penulisan. Di samping itu, selepas menggunakan kaedah analisis Newman et.al (1995) untuk menganalisa data, didapati bahawa sampel penulisan pelajar mahir yang menggunakan kolokasi secara tepat mencerminkan kemampuan berfikir secara kritis 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) di dalam sampel penulisan mereka. Disebaliknya, pelajar yang kurang mahir lebih kerap menggunakan reiterasi dari aspek pengulangan kata dan ini sebaliknya hanya mencerminkan menghubungkan idea-idea mereka secara tidak logic, misalnya menyumbang maklumat yang tidak berkaitan (R- penunjuk pemikiran kritikal negatif), kurang penjelasan (AC- penunjuk pemikiran kritikal negatif) , dan kurang wajar (JS- penunjuk pemikiran kritikal negatif) di dalam sampel penulisan mereka. Tujuan mengenal pasti ciri-ciri perhubungan antara pemikiran kritikal dan kohesi leksikal adalah untuk membina sukatan pengajaran, alat bantuan dan garis panduan yang lebih berkesan untuk menilai pemikiran kritikal dalam penulisan akademik para pelajar

ACKNOWLEDGEMENT

Writing up this dissertation has been a long journey along a long and winding road. Along the way, various people contributed one way or another to help me complete this very meaningful discovery. To these kind people, I would like to express my heartfelt thanks.

First and foremost, I would like to express my deepest gratitude to my advisor Dr. Ng Lee Luan for her continuous spiritual support, excellent guidance, unfailing encouragement and patience to see this writing to its completion. Without her untiring efforts, right from the first day, this whole journey would have not been completed. I could not have imagined having a better advisor and mentor for this academic journey of mine.

My sincere thanks also goes to my family, especially my husband, Franki Anthony, whose love and encouragement has been my everlasting strength to sustain in finishing this thesis; my children, Steffanie, Bennita and Aaron for their continuous support especially with IT related issues were concerned, not forgetting my son in laws, Joseph and Eugene, who have done their parts in one way or another; and last but not least to my dear friend Amerjit Kaur Khosa for being there when I needed her.

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LIST OF ABBREVIATIONS

LC	:	Lexical Cohesion
CT	:	Critical Thinking
MUET	:	Malaysian University English Test
CTS	:	Critical Thinking Skills

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Critical thinking has increasingly been seen as one of the important attributes when empowering human capital is concerned. For instance, as stated in the 10th Malaysian Plan, “the success of 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, as quoted by Koo, Wong, Kemboja, Chang and Mohd Subakir (2011) in their study, the Ministry of Higher Education in Malaysia 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 university graduates. This suggests 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.

In a global sense, to thrive in a rapidly evolving, technology-mediated world, students must not only possess strong skills in areas such as language arts, mathematics and science, but they must also be adept at skills such as critical thinking, problem-solving, persistence, collaboration and curiosity. All too often, however, students in many countries are not attaining these skills. In this context, the World Economic Forum has taken on a multi-year initiative, New Vision for Education, to examine the pressing issue of skills gaps and explore ways to address these gaps through technology. (Group, 2015)

In their report, they undertook a detailed analysis of the research literature to define what they considered to be the 16 most critical “21st-century skills”. Their study of nearly 100 countries reveals large gaps in selected indicators for many of these skills – between developed and developing countries, among countries in the same income group and within countries for different skill types. These gaps are clear signs that too many students are not getting the education they need to prosper in the 21st century and countries are not finding enough of the skilled workers they need to compete.

1.2 The statement of the problem

Although developing students’ critical thinking is of value to educators, there seems to be lack of emphasis on developing the necessary critical thinking skills. Choy (2010) states in his research, *Teacher Perceptions of Critical Thinking Among Students and its Influence on Higher Education*, that despite the emphasis on nurturing students are able to think critically, it is not yet fully incorporated into the education curriculum.

In many language learning classrooms, the priority is assigned to developing the four language skills, with little attention to basic premises of higher level thinking. Thus, learners might gain a good command of the language itself but are most probably, unable to think effectively using that language.

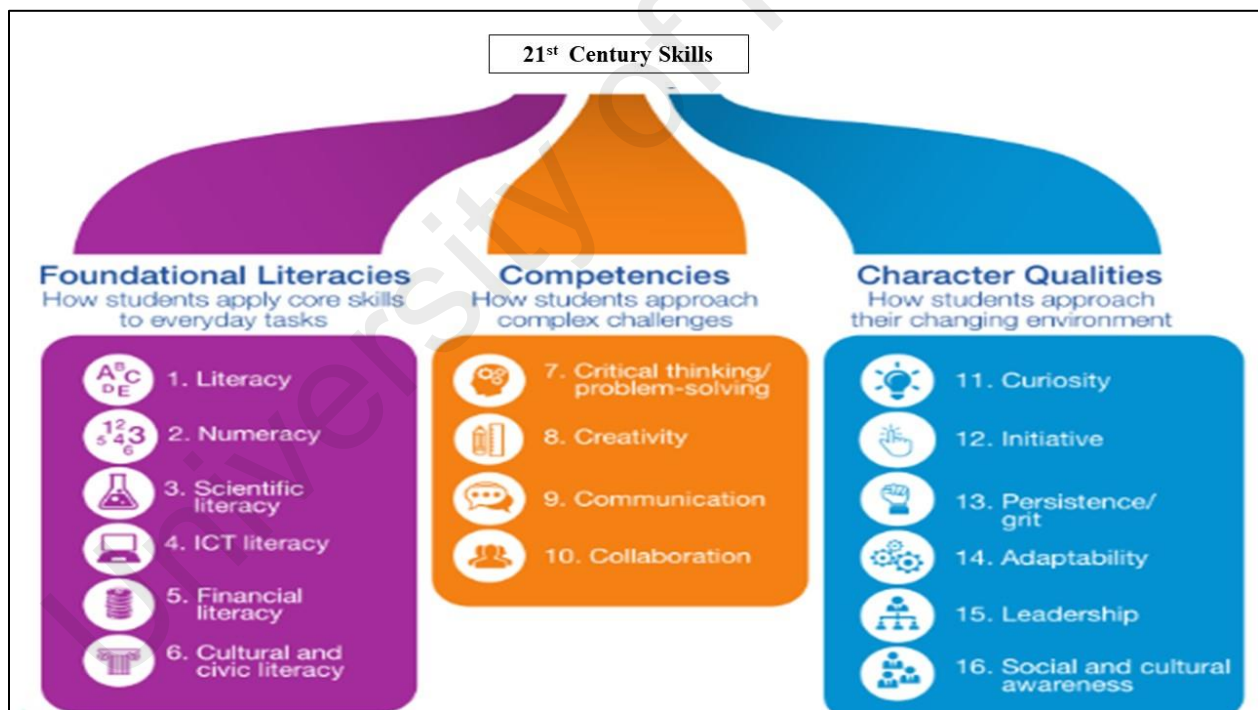
Zabit (2010) claims that traditional education has been criticised in the achievements to help students to develop habits of critical thinking that will be vital in order to succeed (Dewey,1994; Delisle, 1997; Lemke, 2001) and developing intelligence (Tan, 2007) in the ever-

changing 21st century. The following section will discuss in further detail about the skills needed in the 21st century.

1.2.1 The skills needed in the 21st century

To uncover the skills that meet the needs of a 21st-century marketplace, (Group, 2015) conducted a meta-analysis of research about 21st-century skills in primary and secondary education. They distilled the research into 16 skills in three broad categories: foundational literacies, competencies and character qualities (Skills, 2013). Figure 1 exhibits the 21st century skills.

Figure 1: 21st century skills required by students



With reference to Figure 1 above, foundational literacies represent how students apply core skills to everyday tasks such as skills of literacy, numeracy, and scientific literacy. The following category is ‘**Competencies**’ which in turn describe how students approach complex challenges.

This category of competencies has a sub skill which is related to this study namely critical thinking/problem-solving. For example, critical thinking is the ability to identify, analyse and evaluate situations, ideas and information in order to formulate responses to problems. Other sub skills in this category are creativity, communication and collaboration. Competencies such as these are essential to the 21st-century workforce, where being able to critically evaluate and convey knowledge, as well as work well with a team, has become the norm. The third category '**Character Qualities**' describes how students approach complex challenges alongside the demands of rapidly changing markets where character qualities such as persistence and adaptability ensure greater resilience and success in the face of obstacles. The shift in skill demand has exposed a problem in skill supply: more than a third of global companies reported difficulties filling open positions in 2014, owing to shortages of people with key skills.

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 that incorporate critical thinking. Thus, before this study looks into assessing the critical thinking performance of the participants who are Upper Sixth Formers in the context of writing, the next section will briefly explain the scenario of the Malaysian Education system with regards to critical thinking.

1.3 The Background of the Study

1.3.1 Critical thinking in the Malaysian Education

The idea of teaching critical thinking in our schools has been implemented in all the subjects since 1990, then known as 'KBKK', that is *Kemahiran Berfikir Kritis dan Kreatif* or Critical and Critical Thinking Skill (CCTS). In spite of implementing CCTS in the teaching and

learning of subjects in schools all over the country from 1990, the absence of critical thinking in our Malaysia's education system has been reflected by this country's ranking in the Programme for International Student Assessment (PISA) 2016. The weighted response rate among the initially sampled Malaysian schools (51 per cent) fell short of the standard PISA response rate of 85 per cent. Therefore, the results were not comparable to those of other countries or to results for Malaysia from previous years.

In other words, in the 2018 PISA, the scores fell short of full recognition and this poses to be only one of the many challenges Malaysia is facing in the education system with regards to critical thinking (Chong, 2016).

There are efforts made in addressing the thinking skills development in Malaysia. The education system in Malaysia has undergone a huge transformational progress particularly in the development of thinking skill as the education sector is one of the sectors which contribute to the development of the human capital.

The Malaysian Education Blueprint 2013 – 2025 indicates six attributes for student aspirations – knowledge, thinking skills, leadership, bilingual proficiency, ethics and National Unity. As for thinking skills component, it is stated that every child will master a range of important cognitive skills, including problem-solving, reasoning, creative thinking, and innovation. It also addresses that in the area of developing thinking skills the education system has historically fallen short, with students being less able than they should be in applying knowledge and thinking critically outside familiar academic contexts.

1.3.2 English Language in Malaysia

Based on (Asmah, 1981, pp. 230-231), English language has been spoken in Malaysia for decades, from pre-independence days until today. As it is widely spoken, the English Language is

considered the second language of the country and till today the English Language is used extensively in commercial and social settings, formal and informal situations – in business transactions, internet communication, advertisement and entertainment industry. In government administration, although Malay is the official language, English usage is frequent and necessary in many international transactions and correspondences. To a certain extent, English has become part and parcel of the life of Malaysians. As an example, failure in securing jobs after graduation is often linked to the inability to communicate effectively in English. It is also a common notion in Malaysia that one's success in today's competitive global world is associated with the mastery of the English language.

Due to its importance, English has been made a compulsory subject taught and tested as a second language for 11 years, from the first year of an individual's primary education to the end of his/her secondary education in Form Five. Unfortunately, prior to 1999, English was not taught or tested at the Sixth Form or pre-university level. However, upon entry into the local public tertiary institutions, these pre-1999 students were required to undergo a course in English language proficiency. This is because at the tertiary level, although the medium of instruction in the public universities is the national language (Malay), English is widely used to teach science and mathematics-related subjects or courses.

1.3.3 MUET

It was with the dual purpose of filling the gap with respect to the training and learning of English and that of consolidating and enhancing the language literacy of the Sixth Form and pre-university students, that the Malaysian University English Test (MUET) was first introduced in

1999, along with a curriculum/syllabus for delivery at Sixth Form and equivalent level. Thus, this study looks into assessing the critical thinking performance of the participants who are Upper Sixth Formers in the context of writing. In addition, in order to find out whether lexical cohesion in the students writing reflects the critical thinking skills of the participants. This study will also further investigate the use of reiteration and collocation by proficient and less proficient students in academic writing.

1.4 The Purpose of the Study

The overall purpose of this study is to examine how students' use of lexical cohesion: reiteration and collocation in writing reflect their critical thinking. There are three specific objectives of this study. Firstly, the research is aimed to determine the percentage of reiteration and collocation used by proficient and less proficient students' in their writing. Secondly, the research hopes to determine the critical ratio in proficient and less proficient students' writing by using the content analysis scheme established by Newman, Webb and Cochrane in 1995. Newman et. al. (1995) who 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, between critical thinking performance and lexical cohesion in proficient and less proficient students' academic writing. This study will employ the Halliday and Hasan (1976) Taxonomy of Lexical Cohesion to analyse the lexical cohesion devices: reiteration and collocation found in the writing samples. Fourthly, a semi structured interview will be carried out by teachers who are also examiners of the National writing exam for MUET to validate the findings of this study based on the three specific objectives of this study. In relation to the stated objectives, the following are the research questions.

1.5 Research Questions

Based on the objectives mentioned above, the study seeks to answer the following questions:

1. What is the percentage of reiteration and collocation found in proficient and less proficient students' writing?
2. What is the critical thinking ratio in proficient and less proficient students' writing?
3. What is the relationship between critical thinking performance and lexical cohesion in proficient and less proficient students' academic writing?
4. How do instructors view the relationship between lexical cohesion and critical thinking in academic writing?

The four research questions in this study aims to investigate how lexical cohesion and critical thinking features found in the writing of proficient writers differs from non-proficient writers because proficient writers write essay with quality (McNamara et al., 2013). Researchers stated that the quality of essays is strongly related to longer texts with explicit cohesion devices (Crossley, Roscoe, et al., 2011; Ferrari et al., 1998; Haswell, 2000; McNamara et al., 2010) and an increased amount of relevant information that aids the reader in understanding the topic or argument of the essay (i.e., more information equals better clarification). Furthermore, the elaboration on a topic or argument using explicit cohesion devices link the ideas in the text together (King & Rentel, 1979). However, in the local context, at the MUET level, the use of explicit cohesion cues to organize text (McCutchen, 1986; McCutchen & Perfetti, 1982) is lacking and is generally associated with less proficient writing. For instance, less proficient writers tend to use a greater repetition of words and less use of collocation than proficient writers (McNamara et al., 2010) and have greater word overlap between sentences (McNamara et al., 2013). Recent analyses

have demonstrated that there are linguistic styles that can be used to produce a high quality essay (Crossley, Roscoe, & McNamara, 2014) such as academic style (i.e., longer texts that are also more linguistically complex), and lexical styles (i.e., the use of more infrequent words and collocation). Researchers like NAEP (2011) claims that proficient writers coordinate a number of cognitive and knowledge skills related to critical thinking and possess linguistic abilities which is the use of explicit cohesive devices (Flower & Hayes, 1981; Kellogg & Whiteford, 2009). In short, linguistically, skilled proficient writers have stronger lexicon skills (Applebee, Langer, Jenkins, Mullis, & Foertsch, 1990; Ferrari et al., 1998; McNamara et al., 2010) that enable them to produce an essay with quality. The next section will discuss the significance of the study.

1.6 Significance of the Study

This study is important and beneficial for both learners' and language teachers since it highlights the use of lexical cohesion: reiteration and collocation and sheds light on the importance of using lexical cohesion in academic writing. The findings of the study can assist language teachers to improve their teaching strategy when it concerns writing and change any misconceptions regarding the use of reiteration and collocation in academic writing. Moreover, learners' awareness of the appropriate choice of vocabulary will help them improve their proficiency and lexical competence. Identifying the relationship between lexical cohesion and critical thinking further enhances ESL learners' writing quality. There is a lack of studies which explores the relationship between the use of lexical cohesion and critical thinking in writing.

