THE RELATIONSHIP BETWEEN CRITICAL THINKING ABILITY AND WRITING ABILITY

(A Correlational Study of the Sixth Semester Students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta)

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A *Skripsi*
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(Bachelor of Arts) in English Language Education

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ENDORSEMENT SHEET

The Examination Committee of the Faculty of Tarbiyah and Teachers' Training certifies that the "skripsi" (Scientific Paper) entitled **The Relationship between Critical Thinking Ability and Writing Ability** *(A Correlational Study of the Sixth Semester Students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta)*, written by **Ahmad Sugianto**, student's registration number 109014000181 was examined by the Committee on September 25, 2014. The "skripsi" has been accepted and declared to have fulfilled one of the requirements for the degree of "S.Pd" (Bachelor of Arts) in English language Education at the English Department.

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ABSTRACT

Ahmad Sugianto (NIM: 109014000181). The Relationship between Critical Thinking Ability and Writing Ability; A Correlational Study of the Sixth Semester Students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, Academic Year 2013/2014. A *Skripsi* of Department of English Education at Faculty of Tarbiyah and Teachers' Training of Syarif Hidayatullah State Islamic University Jakarta, 2014.

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Keywords: Critical Thinking Ability, Writing Ability

Skripsi which entitles *The Relationship between Critical Thinking Ability and Writing Ability* is aimed to analyze and find out the empirical evidence about critical thinking ability and its relation to writing ability. The population of this study encompasses all the sixth semester students of Department of English Education of which total is 121 students. From the population, only 60 students were taken as the sample of this study by using purposive sampling technique. Data were collected through tests. The collected data were analyzed by using Pearson Product Moment correlation.

The findings of this study arrive at a conclusion that there is any significant relationship between critical thinking ability and writing ability. The result of this study is indicated by the correlation coefficient (r_{xy}) 0.61. It shows that there is a high relationship between the critical thinking ability and writing ability because it is included in the scale of *r* interpretation score between 0.60−0.80. Next, with df=58, the score of *r* table (*rt*) at the level of significance 0.05 (α=5%) obtained is 0.26, so r_{xy}=0.61> $rt_{(5\%),(58)}$=0.26; besides, in comparison with the level of significance 0.01 (α=1%), the score of *rt* gained is 0.34, therefore, r_{xy} =0.61>$rt_{(1\%),(58)}$=0.34. Moreover, according to *t-test* conducted, the *t*=5.87 obtained is higher than *t table* (t_t) at the levels of significance 0.05 and 0.01. With df=58, the t_t at the levels of significance 0.05 and 0.01 obtained respectively are 2.01 and 2.68. Therefore, *t*=5.87>$t_{t_{(5\%),(58)}}$=2.01 and *t*=5.87>$t_{t_{(1\%),(58)}}$=2.68. Besides, based on the determination coefficient (r^2) found, the critical thinking ability has 37.21% contributions towards writing ability.

ABSTRAK

Ahmad Sugianto (NIM: 109014000181). The Relationship between Critical Thinking Ability and Writing Ability; A Correlational Study of the Sixth Semester Students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, Academic Year 2013/2014. A *Skripsi* of Department of English Education at Faculty of Tarbiyah and Teachers' Training of Syarif Hidayatullah State Islamic University Jakarta, 2014.

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Keywords: Critical Thinking Ability, Writing Ability

Skripsi yang berjudul *The Relationship between Critical Thinking Ability and Writing Ability* ditunjukkan untuk menganalisis dan mengetahui bukti empiris mengenai kemampuan berpikir kritis dan kaitannya terhadap kemampuan menulis. Populasi dari penelitian ini meliputi semua mahasiswa semester enam Jurusan Pendidikan Bahasa Inggris yang berjumlah 121 mahasiswa. Dari populasi tersebut, hanya 60 mahasiswa yang diambil sebagai sampel dari penelitian ini dengan menggunakan tekhnik sampling purposif. Data dikumpulkan melalui tes. Data yang terkumpul dianalisis dengan menggunakan korelasi *Pearson Product Moment*.

Temuan penelitian ini mencapai pada suatu kesimpulan yaitu adanya hubungan yang signifikan antara kemampuan berpikir kritis dan kemampuan menulis. Hasil penelitian ini ditandai dengan nilai koefisien korelasi (r_{xy}) sebesar 0.61. Nilai tersebut menunjukkan bahwa ada hubungan yang tinggi antara kemampuan berpikir kritis dan kemampuan menulis karena nilai tersebut termasuk ke dalam skala nilai tafsir *r* antara 0.60—0.80. Selanjutnya, dengan nilai df=58, nilai *r tabel* (*rt*) pada tingkat signifikansi 0.05 (α=5%) yang diperoleh sebesar 0.26, sehingga r_{xy}=0.61> $rt_{(5\%),(58)}$=0.26; selain itu, pada perbandingan dengan tingkat signifikansi 0.01 (α=1%), nilai *rt* yang didapat adalah sebesar 0.34, oleh sebab itu r_{xy} =0.61>$rt_{(1\%),(58)}$=0.34. Selanjutnya, berdasarkan uji-t yang dilakukan, nilai *t*=5.87 yang diperoleh lebih besar dibandingkan dengan nilai *t tabel* (t_t) pada tingkat signifikansi 0.05 dan 0.01. Dengan nilai df=58, t_t yang diperoleh pada tingkat signifikansi 0.05 dan 0.01 secara berturut-turut adalah 2.01 dan 2.68. Oleh karena itu, *t*=5.87>$t_{t_{(5\%),(58)}}$=2.01 dan *t*=5.87>$t_{t_{(1\%),(58)}}$=2.68. Selain itu, berdasarkan nilai koefisien determinasi (r^2) yang ditemukan, kemampuan berpikir kritis berkontribusi sebesar 37.21% terhadap kemampuan menulis.