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 framework which have been employed by the previous researchers who studied the use of cohesive devices in the writing samples were Halliday and Hasan Taxonomy of Cohesion (1976) and Celce-

Murcia Conjunctive framework (1999). On the other hand, content analysis carried out in this study will reveal the strengths and the weaknesses of students when engaging in writing, as writing involves the use of critical thinking skills. This could later be 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 students may face with the use of lexical cohesion: reiteration and collocation to link their ideas in a logical sense. In addition, there are numerous studies which investigated the linguistic features found in ESL academic writing but there has been no direct study which investigates how the use of certain linguistic features reflect the critical thinking performance.

Thus, this research aims to fill this gap by investigating how the use of lexical cohesion; reiteration and collocation could reflect critical thinking by the proficient and less proficient students of this study. 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 relation to writing to inculcate and enhance critical thinking among students in tertiary education institutions.

1.7 Scope and Limitations

The limitation of this study is the selection of the respondents were confined to one ethnicity of students, Chinese. The reason being that the participants were students of a National type secondary school in Petaling Jaya. As a result, the writing style of the participants have a very strong influence of their mother tongue where the 'direct translation' method is sometimes used in their writing.

In addition 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, the written samples of proficient and less proficient students. In other words, the researcher took into account only the positive and negative indicators identified by Newman, Webb and Cochrane (1995) in analyzing the written samples for 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 lexical cohesion, the researcher in this study focused on lexical cohesion: reiteration and collocation and how the use of these lexical cohesion devices may reflect the critical thinking characteristics identified by Newman et. al content analysis framework (1995). This means that the researcher again had to disregard the grammatical cohesive devices proposed by Halliday and Hasan (1976). In addition, the use of linguistic elements except the cohesive devices and other factors such as coherence of the written samples, learning strategies and cognitive development of the participants would not be taken into account with 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.

1.8 Conclusion

The following chapters will address the remaining components comprising this study. Chapter 2 will comprise literature relevant to the present study. Chapter 3 will be a description of the methodological steps followed in carrying out this study. Chapter 4 will present the results and

findings from the analysis of the data in connection to the research questions. And finally, in Chapter 5, the findings of the study will be concluded with theoretical and pedagogical implications and recommendations for future research.

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CHAPTER 2:REVIEW OF LITERATURE

2.1 Introduction

The present chapter is dedicated to reviewing the existing literature to present an overview of theoretical contributions and significant studies related to the study, this chapter comprises six major parts, namely: (1) historical development of critical thinking, (2) critical thinking in language learning, (3) critical thinking in writing, (4) academic writing, (5) cohesion and (6) lexical cohesion in academic writing.

2.2 Historical Development of Critical Thinking

To date, many scholars from various fields have made their contributions in defining or conceptualizing critical thinking, causing it to become a universal term in academic literature world (Cosgrove,2011; Minter, 2010; Petress, 2004). Most of the definitions of critical thinking can be traced back from the origins of at least three fields of study namely philosophical, cognitive psychological and educational (Lai, 2011). Therefore, definitions of critical thinking are said to be field-dependent.

For instance, John Dewey, (1973) who is renowned for his progressive education movement which stresses on the use of real life experience and tasks, reflective thinking and active learning, has been bestowed the title of the ‘father’ of the modern critical thinking tradition. He 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 knowledge in the light of the grounds that support it and further conclusion to which it tends” (Dewey,1933). To him, skillful reasoning is the key to critical thinking. Fisher (2011) further describes Dewey’s definition of critical thinking as a dynamic process through which individuals think independently,

posing questions, while insisting on the use of useful information to justify rational conclusions. He indicates that reasoning and its implication are essential to the process of thinking critically, due to the importance in presenting one's viewpoints.

Edward Glaser proposed a definition of this concept similar with Dewey's (Fisher, 2011):

An attitude of being disposed to consider in a thoughtful way the problem and subjects that come within the range of one's experience; knowledge of the methods of logical inquiry and reasoning; and 3) some skill in applying those methods (p.3).

Although the definition is very similar with Dewey's, he states the necessity of evidence to confirm ones' conclusions, as well as the need of the disposition to benefit from critical thinking skills (Fisher, 2011). Glaser designed Watson-Glaser Critical Thinking Appraisal (WGCTA), which is a well-known assessment tool for critical thinking. He takes all three steps of this definition into account by providing test takers with thought-provoking items, which require five forms of higher-level thinking: *inference, recognition of assumption, deduction, interpretation and evaluation of arguments*.

2.2.1 Critical Thinking – Peter Faicone

As reported by Peter Faicone, based on the consensus of 46 experts on Delphi Panel, critical thinking was defined as:

“Purposeful, self-regulatory judgement, which results in interpretation, analysis, evaluation and inference, as well as explanation of evidential, conceptual, methodological, criteria logical or contextual considerations upon which that judgement is based (P.A. Facione, 1990).”

Faicone (1990) claimed that the use of cognitive skills without affective dispositions to employ those skills might not be sufficient. He also maintained that though individuals might

develop the necessary cognitive skills for good reasoning, getting competent in using those skills is another challenge. According to a consensus among scholars in critical thinking research, metacognition should also be considered as an important element, as it allows individuals to understand and examine their own thinking (Faicone, 1990).

2.2.1.1 The Delphi Report

Faicone together with a group of leading figures from various academic fields have been collaboratively working on defining the term ‘critical thinking’, worked towards achieving a consensus regarding what ‘critical thinking’ is and providing insights regarding other issues of concern related to ‘critical thinking’. The outcome of their effort was the Delphi Report (Faicone, 1990). The Delphi Report provides the definition of ‘critical thinking’. Below is the full definition of critical thinking extracted from the Delphi Report (Faicone, 1990).

“We understand critical thinking to be purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which that judgement is based. CT (critical thinking) 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 judgements, 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 towards 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, Faicone, 1990)

In Delphi report (Faicone, 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 to be a good critical thinker. Both domains are deemed as important to ensure the success in producing ideal critical thinkers. The Delphi Report (Faicone, 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, the Delphi Report (Faicone, 1990) also includes some recommendations regarding the ways that can be used to integrate critical thinking into the learning curriculum and to assess critical thinking skills. Thus, the Delphi Report could be seen as a useful guideline for educators and education policy makers who plan to encapsulate critical thinking elements in the curriculum. Besides the definition of critical thinking provided in the Delphi Report (Faicone, 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.

2.3 Aspects of Critical Thinking

Robert Ennis (1993) expanded Dewey’s definition, viewing one’s own choices as basic aspects of critical thinking. On the other hand, Richard Paul considered metacognition to be an important element of critical thinking. He believes that the improvement of critical thinking abilities can result from thinking about one’s own thinking. He defines critical thinking as:

“Critical thinking is that mode of thinking – about any subject content or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them (Paul,1991)”.

Another critical thinking scholar, Michael Scriven’s (1997) definition is also of significance as he considers critical thinking as a learned academic competency, like reading and writing. He refers to critical thinking as ‘skilled and active interpretation and evaluation of observations and communications, information and argumentation’ (Fisher & Scriven, 1997). 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 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 that 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 judgements are to be supported by valid reasons and to do so, individuals need to be open-minded and fair-minded as stated in the Delphi Repot (Faicone, 1990).

Another scholar, Halpern (1990) claims that critical thinking is the use of 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 are able to exercise the critical thinking skills aptly (D.F. Halpern, 1999). Halpern (1999) also mentioned that critical thinking can be taught as an argument analysis with the use of reasoning skills.

Besides, all these researchers on critical thinking, Benjamin Bloom as cited by Jun (2011) also contributed much to critical thinking literature with his famous taxonomy of thinking processes. He demonstrates how our physic ability reaches its full potential when pieces of information are recalled, comprehended, applied in novel circumstances, analysed, synthesized to form new patterns and finally evaluated. These stages reveal much regarding how knowledge can gradually become deep routed by moving away from low-level forms of thinking (Krathwohl, 2002). In the light of Bloom's taxonomy, Geertsen (2003), in his opinion differentiated critical and reflective thought. He elaborated on twelve higher-order thinking skills, of which the first six involve critical thinking and "...seek to corroborate, firmly establish or strengthen..." (p.11), and the next six are reflective thinking and "...seek to extend, enlarge or explore..."(p.11). In other words, Geertsen's (2003) explanation on critical thinking is within the constraints of intellectual standards, while Bloom's taxonomy moves beyond to come up with unexpected, spontaneous and creative thought.

In comparison, 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 motion that critical thinking is similar with 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 as it is very evident that to solve a problem, a student should possess the critical thinking abilities to identify the problem and set parameters on the development of a solution.

To sum up, 'critical thinking' is taken as a form of thinking that involves important cognitive skills and dispositions. A critical thinker is willing, persistent, flexible, open minded and confident in using certain cognitive skills when it is necessary and appropriate (Ennis, 1987; Facione, 1990; Halpern, 1998, 2003). Pascarella and Terenzini (2005) listed various definitions of critical thinking and suggested that college level critical thinking skills include identifying assumptions behind an argument, recognizing important relationships, making correct references from data provided, drawing conclusions from the information or data provided, interpreting the merit of a conclusion based on available information, evaluating the credibility of a statement and its source and making self-corrections. The ultimate goal of critical thinking is to make decisions or solve problems in different situations with the appropriate use of critical thinking skills (Ennis, 1987; Halpern, 1998). The term critical thinking, as theorized by Ennis (1987) and Halpern (1998), represents a set of cognitive skills and dispositions which are conducive to decision making and problem solving in different situations. A clearer distinction to differentiate between critical thinking and problem solving is that, 'critical thinking' simply refers to the careful and precise thinking that is used to resolve some problems. These are some of the definitions and views related to the term 'critical thinking'.

After the definition of critical thinking by Faicone (1990) based on the Delphi Report has been discussed, the following section will explain in detail about critical thinking by Newman, Webb and Cochrane (1995) to compare and see which of the two is deemed more appropriate for my study.

2.3.1 Newman, Webb and Cochrane's Critical Thinking Indicators

In Newman, Webb and Cochrane's framework for critical thinking adopted from (Newman et al., 1995) was designed to analyse critical thinking performance in online learning. Their content analysis scheme had 'positive' critical thinking indicators and 'negative' critical thinking indicators. These critical thinking indicators were derived from Garrison's (1992) five-stage problem solving and Henri's (1992) cognitive domain 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's (1995) content analysis scheme was adapted and used in this study as they added other indicators to cover the possibility that the topic of discussion may include justification based on 'prior knowledge' to assess the critical thinking found in proficient and less proficient ESL learners' academic writing samples.

2.3.2 Newman et al.'s Model for Critical Thinking

Newman's framework was adapted for this study even though the original analysis scheme was mainly for online 'group' related interactions, where they believed that learning took place when there was 'group' interaction.

In this present study, the goal of research question 2 is to identify the critical thinking ratio in proficient and less proficient students' writing which is quite similar with analyzing the presence of critical thinking in written transcripts. Furthermore, the indicators do not attempt to evaluate the

depth of these cognitive skills but to identify critical and uncritical phrases, sentences, paragraphs or messages containing ‘one unit of meaning’, illustrating at least one of the indicators. Of course, one statement might show more than one indicator, such as presenting a new idea which widens the discussion but to ensure indiscrimination, each indicator was referred to only one aspect of critical thinking process and no two indicators were referred to the same aspect of critical thinking

In addition, this framework by (Newman et al., 1995) is suitable as all the indicators for cognitive skills are broad and can include different activities which have been grouped into several simpler well-defined criteria. For example, Henri (1991), in her indicators of judgement skills were: judging the relevance of solutions, making value judgements and judging inferences.

In principle, it was possible to classify units of language found in proficient and less proficient ESL learners’ academic writing samples used in this study by using Henri's cognitive skills according to her indicators (Henri, 1991). The following section will elaborate in detail (Newman et al., 1995) analysis scheme for critical thinking that was adopted as the theoretical framework of this study.

2.4 The Critical Mind and Language

Since language is the means of composing, any theory of composition should include a theory of language and its relation to thought. At the heart of Berthoff's (1984) theory of composition is the philosophical notion that ‘thought and language’ are interdependent and that this theory helps in teaching writing to remember that composing is designing ‘working concepts’ of the word that brings about ‘meaning’ to a composition. She believes ‘thought and language’ do not follow one another in a linear fashion; they are simultaneous, that is, ‘thoughts find words’ and ‘words find thoughts’. Humans use language to interpret and formulate meaning.

Many other researchers have put forward their views into 'language and thought' such as (Vygotsky, 1962) who believes that 'language and thought' develop together from 'congeries of unorganized heaps of information' to 'concept formations'. These views of thoughts were opposed by Piaget and Arnheim. Piaget (1980, p. 144) quoted that, the ability to form 'concepts' is the capability of the mind. The 'active mind' when it comes to writing starts with a perception which is a mental process. Perception and subsequent actions (necessary in schema theory) are described by Rudolf Arnheim (1969) in Visual Thinking, claimed that the 'cognitive operations' called thinking are not a 'mental process' but a 'perception'. These 'mental operations' such as active exploration, selection, grasping of essentials, simplification, abstraction, analysis and synthesis, completion, correction, comparison, problem solving, as well as combining, separating and putting in context, are few examples of 'mental operations'. In short, visual perception is active performance of the minds of both man and animal when they treat any cognitive material. The following section will explore how critical thinking is defined in writing.

2.5 Critical Thinking and Writing

Critical thinking skills do not stand alone as these skills tail another skill namely language skills. Critical thinking can be defined through the mental operations common to writing. Becoming a critical thinker is characterized by effective communication (Paul & Elder, 2008). This means that language clarity or more generally, the 'linguistic component' is a crucial part of critical thinking which can be reflected through writing. There are many qualities of text which enable critical thinking, the making of meaning and one of the quality that carries meaning is coherence, what students and some teachers call 'a smooth flow of ideas, or 'well linked'. Coherence of text depends largely on lexical ties, words with semantic (meaning) connections.

The creation of meaning by the writer depends very much on the placement of concept words which may become topicalized or thematicised, if placed in strategic slots in a text.

A definition of critical thinking that synthesizes these kinds of cognition that are essential to good writers, as they compose good academic writing, use the definition of the hypothetic (academic) prose style as the main criterion of 'good writing'. Critical thinking is a mental ability to organize, arrange, or manipulate the experiences or ideas by using schema or frames of reference, which William Perry (1970) calls 'structures'. The writer then uses his mental strategies to modify 'new' structures or ideas of additional information in a writer's schemata or schema by naming, defining, classifying, comparing, contrasting, and seeing relationships in hierarchies. Besides, critical thinking in writing is context specific and field-dependent involving background knowledge on certain subject matter (Emilia, 2010). It means that when the student's specialized knowledge of the topic to write sufficiently well where critical thinking can be identified.

McPeck (2016) explains 'field-dependent' in his book on 'Critical Thinking and Education' (2016), the author's analysis of what he calls the 'concept of critical thinking' is thinking about something specific. 'It is a conceptual truth', says McPeck (2016, p. 4), 'that thinking is always about x', and if the 'about x' is dropped, then 'critical' in turn itself becomes empty - as would 'gracefully' in 'She dances the waltz gracefully', if one were to drop the phrase 'dances the waltz'. This explains that in writing, critical thinking is field-dependent. In summary, every writing is topic or theme/context controlled. The following section explains where critical thinking is linked to qualities of a text

2.6 The Critical Mind and Thematic Qualities of a Text

Teachers at all levels are interested implicitly in a student's thinking as they guide and/or intervene in a student's thinking process. This is demonstrated in a writing activity by a student

where the teacher is inviting the student to demonstrate both thinking and language capabilities which share a close relationship with each other. This is proven by Vygotsky (1962) when he claims that ‘thought development’ is determined by language which is also the ‘linguistic tool of thought’. In short, the concepts of schema, formal thinking, and dialectical thinking which is the process of the active mind is successful in producing cohesive, coherent texts.

Accepting this unison of the critical mind and text production, (Langer, 1993) and (Phelps, 1985) came up with the integration theory of cognition and language which unites the mental process and coherent product of the writer in an integrative theory of coherence where ‘thought’ is the process of the mind and ‘product’ is the process of a writer mediated in words or lexicon

In addition, the definitions and principles of text as determined by discourse analysts apply to writing. The following analyses by discourse analysts such as de Beaugrande, Yule and Brown, Van Dijk and Kintsch are offered as a theoretical base before taking a closer look at, ‘*Cohesion in English*’ by Michael A. K. Halliday and Ruqaiya Hasan (1976).

Those authors and speakers who have enunciated the writing-thinking connection most eloquently, include Janet Emig (1997); Janice Lauer, (1985); Richard E. Young, (1994); Jay Robinson,(1990); Ann S. Berthoff, (1984); C. H. Knoblauch, (1983); Lil Brannon, (1981); (Emig, (1977); Elbow, (1981); Murray,(1090) and Graves, (1983).

2.7 Halliday and Hasan (1976) Cohesion Theory

M. A. K. Halliday and Ruqaiya Hasan have written a very thorough description of cohesion in English texts. To explain the general meaning of cohesion, Halliday and Hasan say that the general meaning is embodied in the concept of text. Cohesion helps to create text by creating texture (298). "the textual, or text-forming, component of the linguistic

system, of which cohesion is one part" is what creates text (299). "Within the textual component, cohesion plays a special role in the creation of text. Cohesion expresses the continuity that exists between one part of the text and another" (299). (Thematic patterns and information structure - organization - are also part of texture.) The following section will explain the role of cohesion and types of cohesion used in writing.

2.8 Cohesion in Writing

Halliday & Hasan (1976): '*Cohesion in English*' suggested that "cohesion is part of the language system" (p.5). and asserted that cohesion in text is determined by the "relations of meaning that exist within the text, and that define it as a text" (p. 5). Likewise, Hoey (1991) defined cohesion as "the way certain words or grammatical features of a sentence can connect that sentence to its predecessors (and successors) in a text" (p. 3). Another researcher, Carter (1998) provided similar definition by stating that "the term cohesion embraces the means by which texts are linguistically connected" (p. 80) and (Amanda C. Jobbins, 1998) in her study stated that lexical cohesion is expressed through the vocabulary used in text and the semantic relations between those words and Amanda (1998) added that identifying semantic relations in a text can be a useful indicator of its conceptual structure.

Based on Halliday and Hasan's (1976) theory on lexical cohesion, cohesion can be established by various means. Halliday and Hasan classified cohesion under two types: grammatical and lexical. *Grammatical cohesion* is expressed through the grammatical relations in text such as ellipsis and conjunction and *Lexical cohesion* is expressed through the vocabulary used in text and the semantic relations between those words.

2.8.1 Grammatical cohesion

Grammatical cohesion includes reference, substitution, ellipsis, conjunction, and lexical relationships. Based on the classification of the sub-categories by Halliday and Hasan (1976), *reference* can be grouped into four categories: *pronominal*, *demonstrative*, *definite article ‘the’*, and *comparative*. *Substitution* has been classified into four sub-categories, too: *one / some / ones* (as substitutes of *noun phrases*), *do so / it / that* (as *substitutes of predicate*), *here / there / then* (as substitutes of *adverbials*), and finally, *so / not* (as *substitutes of clauses*). *Ellipsis* has been divided into three sub-categories: *noun phrases*, the *predication*, and a *clause*. The fourth is *conjunction*, which can be subcategorized into five: *additive*, *adversative*, *causative*, *temporal* and *continuative*.

2.8.2 Lexical cohesion

The fifth is *lexical cohesion* which consists of two sub categories namely *reiteration* and *collocation*. Lexical cohesion arises from the selection of vocabulary items and the semantic relationships between them. For example, ‘*I parked outside the library, and then went inside the building to return my books*’, where cohesion is represented by the semantic relationships between the lexical items ‘*library*’, ‘*building*’ and ‘*books*’. The following section will explain in detail the role of *lexical cohesion* in a writing.

2.9 Lexical Cohesion

Lexical Cohesion: Halliday (1985) also developed a general category to classify lexical cohesion items. The general categories are *repetition*, *synonymy* and *collocation*. *Repetition* refers to the use of the same word; but *synonymy* includes *synonymy*, *hyponymy*, *meronymy*, *co-hyponymy*, *co-meronymy*, and *antonymy*. **Collocation** includes *words associated to a topic*, *opposite or contrast*, *low frequency words* and *co-occurrence of words*. In short, lexical cohesion, provides the “continuity of words” with the repetition of lexically related words or phrases. This

process develops through the choice of word or phrase that is lexically related to the previous word, words or phrases (Halliday,1994).

For automatic identification of these relationships, it is needed to discover these types of relationship between words in a text. In a sentence, to define **lexical cohesion**, all the sub categories of **reiteration** and **collocation** need to be categorized separately in their respective categories. The following sub sections will explain the two types of lexical cohesion: reiteration and collocation in detail.

2.9.1. Reiteration

Reiteration means iterating the *same word, group of words, phrase or phrases* to recall the first usage of the element or elements; Reiteration is subdivided into four cohesive effects: **word repetition** (e.g. *boys and boys*), **synonym** (e.g. *ascent and climb*) which includes *near-synonym* and *hyponym, superordinate* (e.g. *lecture and task*) and *general word* (e.g. *society*). The effect of *general word* is difficult to automatically identify because no common referent exists between the *general word* and the word to which it refers.

2.9.1.1 Word repetition: Word repetition ties in lexical cohesion are identified by same word matches and matches on inflections derived from the same stem. An inflected word was reduced to its stem by lookup in a lexicon (Keenan and Evett, 1989) comprising inflection and stem word pair records (e.g. "*orange oranges*").

2.9.1.2 Repetition through synonymy

Occurs when words share the *same meaning* but have two unique syntactical forms.

Example: 'A domestic violence act encompasses **domestic beating** during a **domestic fight**.'

2.9.1.3 Word association through superordinate

Occurs when a *specialized / generalised* form of an earlier word is used, for example: ‘*The murder weapon, a knife was found at the crime scene.*’

2.9.1.4 Word association through General word

This occurs when a *relationship* exists in a text, for example: ‘*The **society** should play an active role in reducing crimes happening in the country.*’

2.9.2 Collocation

Collocation refers to a group of two or more words that usually go together and are located together. Collocation is sometimes referred to as a group of two or more words that like to ‘hang out’ together. Examples of common collocations are ‘*make tea*’ and ‘*do homework*’

Even though it is possible to use other word combinations, understanding collocations help English learners improve their fluency because they are words that usually go together. Halliday and Hasan (1976) claim that the ‘most complicated’ part of lexical cohesion is collocation; i.e. cohesion, “achieved through the associations of lexical items that regularly co-occur” (Halliday & Hasan, 1976, p.284). The lexico-semantic relations can be provided by *opposite (antonymy)* relations, part of ‘whole’ or ‘partial relation’, and by *hyponymy* between lexical items. All these patterns constitute collocations which are lexically connected words, groups of words, phrase or phrases through the text. A collocation is a predisposed combination of words, typically pairwise words, that tend to regularly *co-occur* (e.g. *orange peel*).

2.9.2.1 Word association through collocation

These types of relationships occur when the nature of the association between two words cannot be defined in terms of collocation, for example, ‘*Osama bin Laden*’ and ‘*The World Trade Centre*’.

2.9.2.2 Word association through Antonyms

Antonyms are words that are exact semantic opposites or ‘complimentaries’, e.g. *male-female*, *boy-girl*, *adult-child*, for example, ‘*All the **boys and girls** in the class were asked to carry out the same task.*’

2.9.2.3 Word association through Low Frequency words

A *high frequency* word is commonly used in writing, such as the word ‘*the*’, whereas a *low frequency* word is not commonly used, such as the word ‘*multifactorial*’.

2.9.2.4 Word association through Co-occurrence of Words

A collocation is a sequence of words or terms that co-occur more often than would be expected by chance. In phraseology, collocation is a sub-type of *phraseme*. An example of a *phraseological collocation*, as propounded by Michael Halliday (1976) is the expression ‘*strong tea*’. While the same meaning could be conveyed by the roughly equivalent ‘*powerful tea*’, this expression is considered excessive and awkward by English speakers. Conversely, the corresponding expression in technology, ‘*powerful computer*’ is preferred over ‘*strong computer*’. *Phraseological collocations* should not be confused with *idioms*, where an *idiom's* meaning is derived from its convention as a stand-in for something else while collocation is a mere popular composition. Collocations are partly or fully fixed expressions that become established through repeated context-dependent use. Such terms as ‘*crystal clear*’, ‘*middle management*’, ‘*nuclear family*’, and ‘*cosmetic surgery*’ are examples of collocated pairs of words. As collocation raises some difficulty in understanding and identifying them, the following section will shed some light on the variety of collocations.

2.9.3 Spectrum of Collocations

Below is a spectrum of collocations adapted from Howert (1996) and Carter (1987). This spectrum of collocations gives a better understanding of Halliday and Hasan's taxonomy of lexical cohesion. There are about three main types of collocations: *Free Combination*, *Restricted Combination* and *Multiword Expressions*.

2.9.3.1 *Free Combination*

Free Combination consists collocations known as '*verbs + prepositional phrase*' or *phrasal verbs*, for example '*run a risk*', '*make an attempt*', '*adverb + verb*', for example, '*readily admit*', '*totally unaware*', '*verb + noun*', for example, '*drama queen*', '*controlling wife*' and '*noun + noun*', for example, '*orange peel*', '*school teacher*'.

2.9.3.2 *Restricted Combination*

Restricted Combination include collocation such as '*Osama bin Laden*' and '*The World Trade Centre*'. These types of relationships occur when the nature of the association between two words cannot be defined in terms of collocation.

2.9.3.3 *Multi-word Expressions*

Multi-word Expressions are irreversible *binominals* such as '*part and parcel*', '*leaps and bounds*', *phrasal verbs* such as '*pull out*', '*give up*' and *idioms* such as '*to take the bull by the horns*', '*to set the ball rolling*'.

It is clear from the spectrum of collocations presented above that lexical items in the language can be put into what J. R. Firth call "mutual expectancy". The words that are closely associated with others may depend on their association with the context of a particular situation. Context here refers to who is using them and where they are being used. For instance, '*power*

struggle’, ‘*power boat*’, ‘*power house*’, and ‘*power steering*’ all collocate easily and will be used freely in English in different contexts.

2.9.4 Identifying collocation in a text

Despite collocation being hard to identify, there are some factors that simplify the designating or guessing which vocabulary items contribute to the cohesion in texts and which have the potential to be ‘connected or disconnected’. First is the *degree of proximity* in the lexicon. This means that the words with a high degree of proximity to occur together create cohesion with collocation in a text. In addition, the distance between two lexical items also affects their potential connection. This distance is created by the number of words, clauses or sentences. For example, in a sentence there can be a *synonymic relation* between two lexical items that have a greater or fewer number of words separating them for example, ‘*eating greedily*’ has a *higher synonymic relation* than ‘*eating her lunch greedily*’. Finally, there is the *frequency* factor. Roughly, one lexical item that shows high frequency use in language tends not to be connected to another item with high frequency. For instance, Mary has a habit of *eating greedily*. *She was eating her lunch greedily at the restaurant just now*. ‘*Eating*’ is a highly frequent word, in the two sentences, as a result cohesive collocation between them is really hard to build directly (Halliday & Hasan, 1976). The framework used in this study will be discussed in the following section.

2.10 Framework for this study

The framework employed to analyse lexical cohesion for this study is the Taxonomy of Lexical Cohesion established by Halliday and Hasan (1976). By adapting this framework to analyse lexical cohesion found in proficient and less proficient students’ writing, the frequency use of reiteration and collocation were identified and the percentage was calculated over the total word count of the written samples.

Table 2.1: Halliday and Hasan (1976) Taxonomy of Lexical Cohesion

Adaptation of Halliday and Hasan's Framework for Cohesion Types and Categories of Lexical Cohesion in Cohesion (SAMPLE __)				
Reiteration	Proficient Students		Less Proficient Students	
	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Repetition				
Synonym or near-synonym				
Superordinate word				
General word				
TOTAL				
Collocation	Proficient		Less Proficient	
	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
Association with a particular topic				
Opposition or contrast				
Membership in ordered sets				
Membership in unordered sets				
Low frequency words				
Co-occurrence of individual words				
Total				

Based on Table 2.1 all the four sub categories of reiteration and six sub categories of collocation in the written samples will be identified and tabled. The following section will discuss about academic writing.

2.11 Academic Writing

Academic writing requires a complete, active engagement with the facts and principles of a discipline (Rose, 1985). Furthermore, Elder and Paul (2006, p. 38) indicate that academic writing process involves “intimate connection between the ability to write well and the ability to think well”. Arkoudis and Tran (2007) further add that academic writing as a ‘form of

thinking' fundamental for academic success of students. Hyland (2007) also highlights that as a 'form of thinking' especially in tertiary literacy, students' ability in sustaining arguments and synthesizing ideas to write in English for academic purposes is crucial for academic success.

Later, Ansarimoghaddam and Tan (2014), and Mansourizadeh and Khairi (2014) also indicated that academic writing is a major language skill used for communicating and developing ideas. Academic writing experiences in the context of "integrating disparate ideas, synthesizing perspectives, and extending theory which demands higher-level construction skills and perspective-taking, as well as greater concern for accuracy, voice, and audience" (Lavelle & Bushrow, 2007, p. 809).

Many students, do not find it easy to write up their academic work into an acceptable form. This is made more difficult when students need to write in English as a second language by their lack of familiarity with the conventions and expectations of academic writing in English medium universities (Ballard & Clanchy, 1997). As Dong (1997: 10) notes, academic writing involves learning a new set of academic rules and learning how to play by these rules. Often these rules change from discipline to discipline, and the audience and the purpose of writing vary according to each writing context. For non-native students, the mismatch of writing difficulties and expectations operating in their home countries compounded their writing difficulties.

According to another research, (Ting, 2013) explains that academic writing at university level is of higher level and a different writing nature from writing done at school. Examples of writing done at universities are academic writing (Paltridge, 2004) and personal essays (Sasaki & Goldner, 2001). Writing in Malaysian language classrooms, on the other hand, usually include *narratives, descriptions, discussions* and *general essays* where students spend a great deal of time expanding notes in guided writing tasks. In their writing, school students are expected to draw

upon their own ideas and develop coherent writing but university writing is characterized by ‘inter-textuality’ and university students are expected to not only quote relevant authoritative sources of information but to take a ‘critical and questioning’ attitude to the knowledge. As such, the writing skills learnt in schools are often not adequate in preparation for writing requirements at universities (Cullip & Carol, 2001).

(Singh, 2016) in her research states that academic writing requires a complete, active engagement with the facts and principles of a discipline (Rose, 1985). Furthermore, Elder and Paul (2006, p. 38) indicate that academic writing process involves “intimate connection between the ability to write well and the ability to think well”. Arkoudis and Tran (2007) further add that academic writing as a form of thinking which is fundamental for academic success of the students. Hyland (2007) also highlights that as a form of thinking especially in tertiary literacy, students’ ability in sustaining arguments and synthesizing ideas to write in English for academic purposes is crucial for academic success. Later, Ansarimoghaddam and Tan (2014), and Mansourizadeh and Khairi (2014) also indicated that academic writing is a major language skill used for communicating and developing ideas. However, tertiary learners struggle in creating a coherent and extended piece of writing to share their research findings with other researchers around the world.

A research conducted to compare second language and native English speaker student writing suggests that the writing of each group is different in ‘numerous and important ways’ (Silva, 1997: 218). There are often differences in general textual patterns, argument structure, use of background reading texts, reader orientation, patterns of cohesion, the construction of sentences, and lexical choices (Silva, 1997). The research has also reported differences in the composing processes of native and non-native speaker student writers (see Silva, 1993; 1997). Silva (1997)

argues that these differences between the writing of native and non-native speaker student writers, need to be acknowledged and addressed, if second language students are to receive fair treatment, and an equal chance in academic success. There are many factors that influence decisions students make while writing an academic text. These include the purpose of the text, the academic and cultural context of the text.

In addition, academic writing experiences in the context of “integrating disparate ideas, synthesizing perspectives, and extending theory which demands a higher-level construction skills and perspective-taking, as well as greater concern for accuracy, voice, and audience” (Lavelle & Bushrow, 2007, p. 809). On the other hand, (Ghasemi, September 2013) claims that writing as one of the second language skills is really arduous. According to Richards and Renandya (2002) the difficulty emanates both from generating and organizing ideas and translating these ideas into readable text. The following section will discuss argumentative writing as one of the components of academic writing.

2.11.1 Argumentative Writing

Among other types of writing, argumentative writing is considered the writing mode that best reflects student’s critical thinking. In expository writing for instance, idea development can be done through classification, cause and effect, procedural or analytic exposition involving logic as the basic of critical thinking. However, in this type of writing there is no refutation as what is required in argumentative writing to defend the claim. Recognizing opposing argument and making counter argument belong to elements of argumentative writing. Because arguments deal with probabilities, they must be qualified to convince readers (Hillocks, 2011). Therefore, in this study argumentative writing is chosen to assess student’s critical thinking skills. Student’s argumentative writing can be used to measure not only the writing performance but also critical

thinking skills. Student's writing performance is mostly indicated by the quality of the writing product, which focuses on its clarity, originality and correctness (Rahim et al., 2008). The critical thinking skills can be assessed on the elements which are reflected from the main aspects namely argument, evidence, recognition of opposition, refutation, conclusion, references, and fallacies (Stapleton, 2001). Argument or writer's view point on a topic is presented in the form of claims supported by a reason. Evidence constitutes statements or assertions which serve to strengthen the argument. Recognition of opposition refers to the identification of statements that run counter or offering alternative interpretations to those expressed in the claim. The ability to persuade via good argumentation skills has long been recognized as one of the key determinants of good critical thinking ability, not only as a scholarly pursuit, but also as a means to persuade during casual discussions. Argumentation is the practice of stating claims and offering support or reasons to justify beliefs to influence others (Inch & Warnick, 2010), and good argumentation skills are required for effective communication (Nussbaum & Schraw, 2007). (Fulan Liu, 2014) in her findings claim that in argumentative writing, the writer presents arguments on an issue to persuade the reader to agree with a particular point of view (Chandrasegaran, 2008; Rothery, 1996; Schlepppegrell, 2004). Within such a framework, persuasiveness is defined as the extent to which a writer of an argumentative essay can convince her readers on a certain stance taken. The importance of including counterarguments and rebuttals for making written argumentation persuasive has been underscored by much research (Kuhn, 1991; Leita, 2003; Van Eemeren, Grootendorst, & Henkemans, 1996; Walton, 2007). Kuhn (1991), for example, holds that at the core of competent argumentative reasoning is the handling of supporting elements, alternative views and counterevidence, while stating the writers' failure to 'envision conditions that falsify their own theory' (p.117), is the main obstacle to effective argumentation and critical thinking.

Indeed, neglecting alternative views has been considered a common weakness in the argumentative writing of students at the both secondary (Ferretti, Lewis & Andrews-Weckerly, 2009; McCann, 1989; Yeh, 1998) and tertiary (Nussbaum & Schraw, 2007; Wolfe & Brit, 2008) levels. As we have seen, however addressing opposite or alternative views and responding to them (rebutting) is a critical element of persuasiveness in written argumentation. Furthermore, counter argumentation has been perceived as a hallmark of critical thinking (Palmer, 2012), which is stipulated as one of the main goals of education. The relationship between writing and critical thinking is discussed in the next section.

2.12 Writing Activity and Critical Thinking

According to Gocsik (2002) writing helps to develop critical thinking skills as writers need 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 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. In reformulating design through two concepts of critical thinking and language through lexical cohesion (Langer, 1993) and (Phelps, 1985), process and product as well as the critical thinking of the 'writer and the reader' in an integrative theory of coherence. Text design can be understood by a flow of meaning from writer's text to reader' text, hence the text plays an important tool to evaluate critical thinking. Past studies related to this study will be presented in the following section.

2.13 Past Studies

2.13.1 Past Studies related to Critical Thinking in Writing

Since assessing participants critical thinking performance is one of the objectives of this research, the framework which was used to assess critical thinking skills and performance found in the proficient and less proficient students' writing was Newman, Webb and Cochrane (1995). There are several frameworks available to assess critical thinking performance of participants.

Firstly, a study done by Siti Zaidah (2016) who researched on the effects of training in the use of Toulmin's model on ESL students' argumentative writing and critical thinking ability. This study presented and discussed an approach that used the Toulmin's model of logical reasoning, which incorporated questioning techniques to provide scaffolding for students' argumentative

writing and critical-thinking ability. Students with low language ability were able to learn how to think constructively and develop appropriate critical-thinking skills for argumentative writing. This research had pedagogical considerations for enhancing the teaching and learning of argumentative writing for teachers and ESL practitioners alike.

Another action-research pilot study was designed by Landis (2000), 'Evaluating Critical Thinking in Class and Online: Comparison of the Newman Method and the Facione Rubric' was to determine which of the two methods, the Newman or the Facione, were most reliable to assess students' critical thinking. Based on the findings of this study, the Newman method was time consuming and it appeared to have difficulties as there was no guidance on the length of each unit of analysis as other researchers. Related to this study, Sherry, Gavalin, and Billing (2002) questioned how much of a given sample was needed to make sense of the nature of critical thinking that is occurring. On the other hand, Facione's holistic method did gain higher levels of reliability and easier application to large samples of discussion.

Another study, 'Writing and Critical Thinking' by Chen (2017) examined whether a relationship exists between critical thinking and English writing courses. The researcher hypothesized that writing promotes critical thinking and the cognitive process of writing. The findings of this study showed that there was a relationship between writing and critical thinking. Writing courses were positively correlated with critical thinking. The critical thinking models by various researchers are shown in Table 2.2 below.

Table 2.2 Summary of Critical Thinking Models Adopted from Murphy (2004)

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 information	-

The summary of the above Critical Thinking Models delineates the dimensions that are related to the studies of critical thinking ranging from definitions to its manifestation in the educational arena. The following section will explain previous studies regarding critical thinking and writing.

Table 2.3 Past Studies regarding Critical Thinking and Writing

Author/Year	Sample	Objectives	Findings
Ryan Patricia Rogers (2017)	undergraduates in a science course	Investigated the relationship between critical thinking and writing a research.	There was a significant relationship between critical thinking and writing a research as it promoted problem solving skills.
Zhengwei Pei(2017)	110 English majors across three grades at two universities	Investigated CTS by giving the critical thinking skills (CTS) test and EFL argumentative writing test	Though their CTS was not found to be significantly correlated with EFL argumentative writing performance, textual analysis of typical essays

			showed that strong-CTS learners out performed weak-CTS ones in relevance, clarity, logicity, profundity and flexibility of argumentative writing.
Ainon Omar (2016)	secondary school students from one of the pioneer schools selected by the Ministry of Education	to determine whether the teachers' implementation of the Thinking maps promoted critical thinking during the teaching of Literature in the ESL classroom.	The findings revealed that the teachers were able to engage students to think critically use the thinking maps during their literature lessons.

The above studies confirm that the relationship between critical thinking and writing is significant. The significance of critical thinking present in writing is further supported by McCall (2016) who studied on '*Bridging the Divide: Integrating Composition and Second Language Writing Approaches to Transfer*', and researchers (Ng & Shyang, 2016) who researched on '*The Relationship Between Critical Thinking Skills and Vocabulary Knowledge in Academic Writing of ESL University Students*.'

2.13.2 Past Studies related to Lexical Cohesion in Writing

There are many past studies related to lexical cohesion based on Halliday and Hasan (1976). *Cohesion in English*. To begin with, collocation is claimed by Halliday and Hasan as "the most problematic part of lexical cohesion" (284). Meanwhile, they recognize collocation as an important part of creating cohesion in connected text although collocation as claimed by Halliday and Hasan as "the most problematic part of lexical cohesion" (284). Even Nakhimovsky and Leed (1979) state that collocations are difficult to produce for second language learners. In most cases, the learner cannot simply translate word-for-word what she / he would say in her / his native language. For example, the word-for-word translation of '*to open the door*'. In contrast, translating word-for-word the expression: '*to break down ~ force the door*' is a poor strategy. The co-

occurrence of 'door' and 'open' is an *open or free combination*, whereas the combination 'door' and 'break down' is a collocation. Native speakers of English would not produce 'to break down a door' because they are aware of the construct.

Halliday's and Hasan's (1976) taxonomies were used in relation to composition and writing research where the results showed that the 'highly rated essays' contained less errors but have more syntactic complexities. as the ideas in the 'highly rated essays' were highly detailed and more connected. In general, the study showed that writers of 'low-rated essays' used more reiteration than collocation. More related to the present study, Witte and Faigley found that 'majority lexical ties' (65%) in the 'low-rated essays' were repetitions. McGee (2009) found that reiteration can lead to redundancy and hence weakens the writing quality. McGee's finding is important because the common belief is that reiteration is important because it enhances the writing quality.

In a study by Castro (2004b) that compared the degree of cohesion in the essays of 30 Filipino college freshmen. Although no significant differences were found among the low, mid, and high rated essays on their choice of grammatical and lexical cohesive devices, she finds the results pedagogically useful for ESL writing instructors who can teach students the appropriate cohesive markers and discuss their importance in composition writing. Witte and Faigley (1981) noted that writing quality is not all about lexical cohesion, yet it must not be ignored as the use of lexical cohesion is important to include all different kinds of lexical ties; i.e., *same item*, *synonym*, *super-ordinate*, *general word*, and collocation. In other words, having a high number of one lexical item will clearly affect the writing quality. (Halliday and Hasan, 1976: 279–80).

In 1933, Harold Palmer's *Second Interim Report on English Collocations* highlighted the importance of collocation as a key to producing natural-sounding language, for anyone learning a foreign language. Thus from the 1940s onwards, information about recurrent word combinations

became a standard feature of monolingual learner's dictionaries. As these dictionaries became 'less word-centred and more phrase-centred', more attention was paid to collocation. This trend was supported, from the beginning of the 21st century, providing a more systematic account of collocation in dictionaries and it was discovered that by using these tools, dictionaries such as the *Macmillan English Dictionary* and the *Longman Dictionary of Contemporary English* included boxes or panels with lists of frequent collocations.

Reynolds (2001) study related to both descriptive and persuasive essays, and the study questioned whether there was any relation between lexical repetition and the topic of the task. The results of this finding concluded that the tendency of repetition correlates with the length of the essay, where students feel the necessity of explaining the old information they already talked about instead of coming up with new lexicon.

By the application of Halliday and Hasan's (1976) framework, a great many of studies about cohesion and coherence in ESL / EFL writing and even in English itself (Jafarpur, 1991; Johns, 1980; Johnson, 1992; Zhang, 2000; Hartnett, 1989 cited in Johnson, 1992) have been done. Although some researchers came to similar findings, the findings of these studies in some cases have been somewhat contradictory. Some have found that there is no difference in the use of lexical cohesion devices in good and weak writings (Johnson, 1992; Zhang, 2000). Others showed that high-rated essays are different from low-rated ones in the use of lexical cohesion devices (Jafarpur, 1991). Some researchers proved that high-rated essays contain more cohesion than low-rated ones (Jafarpur, 1991). Furthermore, it is commonly believed that high-rated essays include more lexical collocations than low-rated ones (Johns, 1980; Zhang, 2000). They also justified that lexical cohesion is the most commonly used category in both good and weak essays, followed by conjunction and reference (Johns, 1980; Zhang, 2000).

In the writing of ESL / EFL learners, some peculiar features have also been identified by researchers such as (Olateju, 2006; Khalil, 1989; Wikborg, 1990; Dueraman, 2007). Olateju (2006) stated that some of the lexical cohesion devices were used wrongly or insufficiently and this may be associated to the insufficient direct exposure to the English and the misuse of these affected or even broke the coherence of the text. These studies explicitly bespoke that cohesion is a significant underlying feature of any type of writing and that L1 and L2 learners of English have considerable difficulty in applying lexical cohesion devices. Novice writers ten to one will use more lexical cohesion devices to produce a superficially logic text but may lack logicity in their writing. Correct use of strong collocations shows an excellent command of the English language, and can certainly help impress native speakers' of one's ability to speak English well.

2.14 Conclusion

From the literature presented, lexical cohesion and critical thinking are significant elements that reflect the competency of the English language of a proficient and less proficient student. The next chapter highlights the methodology adopted in this research. A detailed explanation on the participants and interview session carried out will be elaborated in the next chapter.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

It is clear that being able to foster critical thinking among students has become a shared goal for global tertiary educational institutions. In line with this emerging goal of education, this study focuses on critical thinking by investigating the relationship between critical thinking performance and lexical cohesion in a proficient and less proficient students' academic writing.

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

3.2 Research Design

This study adopted a mixed method research as supported by Johnson, Onwuegbuzie and Turner's (2007) definition of mixed method research as stated 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 method research as it combines both quantitative and qualitative data analysis methods.

This mixed method research design rationale is that it allows the researcher to fuse both quantitative and qualitative data analysis methods under one single study when analyzing

qualitative data. The data was made up of seventy-eight written transcripts. In other words, a single type of data could be analysed twice using two types of 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 are concerned. This is one of the recognized advantages of quantitative data analysis is it can produce numerical values through counting and measurement (Y. Zhang & Wildemuth, 2009) which will exhibit the result of numerical data. Unlike qualitative data analysis method where the outcome is not in numerical values. Instead, qualitative data analysis method is advantageous for those researches 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 the 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 pattern of relationship between critical thinking performance and lexical cohesion in a proficient and less proficient students' academic writing and how the use of lexical cohesion reflects the critical thinking ratio. Therefore, by combining both data analysis methods, different insights will be yielded, which in turn makes the outcome of the research a more rewarding one by enhancing the breadth and depth of understanding and corroboration of a study. In the following section, details regarding the participants and the setting of this study will be presented.

3.3 Participant and Setting

The academic writing samples which will be used as data for this study was collected from a public national-type high school located in the Klang Valley. Participants of the academic writing samples were high school students who were in Upper Six, more commonly known, Sixth formers (pre-university) studying in that public school. The participants for this study were students from

both the Arts, Science and Pure Science stream. These Sixth formers will be taking the Sijil Tinggi Persekolahan Malaysia (**STPM**, English: Malaysian Higher School Certificate), a pre-university standardized examination taken by students in Malaysia. It was formerly known as the Higher School Certificate (HSC). STPM is one of the two major pre-university systems for admission to Malaysian public universities. The other is a one-year matriculation programme conducted by the Ministry of Education. Those applying for public universities in Malaysia, however, must also have taken the MUET (Malaysian University English Test). The MUET is compulsory for all STPM (Sijil Tinggi Persekolahan Malaysia) and matriculation students, as well as diploma and pre-university students who wish to pursue first degree programs in local universities.

3.3.1 MUET (Malaysian University English Test)

Unlike International English Language Testing System (IELTS) and Test of English as a Foreign Language (TOEFL) which are globally accepted as the certification of English language proficiency, MUET is recognized only in Malaysia and Singapore (National University of Singapore, Nanyang Technological University and Singapore Management University).

Students who have taken **MUET** are eligible to be enrolled into degree courses offered at local public universities as long as their CGPA for STPM fulfil the entry requirement. The difference between all these bands is that students from bands 1 and 2 are required to take two extra English courses during their holidays while bands 3 and 4 students are only required to take only one extra course. Students with bands 5 or 6 can skip the extra English course.

The minimum MUET requirement will be increased according to the field of study: Band 2 for arts and social sciences, Band 3 for science, technology, engineering and mathematics (STEM) courses and Band 4 for law and medical courses.

The MUET tests consists four components — listening, speaking, reading and writing. The scores of each component is graded into six bands with Band 1 as ‘extremely limited user’ and Band 6 as ‘very good user’.

For this study, the researcher, who was also their MUET teacher had verbally informed the participants that their academic writing scripts would be collected and used as the data for this study. The participants were also informed verbally about the aim of this study and at the same time assured that their identity would not be disclosed in this study. The participants willingly gave the researcher consent to proceed by getting their consent formally in the consent forms distributed to them. The researcher also got permission from the school principal. The following section will elaborate on the design of the study

3.4 Design of the Study

The figure on the next page shows the design of this study and the information is outlined after the flowchart.

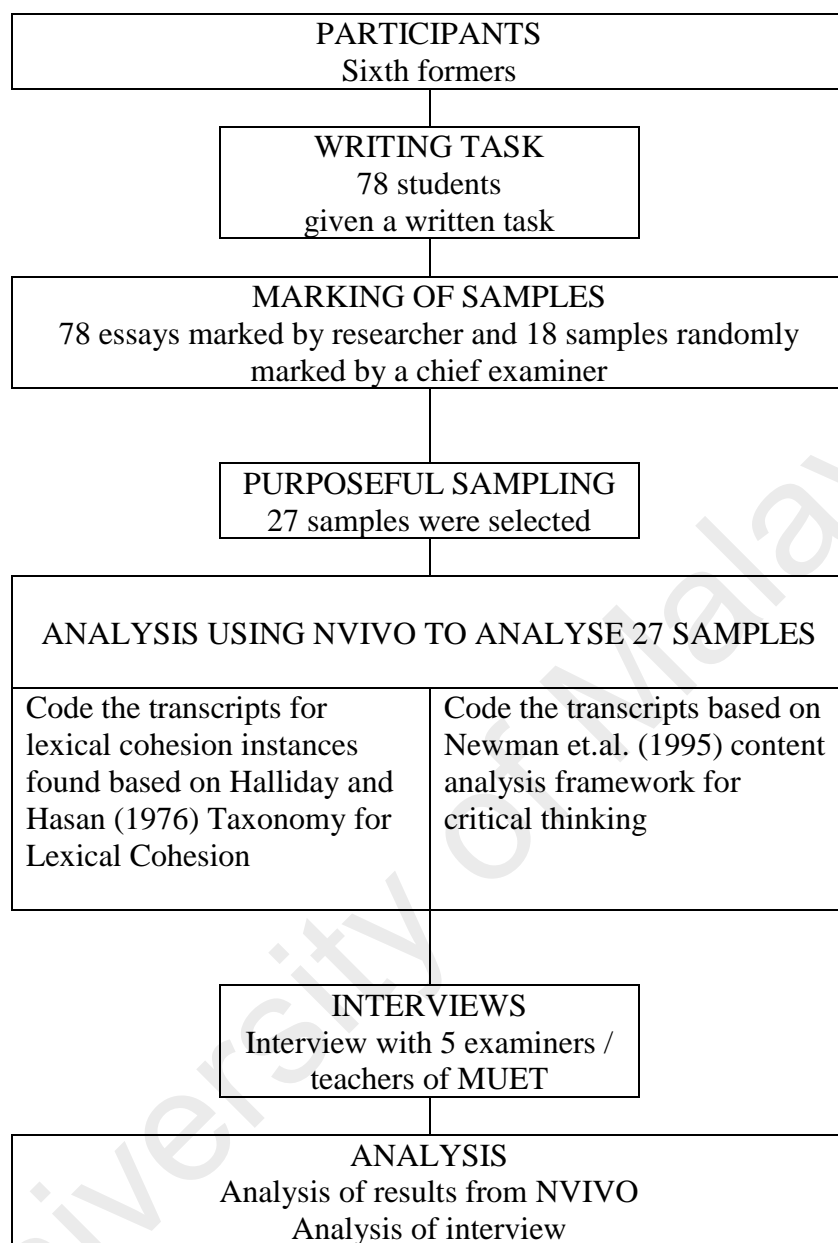


Figure 3.1: Data Collection Procedure

3.4.1 Data Collection Procedure

The question for the academic writing was given to the 78 Sixth formers from four different classes on the same day but at different MUET lessons during school hours. Their respective teachers helped the researcher to carry out the written assignment in their respective classes within a time limit of 90 minutes. The writing scripts were collected at the end of the given time.

After the researcher had compiled all the 78 written transcripts, the researcher (examiner 1) then marked each of the 78 transcripts using the MUET marking scheme to get a score. Following that 18 transcripts were randomly remarked by a second assessor, who is a chief examiner for MUET (examiner 2), appointed by the Examination Council of Malaysia to validate the marking of the researcher. This step is taken to ensure that the inter-rater reliability is deemed acceptable. The samples were labeled from written transcripts (WT) 1 until written transcripts (WT) 78, written transcript 1 being the academic writing transcript from the highest score of 49 marks and written transcript 78 being the essay from the lowest score of 10 marks. The Table in the following page presents in detail the scores of the 78 marked transcripts and the selection of proficient and less proficient participants' written transcripts.

Table 3.1: Selection of Proficient and Less Proficient Written Samples

SELECTION OF WRITTEN TRANSCRIPTS FOR THE STUDY											
PROFICIENT / LESS PROFICIENT PARTICIPANTS	WRITTEN TRANSCRIPTS (WT)	EXAMINER 1 (RESEARCHR)		EXAMINER 2 (CHIEF EXAMINER FOR MUET)		PROFICIENT / LESS PROFICIENT PARTICIPANTS	WRITTEN TRANSCRIPTS (WT)	EXAMINER 1 RESEARCHR		EXAMINER 2 (CHIEF EXAMINER FOR MUET)	
		MARKS	BAND	MARKS	BAND			MARKS	BAND	MARKS	BAND
PROFICIENT (9 WT) Bands 4 and 5 Marks 37 – 49.	WT 1	49	5				WT 40	27	2	28	2
	WT 2	47	5				WT 41	28	2		
	WT 3	45	5				WT 42	28	2		
	WT 4	42	4				WT 43	28	2		
	WT 5	42	4				WT 44	27	2		
	WT 6	41	4				WT 45	27	2	27	2
	WT 7	41	4	35	3		WT 46	23	2	26	2
	WT 8	39	4				WT 47	26	2		
	WT 9	37	4				WT 48	26	2		
	WT 10	33	3	36	4		WT 49	26	2		
	WT 11	36	3				WT 50	26	2		
	WT 12	34	3	35	3		WT 51	26	2	28	3
	WT 13	35	3			LESS PROFICIENT (10 WT) Band 2 Marks 26 – 24	WT 52	26	2		
	WT 14	35	3				WT 53	26	2		
	WT 15	31	3	33	3		WT 54	26	2		
	WT 16	33	3	33	3		WT 55	26	2		
	WT 17	33	3				WT 56	25	2		
	WT 18	32	3				WT 57	25	2		
	WT 19	32	3				WT 58	25	2		
	WT 20	32	3				WT 59	25	2		
	WT 21	32	3	32	3		WT 60	24	2		
	WT 22	32	3	32	3	WRITTEN TRANSCRIPTS WITH MERE 'REPETITION OF TITLE' AND LIMITED WORD COUNT – INSUFFICIENT DATA TO ANALYSE	WT 61	24	2		
	WT 23	30	3	32	3		WT 62	24	2		
	WT 24	31	3				WT 63	24	2		
	WT 25	31	3				WT 64	22	2	23	2
	WT 26	31	3	31	3		WT 65	23	2		
	WT 27	31	3				WT 66	23	2		
	WT 28	25	2	30	3		WT 67	23	2		
	WT 29	30	3				WT 68	23	2		
	WT 30	30	3				WT 69	23	2		
	WT 31	30	3				WT 70	23	2		
	WT 32	31	3				WT 71	23	2		
	WT 33	30	3				WT 72	23	2		
	WT 34	30	3				WT 73	22	2		
	WT 35	30	3				WT 74	21	2	21	2
	WT 36	30	3				WT 75	18	1	20	1
	WT 37	29	3				WT 76	21	2	19	1
	WT 38	29	3				WT 77	16	1		
	WT 39	29	3				WT 78	10	1		

After the written transcripts had been marked and selected based on proficient participants and less proficient participants, the selected written transcripts were scanned and imported into Nvivo 10, a computer data analysis software. The data was analysed based on two coding schemes. The first coding scheme for Newman et. al. (1995), content analysis framework. This content analysis framework was used to analyse the critical thinking features detected in each of the proficient and less proficient transcripts. The second coding scheme was derived from Halliday and Hasan (1976) taxonomy of lexical cohesion.

Halliday and Hasan (1976) classification of lexical cohesion includes the two categories, *i.e. reiteration and collocation*. *Reiteration* was subdivided into four categories, *i.e. repetition, synonym or near-synonym, superordinate word and general word* whereas *collocation* was subdivided into six categories *i.e. association with a particular topic, opposition or contrast, membership in ordered sets, membership in unordered sets, low frequency words and co-occurrence of individual words* as seen in Table 3.2

Table 3.2: Adaptation of Halliday and Hasan’s Framework for Lexical Cohesion

Adaptation of Halliday and Hasan’s Framework for Lexical Cohesion Types and Categories of Lexical Cohesion	
	Reiteration
1	Repetition (<i>power/power</i>)
2	Synonym or near-synonym (<i>lack of order/chaos</i>)
3	Superordinate word (<i>environment / trees</i>)
4	General word (<i>this society</i>)
	Collocation
1	Association with a particular topic (<i>pollution, rubbish, waste, recycle,)</i>
2	Opposition or contrast (<i>inefficiency / efficiency</i>)
3	Membership in ordered sets (<i>days of the week</i>)
4	Membership in unordered sets (<i>names of colours</i>)
5	Low frequency words
6.	Co-occurrence of individual words (language / text / physical proximity in the text)

Both Newman et. al. (1995) content analysis framework and Halliday and Hasan (1976) taxonomy of lexical cohesion were adopted as the coding scheme to reveal the features of critical thinking and frequency of each type of lexical cohesive device found in each of the nine proficient and ten less proficient written transcripts. The Halliday and Hasan (1976) taxonomy of lexical cohesion and Newman et. al. (1995) content analysis framework is shown in the later part of Chapter 3. Quantitative analysis then was utilized to answer research question 1 and 2 respectively.

To answer research question 1, quantitative content analysis was used to find the frequency of each lexical cohesive device used by the participants in the 19 written transcripts. Newman et. al. (1995) content analysis scheme allows critical thinking to be quantified into percentage and ratio units. Being able to quantify critical thinking aids educators or researchers who wish to assess their students' critical thinking performance. This is because numerical values obtained could be used as learning evidence that can inform both 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 because this framework provided an explicit list of positive and negative critical thinking indicators. On the other hand, to answer research question three which aims to discover the relationship between critical thinking performance and lexical cohesion.

In a proficient and less proficient students' academic writing, a qualitative inductive approach is adopted. Using the inductive approach, the researcher studied the concordance lines for the most frequently used reiteration and collocation as identified by Halliday and Hasan (1976) and review the related critical thinking indicators found in the same sections for both proficient and less proficient students.

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

3.4.2 Instrumentation

The instruments used in the research will be discussed in the following sections.

3.4.2.1 Selection of Title

One title that was relevant to the academic writing task was given to the participants and the topic was in line with the themes that were tested for the actual MUET exam. The purpose of this title selection was to support the findings of this study which is the critical thinking ability of Sixth formers by their choice of lexicon used in their writing in relation to lexical cohesion. The title of the writing task given was *“The imbalance between the number of boys and girls pursuing university education creates social problems. To what extent is this statement true? Discuss.”* The participants were required to write their writing task in more than three hundred and fifty words as required by the MUET exam.

3.4.2.2 Interview questionnaire

A semi structured interview was designed to interview MUET teachers of government schools who are also examiners of the MUET examination. The purpose of this interview was to gain in depth understanding on the interviewees thoughts and opinions regarding the importance of critical thinking and lexical cohesion in writing

3.4.3 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 explained, followed by the description of the coding system adopted to analyse 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 content of communication” (p. 18). When the context of the written transcripts 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 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 utilized 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 & Wildermuth, 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 analyzing their data.

In order to answer the three research questions, the study adopted content analysis, 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 content sensitive and able to cope with a larger quantity of data and it examines the artifact (e.g. text, images) of communication itself and not the individual directly. For this study, both quantitative and qualitative content analysis methods are used to analyse the data collected. In order to answer

research questions one and two, quantitative content analysis will be used. This is because both research questions concern about obtaining numerical values. On the other hand, 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 and uncover underlying meaning from the data.

Since the study used Nvivo 10 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 10. Specific focus will be put on the functions of those features used for this study. The features include the modes and query. There are many functions under the query feature. For this study, the researcher used the matrix coding, text search, word frequency and coding comparison queries under the query feature.

3.4.3.1 Nvivo 10 Software used to carry out Content Analysis.

Nvivo 10 is a computer assisted qualitative data analysis software and it enables quantitative and qualitative content analysis to be carried out. The nine proficient written transcripts and 10 less proficient written transcripts were scanned into a PDF format and imported to the software. Coding schemes were also set up using the Nodes function of the software. According to the definition given by Nvivo 10 online manual, a node is defined as “a collection of references about a specific theme, place, person or other areas of interest.” The references come from the content of data coded at a node. The researcher of this study used the query feature provided by Nvivo 10 to analyse the data.

3.4.3.2 Halliday and Hasan Lexical Cohesion Framework

For research question 1, Halliday and Hasan's (1976) taxonomy of lexical cohesion was used as the data analysis framework because it is claimed by many as the most comprehensive framework available to date to study lexical cohesive devices which contribute cohesion in a text (Xi, 2010). The taxonomy of lexical cohesion created by Halliday and Hasan (1976) was adopted as the coding scheme. This study would focus on the two categories of lexical cohesion that is *reiteration* and *collocation* which make up lexical cohesion. This is because lexical cohesion is the interest of this study. Each of these categories of *reiteration* and *collocation* is further subdivided into several categories. The complete description of the two categories of lexical cohesion is available in Chapter 2. Halliday and Hasan's (1976) taxonomy of Lexical Cohesion will be presented in the next page.

Table 3.3: Halliday and Hasan (1976) Taxonomy of Lexical Cohesion

Adaptation of Halliday and Hasan's Framework for Cohesion Types and Categories of Lexical Cohesion in Cohesion (SAMPLE __)				
Reiteration	Proficient Students		Less Proficient Students	
	Frequency	%	Frequency	%
Repetition				
Synonym or near-synonym				
Superordinate word				
General word				
TOTAL				
Collocation	Proficient		Less Proficient	
	Frequency	%	Frequency	%
Association with a particular topic				
Opposition or contrast				
Membership in ordered sets				
Membership in unordered sets				
Low frequency words				
Co-occurrence of individual words				
Total				

Since the third research question concerns the evaluation of critical thinking found in the data using Newman, Webb and Cochrane (1995) content analysis scheme, the following section will present the information pertaining this content analysis scheme.

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

In order to answer research question two, the Newman, Webb and Cochrane quantitative content analysis scheme (1995) was the instrument used by the researcher to analyse the data. The content analysis method was designed to assess the nineteen written transcripts in terms of critical thinking characteristics it displays. Newman, Webb and Cochrane (1995) were concerned with tracing features of critical thinking in the nineteen written transcripts. They focused on evaluating critical thinking in computer mediated discussions and debates carried out by groups.

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 the 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. The mathematical formula is $X+ -X / X+ (+) -X$, where $X+$ refers to the total number of coded statements under the positive indicator while $X-$ refers to the total number of coded statements under the 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 ($R+0$) 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 detailed coding scheme of Newman, Webb and Cochrane (1995) is presented in Table 3.4.

Table 3.4: The Newman, Webb and Cochrane (1995) Content Analysis Framework

Newman, Webb and Cocharane's critical thinking indicators (adopted 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/issues	
N± Novelty; new info, ideas, solutions	NP+ New problem-related information	NP- Repeating what has been said	
	NL+ New ideas for discussion	NI- False or trivial leads	
	NS+ New solutions to problems	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 knowledge or experience to bear on problem	OE+ Drawing on personal	OQ- Squashing attempts to bring experience 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 lectures and texts)		
A± Ambiguities: Clarified or confused	OQ+ Welcoming outside knowledge	AC- Confused statements	
		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 justification	
	JS+ Discussing advantages and Disadvantages of solution	JS- Offering several solutions without suggesting which is the most appropriate	
C± Critical assessment	C+ Critical assessment or evaluation of own or others' contributions	Investigating students' critical thinking	
	CT+ Tutor prompts for critical evaluation	C- Uncritical acceptance or unreasoned rejection	
P± Practical utility (grounding)		CT- Tutor uncritically accepts	
	P+ Relate possible solutions to familiar situations; Discuss practical utility of new ideas	P- Discuss in a vacuum (treat as if on Mars); Suggest impractical solutions	
W± Width of understanding. Complete picture	Widen discussion (problem within a larger perspective. Intervention strategies within a wider framework.)	Narrow discussion. (Address bits or fragments of situation. Suggest glib, partial, interventions)	

Multiple codes can be applied to an instance if it shows the presence of more than one characteristics of critical thinking. Furthermore, the indicators do not attempt to evaluate the depth of these cognitive skills but to identify critical and uncritical statements. These statements may be phrases, sentences, paragraphs or messages containing one unit of meaning, illustrating at least one of the indicators. Of course, one statement might show more than one indicator, such as presenting a new idea which widens the discussion but to ensure capability indiscrimination, each

indicator was referred to only one aspect of critical thinking process and no two indicators were referred to the same aspect of critical thinking (Newman et. al. (1995). Newman, Webb and Cochrane (1995) also stated that

“Rather than classify every statement in a transcript as e.g. critical assessment or uncritical acceptance, we mark and count the obvious example, 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 was easier for the coders and it also helped the coders to obtain a satisfactory interrater reliability reading. This is because by taking into account only the obvious examples and this helps in reducing the disagreement among the coders when it comes to the coding decision of the same content of the online transcripts based on Newman, Webb and Cochrane (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 idea of the categories of the coding scheme (Y. Zhang & Wildemuth, 2009). In addition, Marra, Moore and Klimezak (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 the interrater reliability impossible. For this research, thematic lexicon and phrases related to theme of the title of the written transcripts of academic writing by the participants, were identified as the unit of analysis when the researcher

and another independent coder coded the data based on Newman, Webb and Cochrane (1995) content analysis scheme.

The fact that the thematic lexicon and phrases are easily identifiable is the reason why the researcher of this study chose both the thematic lexicon and phrases as the unit of analysis, in fact, since 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).

3.5 Interrater reliability

Obtaining the reading of interrater reliability is widely recognized as an essential step to be carried out by content analysts. The importance of obtaining interrater reliability is reflected when Neuendorf (2002) wrote, “given a goal for content analysis is to identify and record relatively (or at least subjective) 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 raters evaluate a characteristic of a message or artifact and reach the same conclusion.”

For this study, there were two raters rating the samples of writing by the participants, known as examiner 1 (the researcher) and examiner 2, a fellow chief examiner for the standardized public exam (MUET). For the interrater reliability reading, the second rater (examiner 2) rated 20% of the overall data as shown in Table 3.1

The researcher grouped the samples of writing into two categories namely, the proficient students and less proficient students based on the ratings given by the two raters. The data was then run using Coding Comparison Query found in Nvivo 10 to obtain values for lexical cohesion,

using Halliday and Hasan's framework (1976) that has 9 nodes and Newman, Webb and Cochrane's framework (1995) for critical thinking that has 45 nodes. The result produced by Coding Comparison Query was then exported to Microsoft Excel 2010, where the overall frequency of lexical cohesion and critical thinking was used by the proficient and less proficient students. The quantitative content analysis results were obtained to answer research questions 1 and 2. In order to answer research question 3, word frequency query function of Nvivo 10 was used to find out the most frequently used lexical cohesion in proficient and less proficient students. Based on the results, it showed that reiteration had the highest frequency of 1172 instances for less proficient students and collocation had the highest frequency of 234 instances for proficient participants.

To answer research question 4, the interview transcripts were analysed to discover perceptions of instructors / teachers regarding the importance of lexical cohesion and critical thinking in academic writing.

3.6 Conclusion

This chapter outlined the information regarding the methodology adopted by the researcher for this study. This chapter gave the account of the research design, participants and data collection procedure. The next chapter will present the results and discussion of the results.

CHAPTER 4: FINDINGS AND DISCUSSION

4.1 Introduction

In the preceding chapter, the research design used in the study was explained in detail. This included the qualitative data collection involving 9 written transcripts of proficient participants and 10 written transcripts of less proficient students and the quantitative and qualitative data analysis methods 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 lexical cohesion found via the use of in the Matrix coding function of Nvivo 10, which will answer the first research question: What is the percentage of reiteration and collocation found in proficient and less proficient students' writing? The next section will address the second research question: What is the critical thinking ratio in proficient and less proficient students' writing? In order to answer this research question, the researcher will present the results of critical thinking ratio based on Newman et. al (1995) content analysis scheme. The third research question: What is the relationship between critical thinking performance and lexical cohesion in proficient and less proficient students' academic writing? This will be addressed by comparing the result of the first question i.e. the percentage of lexical cohesion used in the transcripts written by 9 proficient and 10 less proficient participants and the ratio of critical thinking indicators obtained from the transcripts written by these 9 proficient and 10 less proficient participants. The examples for critical thinking and lexical cohesion are presented in Figures 4.1 and 4.2. Finally, to answer the fourth research question: How do instructors view lexical cohesion and critical thinking. The interview transcripts are analysed to trace the relevant content which relate to how instructors view lexical cohesion and critical

thinking. The following section will present findings and discussion of the percentage of reiteration and collocation found in proficient and less proficient students' writing?

4.2 Research Question 1

What is the frequency and percentage of reiteration and collocation found in proficient and less proficient students' writing?

To answer the first research question, the percentage of reiteration and collocation found in the writing of proficient and less proficient students', the frequency of occurrence of the sub categories of *reiteration* and *collocation* was calculated and presented in percentage. Halliday and Hasan (1976) classified lexical cohesion into two categories, i.e. *reiteration* and *collocation*. **Reiteration** was subdivided into four categories, i.e. *repetition*, *synonym or near-synonym*, *superordinate word* and *general word* whereas **collocation** was subdivided into six categories i.e. *association with a particular topic*, *opposition or contrast*, *membership in ordered sets*, *membership in unordered sets*, *low frequency words* and *co-occurrence of individual words*. The following section will explain the frequency and percentage of lexical cohesion: **Reiteration** and **Collocation** found in proficient and less proficient students' writing.

Table 4.1: Frequency and percentage of Lexical cohesion: *Reiteration* and *Collocation* found in Proficient and Less Proficient students' writing.

Lexical Cohesion	Proficient Students		Less Proficient Students	
	Frequency	%	Frequency	%
<i>Reiteration</i>	1040	22.14%	1172	29.73%
<i>Collocation</i>	234	4.98%	94	2.38%
TOTAL		27.12%		32.11%

Reiteration is the most frequent type among the two types of lexical cohesion which appears 1040 times or 22.14% in proficient students writing and 1172 times or 29.73% in less

proficient students' writing. It is evident that the use of *reiteration* is lower in proficient students compared to less proficient students. This seems to suggest that the proficient students utilized less *reiteration* as they use more collocation to express their ideas.

The second is *collocation* which appears 234 times or 4.98 % in proficient students writing and 94 times or 2.38% in less proficient students' writing. It is clearly seen that the use of *collocation* is higher in proficient students' writing than in less proficient students writing.

Based on the writing by proficient and less proficient students the total percentage of lexical cohesiveness for the proficient students' is 27.12% and less proficient students is 32.11%. It seems both groups of students do produce writing that contains lexical cohesion, that is *reiteration* and *collocation*. This is supported by two researchers who claim that lexical cohesion is the most common category in both good and weak essays, and that 'highly rated' essays contain more lexical *collocations* than 'low-rated' essays (Johns, 1980; Zhang, 2000). This finding by Johns (1980) and Zhang (2000) also stated that the use of *collocation* is higher in the written discourse of proficient students'. In the context of this study, proficient students used more *collocation*.

In the next section, the detailed findings and discussion of the findings regarding lexical cohesion related to reiteration will be presented in accordance with the sub categories of *reiteration*, namely *repetition*, *synonym or near-synonym*, *superordinate word* and *general word*. The findings will include the frequency and percentage for each sub category subsumed under lexical cohesion.

4.2.1 Reiteration

According to Halliday and Hasan's taxonomy of Lexical Cohesion (1976), reiteration is further divided into four sub categories namely *repetition*, *synonym or near-synonym*, *superordinate word* and *general word*. The total frequency and percentage for each sub category found in the data of the proficient and less proficient students' writing is presented in Table 4.2 below.

Table 4.2: Frequency and percentage of Reiteration found in Proficient and Less Proficient students' writing.

Reiteration	Proficient Students		Less Proficient Students	
	Frequency	%	Frequency	%
Repetition	948	20.18%	1098	27.85%
Synonym or near-synonym	28	0.60%	15	0.38%
Superordinate word	44	0.94%	49	1.24%
General word	20	0.43%	10	0.25%
TOTAL	1040	22.14%	1172	29.73%

According to the result displayed in Table 4.2, it is apparent that *repetition* is the most frequently used by both the proficient and less proficient participants of this study, followed by the use of the superordinate word. The third most frequently use is the synonym or near synonym followed by the least used type of reiteration is the general word.

It seems that less proficient students use of more *repetition* in their writing compared to proficient students' writing (1098 compared to 948). In addition, proficient students clearly use more *synonym / near-synonym* compared to less proficient students Table 4.2 shows that proficient students frequency of synonyms is 28 and only 15 for less proficient students. Almost the same number of *super-ordinates* were used as shown in Table 4.2, whereby it is 44 for proficient students and for less proficient students it is 49. There seems to be a difference in terms of *general word*

for proficient and less proficient students. The frequency for proficient students is 20 which is double the amount for less proficient students.

In the next section, the detailed findings and discussion for lexical cohesion related to collocation will be presented in accordance with the six sub categories of *collocation*, namely *association with a particular topic*, *opposition or contrast*, *membership in ordered sets*, *membership in unordered sets*, *low frequency words* and *co-occurrence of individual words*. The findings will include the frequency and percentage for each sub category subsumed under *collocation*.

4.2.2 Collocation

According to Halliday and Hasan's taxonomy of Lexical Cohesion (1976), collocation is further divided into six sub categories namely *association with a particular topic*, *opposition or contrast*, *membership in ordered sets*, *membership in unordered sets*, *low frequency words* and *co-occurrence of individual words*. The total frequency and percentage for each sub category of collocation in the proficient and less proficient students' writing is presented in Table 4.3 below.

Table 4.3: Total Frequency and percentage of Collocation found in Proficient and Less Proficient students' writing

Collocation	Proficient			Less Proficient		
	Frequency	Eg	%	Frequency	Eg	%
Association with a particular topic	16		0.34%	15		0.38%
Opposition or contrast	34		0.72%	20		0.51%
Membership in ordered sets	0		0.00%	0		0.00%
Membership in unordered sets	0		0.00%	0		0.00%
Low frequency words	9		0.19%	2		0.05%
Co-occurrence of individual words	175		3.72%	57		1.45%
Total	234	102	4.98%	94	43	2.38%

Table 4.3 presents in detail the total frequency and percentage of *collocation* and its six sub categories found in nine proficient and nine less proficient students' writing. The data of this

study clearly shows that examples for *membership in ordered sets* and *membership in unordered sets* were not found. The reason being that the title of the argumentative writing being “*The imbalance between the number of boys and girls pursuing university education creates social problems.*” did not relate to these two sub categories of collocation.

In addition, the overall use of *collocation* is higher for proficient students, 234 words used in 102 examples, is 4.98%, while for less proficient students, where the total number of words used in this category was only 94 words used in only 43 examples with a total percentage of 2.38%.

This restricted use of collocation is supported by the claim by (Halliday & Hasan, 1976: p.284) that the most complicated part of lexical cohesion is *collocation*; i.e. cohesion "achieved through the associations of lexical items that regularly co-occur." as lexico-semantic co-occurrence can be provided by opposite (antonymy) relations, part of whole or part of part relations, and by hyponymy between lexical items. All these patterns constitute *collocations*. Nakhimovsky and Leed (1979) justify that *collocations* are difficult to produce for second language learners where learners normally use to translate word-for-word in their first language. For example, in translating word-for-word the expression: ‘to open the door’, the co-occurrence of ‘door’ and ‘open’ are free combinations. If a learner combines ‘door’ and ‘break down’ or combines ‘door’ and ‘force’, they are deemed *collocation*.

Producing *collocations* like ‘to break down the door’ and ‘to force the door’ does not link with meaning of ‘to open the door’. Such absurd *collocations* tend to be produced by learners’ of English because they are not aware of the construct.

In the next section, details regarding the vocabulary related to *reiteration* and *collocation* will be presented to show the different use by proficient and less proficient students.

4.2.3 Examples of Reiteration extracted from Proficient Students' and Less Proficient Students Writing

To calculate the lexical density of the language being used, the simplest measure of lexical density, as defined by Halliday (1985), is the 'the number of lexical items (content words) which relate to the theme and topic of the text'. Based on this definition, content words that fall into the four sub categories of reiteration namely '*repetition*', '*synonym*' or '*near-synonym*', '*superordinate word*' and '*general word*' were identified and tabulated in Nvivo 10. The following section will present extracts of *reiteration* based on their sub categories from the writings of proficient students and less proficient students.

4.2.3.1 The Use of Repetition

Example 4.2.3.1.1 (Extracted from Proficient Students' Writing Sample 1)

.....it also at the same time resulted a phenomenon where **highly educated women** inclined to marriage late in life or remain single. Consequences that we possible observe in the near future is that, **population** ages faster and growth rate of **population** remain stagnant because rate of reproduction is directly dependent in female gender.Therefore, if **women are highly educated** is associated slower **population** growth.....

Example 4.2.3.1.2 (Extracted from Less Proficient Students' Writing Sample 60)

The problem is to get a great **leader** in university, women is not suitable to be a **leader** because when everyone want to be a **leader**, but they not suitable to be a **leader**.

Discussion

With reference to both the examples above, use of *repetition* by proficient and less proficient students is presented in *Example 4.2.3.1.1* uses the repetition of 'women' which shows

logical linkage, whereas *Example 4.2.3.1.2* shows the word ‘leader’ repeated in the same word form, four times in the same sentence but does not relate to ‘women’ in a logical way.

This example is supported by the fact that less proficient students tend to use a greater *repetition* of words and (McNamara et al., 2010) and have greater word overlap between sentences (McNamara et al., 2013). This affects the quality of the text because the less proficient student lacks in linguistic style (Crossley, Roscoe, & McNamara, 2014) unlike a proficient writer who elaborates on a topic or argument using explicit cohesion devices link the ideas in the text together (King & Rentel, 1979).

4.2.3.2 The Use of General Word

Example 4.2.3.4.1 (Extracted from Proficient Students’ Writing Sample 4)

The population indeed will creates social problems to today’s society.

Example 4.2.3.4.2 (Extracted from Less Proficient Students’ Writing Sample 60)

This is why to make a great man must have the trainer, the trainer is the environment and society.

Discussion

Both the examples above are related to the use of *general word* by proficient and less proficient students in two examples, that is *Example 4.2.3.4.1* and *Example 4.2.3.4.2* which show the use of the *general word* ‘society’. However, the example by the less proficient student has affected the writing quality (McNamara et al., 2013) and cohesiveness of the text. The reason being ‘trainer’ is illogically linked to ‘environment’ and ‘society’.

4.2.4 Examples of Collocation extracted from Proficient Students’ and Less Proficient Students’ Writing

4.2.4.1 Association with a particular topic

Example 4.2.4.1.1 (Extracted from Proficient Students’ Writing Sample 2)

*They will not involve in a bad activities, for example **murder, rape or steal** and many social problems.*

Example 4.2.4.1.2 (Extracted from Less Proficient Students' Writing Sample 55)

The differences will create many social problems such as vandalism and gangsterism bullying lecturer and also can build a group study between mixed boys and girls.

Discussion

Similarly, it is evident that the less proficient students' lexical choice to link 'social problems' 'bullying lecturer' and 'group study' seemed to make no sense at all, in comparison to a proficient student who links '**murder, rape or steal**' to '*bad activities*'. The cohesive devices used by the less proficient student is irrelevant and does not aid the reader in understanding the topic or argument of the essay (King & Rentel, 1979).

4.2.4.2 The Use of Opposition or Contrast

Example 4.2.4.2.1 (Extracted from Proficient Students' Writing Sample 2)

*Therefore, gender is not a problem as bad activities can happen to both boys and girls, as it depends on their personalities, either on a **positive or negative side**.*

Example 4.2.4.2.2 (Extracted from Less Proficient Students' Writing Sample 56)

*When **girls is more than boys**, girls also will fight and they usually fight for a long time.*

Discussion

It can be seen that the ability to use collocations of *opposition or contrast*, the less proficient students failed to compare 'boys and girls', which are the context words effectively and convincingly, unlike the proficient student who was able to use the collocation '*a positive or negative side*' appropriately. The cohesive devices used by the less proficient student does not

contribute to the clarity of the essay and does not aid the reader in understanding the topic or argument of the essay (King & Rentel, 1979) in comparison to the proficient student who has used the cohesive device ‘collocation’ aptly to show *opposition and contrast*.

4.2.4.3 Co-Occurrence of Individual Words

Example 4.2.4.6.1 (Extracted from Proficient Students’ Writing Sample 1)

*In developing country Malaysia, there is still need of younger generation that could become **pillar of development in the future**.*

Example 4.2.4.6.2 (Extracted from Less Proficient Students’ Writing Sample 54)

*In Malaysia, it would be boring if only boys or only girls **burn the midnight oil** with a very few friends among themselves.*

Discussion

With reference to both the examples of the sub categories of collocation namely *co-occurrence of individual words*, the proficient stu has used ‘**pillar of development**’ aptly contributing to clarity of idea (King & Rentel, 1979) whereas and less proficient student has used ‘**burn the midnight oil**’ inaptly in the examples above.

Being the main carrier of message and the means of expression, lexical items are the principal components of any composition. However, because lexicon involves both meaning and usage, it becomes a much more complicated and difficult for ESL learners’. The analysis of the written discourse of proficient and less proficient students in this study indicates that less proficient students tend to wrongly use collocations due to the restricted choice of lexical choices.

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

4.3 Research Question 2

What is the critical thinking ratio in a proficient and less proficient students' writing?

Newman, Web and Cochrane (1995) content analysis scheme which has been widely used to assess critical thinking found in online discussions, debates, weblogs and threaded discussions. Thus, it has been adapted to analyse the content for features of critical thinking in proficient and less proficient students' writing in this study. As aforementioned, Newman, Web and Cochrane (1995) identified 45 indicators of positive and negative critical thinking indicators. These 45 indicators of positive and negative critical thinking 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 ten broad categories known as O_{\pm} (*Bringing outside knowledge or experience to bear on problem*) consists six positive critical thinking indicators namely, $OE+$ (*Drawing on personal experience*), $OC+$ (*Refer to course material*), $OM+$ (*Use relevant outside material*), $OK+$ (*Using previous knowledge*), $OP+$ (*Course-related problems brought in e.g., students identify problems from lectures and texts*) and $OQ+$ (*Welcoming outside knowledge*), and the negative critical thinking sub category $O-$ which is again sub divided into another two different $O-$ indicators which are known as $OQ-$ (*Squashing attempts to bring experience 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 indicators will be added up and the total amount of the scores will be reported under the category of positive critical thinking O_{\pm} (*Bringing outside knowledge or experience to bear on problem*). The same method is used for the $O-$ (*Sticking to prejudice or assumptions*) 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 scores for O_{\pm} (*Bringing outside*

knowledge or experience to bear on problem) positive critical thinking category of the proficient and less proficient students' writing are presented in Table 4.4 below.

Table 4.4: Frequency and Ratio of Critical Thinking (O_{\pm}) found in Proficient and Less

Proficient students' writing.

Critical Thinking Category-Bringing outside knowledge or experience to bear on problem		Proficient Students		Less Proficient Students	
		Total	Frequency	Total	Frequency
OE+	OE+ Drawing on personal experience	3	3	0	0
OC+	OC+ Refer to course material	0	0	0	0
OM+	OM+ Use relevant outside material	0	0	0	0
OK+	OK+ Using previous knowledge	0	0	8	8
OP+	OP+ Course-related problems brought	0	0	0	0
OQ+	OQ+ Welcoming outside knowledge	0	0	0	0
OQ-	OQ- Squashing attempts to bring experience in outside knowledge	0	0	0	0
O-	O- Sticking to prejudice or assumptions	-33	33	-70	70
	Total	-30	36	-62	78
	Ratio	-0.83		-0.79	

Discussion

Referring to Table 4.4, after adding up all the scores for each O_{+} sub categories, the overall score is quite similar for proficient and less proficient students. The method used to report the overall score of both O_{+} (*Bringing outside knowledge or experience to bear on problem*) and O_{-} (*Sticking to prejudice or assumptions*) categories will be applied to the rest of the positive and negative indicator sub categories.

In this study, the researcher shows the frequency and percentage for each of the positive and negative critical thinking indicator categories and present results in a table form. In addition, the critical thinking ratio will also be calculated based on the formula provided by Newman, Webb

and Cochrane (1995) and the results are then tabulated. The mathematical formula provided by Newman, Webb and Cochrane (1995) was explained earlier in Chapter 2. The coding procedure was applied when coding all the writing samples of the proficient and less proficient students writing. With the adaptation of Newman, Webb and Cochrane's (1995) framework for critical thinking, the written samples of proficient and less proficient students were analysed and the critical thinking ratio for the ten broad categories will be presented in Table 4.5.

Table 4.5: Frequency and Ratio of Critical Thinking found in Proficient and Less

Proficient students' writing

Critical Thinking Categories		Proficient Students		Less Proficient Students	
		Total	Frequency	Total	Frequency
1.	Relevance				
R+	Relevant statements	+120	120	45	45
R-	Irrelevant statements, diversions	-51	51	-122	122
	Total	+69	171	-77	167
	Ratio	0.40		-0.46	
2.	Importance				
I+	Important points/issues	45	45	0	0
I-	Unimportant, trivial points/issues	-13	13	-37	37
	Total	32	58	-37	37
	Ratio	0.55		-1.00	
3.	Novelty; new info, ideas, solutions				
NP+	New problem-related information	41	41	9	9
NP-	Repeating what has been said	0	0	0	0
NI+	New ideas for discussion	41	41	9	9
NI-	False or trivial leads	-1	1	-39	39
NS+	New solutions to problems	5	5	4	4
NS-	Accepting first offered solution	0	0	0	0
NQ+	Welcoming new ideas	0	0	0	0
NQ-	Squashing, putting down new ideas	0	0	0	0
NL+	Learner brings new things in	0	0	0	0
NL-	dragged by tutor	0	0	0	0
	Total	86	88	-17	61
	Ratio	0.98		-0.28	
4.	Bringing outside knowledge or experience to bear on problem				
OE+	Drawing on personal experience	3	3	0	0
OC+	Refer to course material	0	0	0	0
OM+	Use relevant outside material	0	0	0	0
OK+	Using previous knowledge	0	0	8	8
OP+	Course-related problems brought	0	0	0	0
OQ+	Welcoming outside knowledge	0	0	0	0

OQ-	Squashing attempts to bring experience in outside knowledge	0	0	0	0
O-	Sticking to prejudice or assumptions	-33	33	-70	70
	Total	-30	36	-62	78
	Ratio	-0.83		-0.79	
5.	Ambiguities: Clarified or confused				
AC+	Clear, unambiguous statements	38	38	12	12
AC-	Confused statements	-36	36	-46	46
A+	Discuss ambiguities to clear them up	77	77	32	32
A-	Continue to ignore ambiguities	-25	25	-41	41
	Total	54	176	-43	131
	Ratio	0.31		-0.33	
6.	Linking ideas, interpretation				
L+	Linking facts, ideas and notions	100	100	35	35
L-	Repeating information without making inferences or offering an interpretation	-45	45	-97	97
	Total	55	145	-62	132
	Ratio	0.38		-0.47	
7.	Justification				
JP+	Providing proof or examples	76	76	31	31
JS+	Justifying solutions or judgments	31	31	4	4
JP-	JP-Irrelevant or obscuring questions or examples	-26	26	-54	54
JS-	JS- Offering judgments or solutions without explanations or justification; Offering several solutions without suggesting which is the most appropriate.	-4	4	-12	12
	Total	77	137	-31	101
	Ratio	0.56		-0.31	
8.	Critical assessment				
C+	Critical assessment or evaluation of own or others' contributions	0	0	0	0
CT+	Tutor prompts for critical evaluation	0	0	0	0
C-	Uncritical acceptance or unreasoned rejection	0	0	0	0
CT-	Tutor uncritically accepts	0	0	0	0
	Total	0	0	0	0
	Ratio	0.0		0.0	
9.	Practical utility (grounding)				
P+	Relate possible solutions to familiar situations; Discuss practical utility of new ideas	5	5	0	0
P-	Discuss in a vacuum (treat as if on Mars); Suggest impractical solutions	-2	2	-15	15
	Total	3	7	-15	15
	Ratio	0.43		-1.00	
10.	Width of understanding. Complete picture				
W+	Widen discussion (problem within a larger perspective. Intervention strategies within a wider framework.)	5	5	0	0
W-	Narrow discussion. (Address bits or fragments of situation. Suggest glib, partial, interventions)	-1	1	-3	3
	Total	4	6	-3	3
	Ratio	0.67		-1.00	

Table 4.5: Frequency and Ratio of Critical Thinking found in Proficient and Less

Proficient students' writing (continued)

Discussion

It can be seen that except for '*Bringing outside knowledge or experience*' to bear on problem, there are more positive critical thinking features in proficient students' writing compared to less proficient students.

4.4 Research Question 3

What is the relationship between critical thinking performance and lexical cohesion in proficient and less proficient students' academic writing?

As aforementioned, according to Halliday and Hasan theory on lexical cohesion. there are two categories namely *reiteration* and *collocation* which can be employed to create cohesion within a text. The researcher will locate the *reiteration* and *collocation* pairs with the intention of identifying critical thinking features found in parts written by proficient students and less proficient students.

Table 4.6: Comparison Lexical Cohesion and Critical Thinking Results

	Lexical Cohesion		Positive Critical Thinking Indicators									
	REITERATION	COLLOCATION	R+	I+	N+	O+	A+	L+	J+	C+	P+	W+
Proficient Students	22.14%	4.98 %	+0.40	+0.55	+0.98	-0.83	+0.31	+0.38	+0.56	0	+0.43	+0.67
Less Proficient Students	29.73%	2.38%	-0.46	-1.00	-0.28	-0.79	-0.33	-0.47	-0.31	0	-1.00	-1.00

Discussion

The most frequently used lexical cohesion in this study is *reiteration* followed by *collocation*. Although Witte's and Faigley (1981) have claimed that the role of lexical cohesion in writing quality is that the use of lexical cohesion is important but the lexical ties such as *repetition*

of the *same word*, *synonym*, *superordinate* and *general word*, be distributed to include all kinds of lexical ties. Simply said, having a high number of one lexical item will clearly affect the writing quality. As for this study, the use of *reiteration* was 22.14% for proficient students where 20.18% was *repetition* and 29.73% for less proficient students where 27.85% was *repetition*. These measurements are supported by the findings of Witte and Faigley (1981) in their research that “the majority of lexical ties (65%) in the ‘low essays’ are *repetitions* of the same word. If meaning is constructed by writing, the *repetitions* of the same word will bring about redundancy and hamper the meaning of the text. McGee (2009) examined only the type of *reiteration* by looking at its four sub-classes: *same item*, *synonym*, *super-ordinate*, and *general item*. McGee found that *reiteration* can lead to redundancy and hence weakens the writing quality. McGee’s finding is of great importance because the common belief tends to consider *reiteration* as an important component that enhances the writing quality. *Reiteration* was also examined in Reynolds (2001) in writing development where the findings showed that lexical *repetition* has the tendency to correlate with the length of the essay, where students feel the necessity of explaining the old information they already talked about instead of coming up with new lexicon. In terms of *collocation*, although the use of *collocation* in proficient students writing was 4.98% but it was definitely higher than the less proficient students’ writing which was 2.38%. This is also claimed by both Johns (1980) and Zhang (2000) that ‘highly scored’ essays include more lexical *collocations* than ‘low scored’ ones. Furthermore, J. R. Firth (1956) states that *collocations* depend greatly on the context to bring about deeper meaning. When a student uses either *collocations* or *reiterations* appropriately in a context the meaning has been established (Grabe, 2009) and deeply situated in context (Gee, 2000; 2001). Hence, writing involves relating meaning of words in the context in which it occurs (Johns, 1997; Langer, Bartolome, Vasque & Lucas, 1990; Ruddell & Unrau, 2004; Smagorisky, 2011; 2001;

Smith, 1985). In view of this, writing for meaning, by way of exercising one's critical thinking, is always tied to the role of language because the surface structure of language has meaning (Fariclough, 2001; Gee, 2001) but it is ambiguous (Smith, 1985) unless the function of language is about presenting information as facts (Gee, 2001). In short, *repetition* or redundancy do not bring about new information (McGree 2009), unlike the apt use of *collocation* is a central feature of a language production (Lewis 1997). In addition, the Oxford Collocation Dictionary (2002) also stresses the role of *collocation* in a language. They claim that every student choosing the right *collocation* makes his/her speech more natural and more native-speaker-like and more precise because the meaning of a word is always determined by the context and it is '*collocation*' that provides this context. This is supported by the fact that the theory in critical thinking defines that applying critical skills alone is insufficient to produce critical thinkers; but being able to use it various context such as in writing (Kamsiah, 2003; Stupnisky, Renaud, Daniels, Hayness, & Perry, 2008) is the heart of critical thinking (APA, 1990). As a result, the usage of *collocation* determines precision and pertinence of a text and enables students to produce texts which are authentic and similar to what a native speaker would use in a specific situation. (Lewis, 1997)

Since, human thinking or cognition is a storehouse of experience, these schemata instrumentally and directly influence the integration of the new experience, gained through our reading, listening, writing and oral activity, with the old information in our memory to give meaning to the words, phrases and sentences that are situated in actual contexts of their use (Gee, 2001; 2000).

To evaluate cognition which display in-depth processing (McKenzie & Murphy, 2000) and critical thinking (Liou, 2001; Newman, Johnson, Cochrane, & Webb, 1996; Newman, Webb, & Cochrane, 1995), Newman, Webb and Cochrane's (1995) framework was used to evaluate the

features of critical thinking displayed by the use of *collocation*. In the next section, the use of *collocation* to reflect critical thinking will be explained.

Figure 4.1: Examples of Lexical Cohesion and Critical Thinking used in Proficient Students' writing to indicate Positive or Negative thinking

EXAMPLE FROM PROFICIENT STUDENTS' WRITING

Well the imbalance between number of boys and girls in university seems to creates social problem but we also learn a undeniable fact that when more female genders are able to make it to university, it is also leads to more awareness of women right in majority of them Women may not considered inferior to man, therefore , enducated women are not subjected to domestic abuse and violence. Not only, the awareness will cultivated individually but whole female population could be benefit in so doing, social problem as long as domestic violence and abuse is concerned will be reduced.

COLLOCATION R+ AC+
COLLOCATION R+ AC+ NI+ COLLOCATION
R+ AC+ NS+ R+ AC+ NS+
COLLOCATION COLLOCATION
COLLOCATION R+ AC+ NS+ COLLOCATION
R+ AC+ W+

Figure 4.2: Examples of Lexical Cohesion and Critical Thinking used in Less Proficient Students' writing to indicate Positive or Negative thinking

EXAMPLE FROM LESS PROFICIENT STUDENTS' WRITING

Less discipline in ourselves can contribute to the social problems. Life in university teach us to

*^{REITERATION}
discipline boys and girls. We have to ^{R-AC-}our time rightly for study, ^{REITERATION} sports activities, ^{REITERATION} college activities*

and others. We like all this when we are ^{R-AC-}to our hometown. If cannot rightly ourself, it can make

^{R-AC-}ourself to do wrong thing. Example, ^{R-AC+}the boys like ^{COLLOCATION}illegal race when they cannot ^{REITERATION}discipline theirself

to go ^{R-W-}back early in home at night,

4.4.1 Examples of Lexical Cohesion and Critical Thinking used in Proficient Students' writing to indicate Positive or Negative thinking

Discussion

From Figures 4.1 and 4.2, it is evident that a proficient student uses more *collocations* than reiteration such as 'women right', 'domestic abuse', 'female population' and 'domestic violence' to express their viewpoints in their writing as compared to the less proficient student who has used only one collocation, 'illegal race'.

The use of *collocations* by proficient students is apt to the theme of the context, thus, contributing to the positive critical thinking, for example, the *collocation* 'women right' used in

'leads to more awareness in women right in majority of them' has been awarded *relevant statement (R+)*, *clear, unambiguous statements (AC+)* and *new ideas for discussion (NI+)*. However, the use of *collocation 'illegal race'* by the less proficient student to express that *'boys like illegal race'* is a *clear, unambiguous statement (AC+)*, a positive critical thinking indicator but because it is used inappropriately in context, *'boys like illegal race'* this sentence becomes *irrelevant (R-)* to the theme of the context, reflecting negative critical thinking. It is evident that *collocations* used in context contributes to better quality writing as J. R. Firth (1966) claimed that the use of *collocations* depend in their association on the 'context of a particular situation.' The following section will investigate teachers' perceptions on critical thinking and lexical cohesion.

4.5 Results and discussion of Research Question 4

The interview data (*Appendix D*) was analysed for its content and the following features were found to influence the teachers' perception.

4.5.1 Interview

In order to triangulate the findings of research question 1, research question 2, and research question 3, a semi-structured interview was carried out to explore teachers' views on critical thinking and lexical cohesion. Based on the interview that was carried out with five participants who volunteered. The interview was semi guided as the participants were unaware of the technical term 'lexical cohesion' but were familiar with the term 'critical thinking'. The participants as mentioned in chapter three, are all MUET teachers as well as examiners of the public MUET exam. The findings of the interviews are as follows:

4.5.1.1 Teachers perception of Lexical Cohesion in Writing

All the five respondents showed a lack of understanding when they related lexical cohesion to vocabulary used in a student's writing. The participants quoted examples such as *'range of*

words', *'use of words*', *'correct choice of words*' and *'words or vocabulary*' when they were asked to define lexical cohesion. During the interview, there was no mention of *'reiteration*', *'collocation*' or even *'low frequency words*', so it is evident that these features of lexical cohesion are not given due importance during teaching and learning of English in classrooms Waldemar Marton (1977) claims that *'mere exposure to the target language is not sufficient for learners to acquire the knowledge of collocations'*. He argues that if language teachers want to guide learners towards a native-like command of the foreign language, they *'should pay special attention to their effective learning of collocations'*.

4.5.1.2 Teachers perception of Critical Thinking in Writing

Four out of the five participants perception of critical thinking related to the following examples extracted from the interview transcripts, *'to express yourself* and *'to expand your thought*', *'critical thinking is to justify what you want to say*', *'elaborate with a lot more examples*', *'to clarify and words and statements*', and *'topic sentences which are supported with examples*'. It is evident that these participants were partially clear about the definition of critical thinking as Lauer (2005) who posits that teachers may not know how to identify critical thinking in their students' written work.

4.5.1.3 Teachers perception of evaluating Critical Thinking in Writing

Three participants claimed that evaluation of written assignments is more focused on clear and accurate language. For example, one respondent said that she looks for *'more correctness of the language.'* The second respondent said that she gives more focus to producing *'error free language'* while the other two respondents claimed if students could give *'sound logical information and ideas'* supported with *'substantial evidence, examples or conclusions'* then they are able to think critically. As noted by Ridell (2007) and Duron et al. (2006), critical thinking

involves higher level thinking skills and involves complex processing of information. It seems that these teachers' understanding of critical thinking is more inclined to the ability of students to use a variety of vocabulary to support their argument in their writing assignment which may not even contribute to clarification of an argument or topic.

4.6 Conclusion

The findings of the four research questions of this study have been discussed in detail and it is evident that the proficient students reflect their knowledge of collocations by using them appropriately in their writing which contributes to a higher ratio of positive critical thinking indicators as compared to the less proficient students who have a poor knowledge of collocation which used incorrectly in context gives rise to negative critical thinking indicators. These findings are triangulated with responses from instructors / teachers who show partial understanding of features of critical thinking and the use of lexical cohesion in writing.

CHAPTER 5: CONCLUSION AND IMPLICATIONS

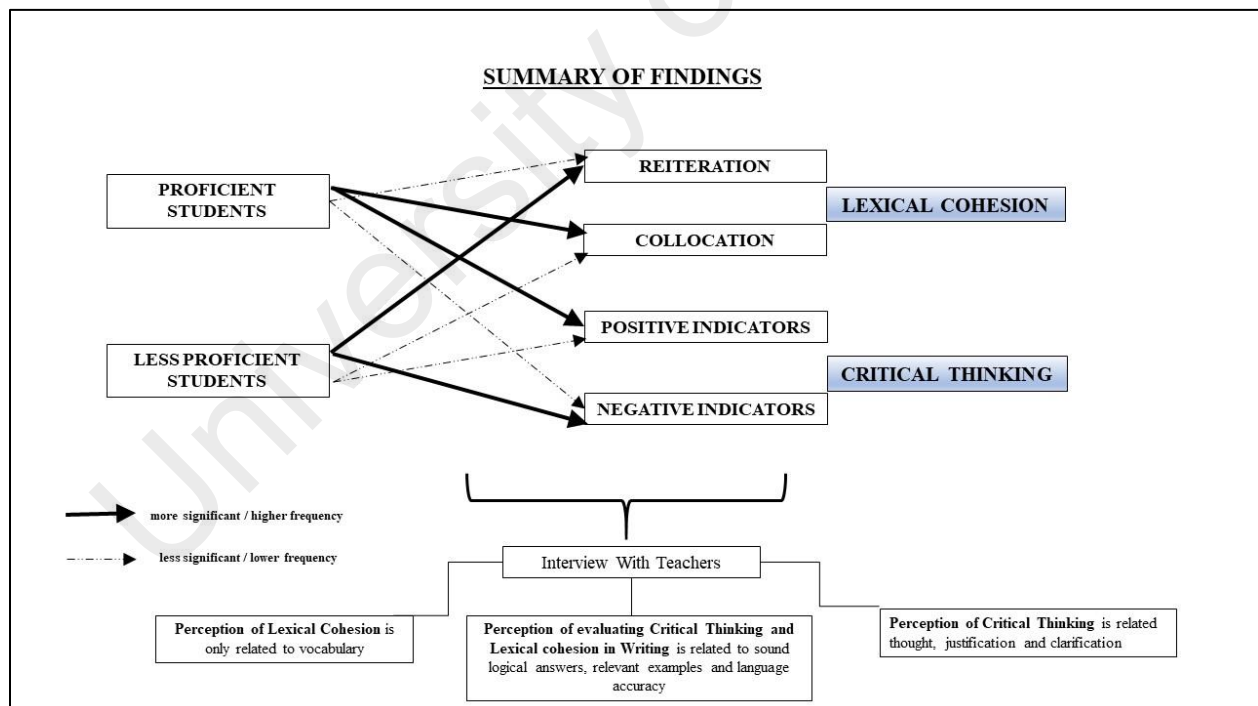
5.1 Introduction

The goals of this study were to 1) to determine the percentage of reiteration and collocation found in a proficient and less proficient students' writing, 2) determine the critical thinking ratio via content analysis and 3) delve into the relationship, if any, between the use of lexical cohesion in reflecting critical thinking performance by the participants.

In line with the research findings in chapter 4, the summary of findings, the implications of this study and recommendations for future study will be discussed in this chapter.

5.2 Summary of Findings

Figure 5.1 Summary of the findings



In terms of the frequency and percentage of reiteration and collocation found in a proficient and less proficient students' writing, generally, it was found that the frequency of reiteration was

the highest followed by the use of collocations in less proficient students' writing while the use of collocations was the highest followed by the use of reiteration for proficient students. These findings were presumably caused by several reasons such as participants familiarity with the use of lexical cohesion, their preference in using certain types of lexical cohesion to convey their message and also the nature of the task fulfilment itself which required the participants to involve a certain degree of cognition.

In terms of the results gained after using Newman et. al. content analysis method (1995) to assess the critical thinking in proficient and less proficient students' writing, the participants generally were able to contribute **relevant statements** (*R+ positive critical thinking indicator*), **clear, unambiguous statements** (*AC+ positive critical thinking indicator*), **novel** (*N+ positive critical thinking indicator*) and **linking facts, ideas and notions** (*L+ positive critical thinking indicator*) into their writing. However, both the proficient and less proficient participants were unable to draw on their **personal experience** (*O- negative critical thinking indicator*) and integrate it into their writing. In addition, it was very clear that proficient students use far more positive critical thinking indicators compared to less proficient students.

5.3 Pedagogical Implications

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

The upper secondary and pre-university students who will be pursuing tertiary education should realise the importance of being able to think critically and work towards the goal of becoming critical thinkers. They should be exposed to more learning activities to enhance critical

thinking in writing. Students should also be exposed to the schemes or methods used to assess their critical thinking skills as in this case the Newman et. al. (1995) content analysis scheme. This is to ensure that they are aware of how their written assignments would be assessed and the critical thinking characteristics that their written assignments are expected to exhibit. For instance, if they were introduced to Newman et.al. content analysis scheme (1995), they would realise that their written assignments should be a cohesive and coherent piece of writing where **relevant, novel, clear ideas** are found and they also need to be aware that the information included in their assignments 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 reiteration and collocation. This is because the effective use of these two lexical cohesion devices can help them in creating sound arguments by linking the ideas logically. They should also be exposed to the positive critical thinking characteristics when planning content for their writing.

5.4 Instructors / Teachers

As for instructors / teachers, it is important to create awareness that the ten broad critical thinking categories by Newman et. al. (1995) can be a guide and stepping stone to consciously train students to think critically when expressing their viewpoints as well as critiques when producing their written work. Instructors / teachers can draw the attention of students to the use of linguistic elements, particularly the use of a lexical cohesive device - 'collocation' in facilitating the flow of ideas. For instance, instructors can show to the students how the use of collocation can impact the writing quality by comparing writing samples. Helping students to acquire the skills of using linguistic elements such as collocation and reducing the use of reiteration in their writing is crucial to help them argue logically and improve their critical thinking ability. The instructors can motivate the students to think critically by gauging the content of students' written work 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.

5.5 Recommendations for Future Study

Since this study involved the teachers' feedback on the awareness of the overall lexical cohesion and critical thinking, the researcher concluded that teachers' lack of in depth knowledge regarding the critical thinking indicators and the linguistic features of lexical cohesion impact the teaching of writing. This clearly shows that there is a need to educate teachers on the negative and positive indicators based on Newman's et. al. (1995), as critical thinking features do impact the quality of writing. The marking scheme for writing can also include categories of critical thinking by Newman et. al (1995) for awarding scores for critical thinking skills.

5.6 Conclusion

The study investigated the use of lexical cohesion: reiteration and collocation and how the use of collocation reflects critical thinking. The findings indicated that there is a need to improve the teachers' knowledge of critical thinking as their concerns are more on the teaching of grammar, tenses and subject-verb agreement. As for the upper secondary and pre-university students who will be pursuing tertiary education, the knowledge on lexical cohesion and critical thinking are important to facilitate their academic achievement as it is related to their performance in written assignments, preparation of lab reports, writing of dissertations, thesis and research articles.

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