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At last, the writer realizes and apprehends that this *skripsi* is far from being flawless; hence, he will be pleased to receive any constructive criticisms and suggestions from whoever reading this *skripsi*.

Tangerang, August 25, 2014

The Writer

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LIST OF ABBREVIATIONS

CT : Critical Thinking

FWA : Final Score of Writing Ability

CHAPTER I
INTRODUCTION

This chapter reveals the reasons, problems and importance underlying the writer to carry out this study. All of them are described and structured into background of the study, identification of the problem, limitation of the study, problem formulation, objective of the study, and significance of the study.

A. Background of the Study

Writing is one of the important mediums of communication. Through writing, the development of culture and civilization of one nation and country in the past time may be traced and known by people in the present time and such development may also be traced and known by people in the future time. As Fromkin, Rodman, and Hyams proclaim that writing is considered as one of the important mediums of communication which may across space and through time.[1]

Moreover, writing which is one of the language skills, particularly in the English language, is important for students to learn. It is because the English language in the present time, according to Trask, has been one of the dominant languages used as the medium of communication in the world in terms of science and technology and in most other contexts of life.[2] It, therefore, is necessary for the students who want to develop their knowledge through English and to convey their ideas in English. Besides, more specifically, it is important for students at Department of English Education of Syarif Hidayatullah State Islamic University Jakarta because the writing skill is included in the curriculum and it takes ten semester credit units (*sks/ satuan kredit semester*) and the students learn it from semester three to seven.[3]

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[1]Victoria Fromkin, Robert Rodman, and Nina Hyams, *An Introduction to Language*, (Massachusetts: Wadsworth, 2003), 7th Edition, p. 546.

[2]R.L. Trask, *Why Do language Changes*, (New York: Cambridge University Press, 2011), p. 84.

[3]*Pedoman Akademik Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta 2009-2010*, (Jakarta: Biro Administrasi Akademik dan Kemahasiswaan Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta, 2009), pp. 74—76.

However, writing may become a challenging skill for students to learn. It is due to the fact that writing is different from other language skills. It is not the skill that students may acquire naturally. The students are required to have some instructions in order that they may be able to write.[4] In addition, they also need to pay attention to several things that they can write effectively. In this case, Hedge points out that to write effectively, the ideas and information of the writing should be developed in a good organization; errors in writing should be minimized, hence the accuracy is emphasized so that the meaning of the writing is clear; vocabulary, grammatical pattern, and sentence structure used should be considered as well.[5]

Based on the writer's experience as he attended writing IV course a few months ago at Department of English Education of Syarif Hidayatullah State Islamic University, students sometimes had lack of awareness of those conditions as they were writing. In this case, a problem was found on one of the students' writing compositions then, for instance *She has beautiful voice when she read the Holy Quran* (this should be *She has a beautiful voice when she recites the holy Quran*), cited from a composition which entitles *My Lovely Mother*. In this case, the article *a* should be added before the phrase *beautiful voice* because it is included in a singular countable noun. Also, the word *recite*— with the inflection *–s* (*recite→recites*) which indicates the simple present tense—is better to be put on the sentence rather than *read* since it may have a different sense in the readers' mind; in this case, the word *recite* may correspond better to the words or phrase preceding it, namely *a beautiful voice*, and also the words or phrase which follows it, that is, *the holy Quran*.

In addition, based on the documentation of the preliminary study conducted, the writing ability of some of the sixth semester students of Department of English Education is still categorized fair (67. 15 in average) (see Appendix 18). This appears to become a problem since the sixth semester students are expected to have some better mastery and ability in terms of writing

[4]Jeremy Harmer, *How to Teach Writing*, (Essex: Pearson Education Limited, 2007), p. 3.
[5]Tricia Hedge, *Writing: Resource Books for Teachers*, (New York: Oxford University Press, 1990), p. 5.

due to the fact that they have already passed through 6 semester credit units in the writing course.

Furthermore, the other thing that should be paid attention related to the craft of writing is it is the skill that may not stand alone or in other words it requires as well as goes hand in hand with other language skills, particularly the reading skill. People who want to write well, they should enrich their knowledge and it can be achieved through reading activity.[6] Therefore, in this case, if students are learning to write, they are also required to have some adequate knowledge by reading any subjects that may facilitate their writing activity. However, the ability to read may not be enough for them since they should also have the ability to judge or determine the materials or subjects which are appropriate or have some merits to their writing. Thus, to deal with this problem, the students should also facilitate themselves with the ability to think critically of what they want to write so that the ideas of their writing may be effectively conveyed and decoded by everyone who reads their writing because they can give solid evidence which makes sense and understandable to the readers. As Langan states, "If you want to communicate effectively with readers, you must provide solid evidence for any point you make."[7] In addition, critical thinking is necessary for students because it will reveal how they use their mind and hand which work in a harmony that facilitate them to create a good writing. As Heffernan and Lincoln point out that the craft of writing is established and learnt through the writers' endeavors in terms of using their mind and hand in order that they may form words as well as gather the words into sentences.[8]

Regarding to students' critical thinking ability in relation to their writing skill, a problem was found in the same occasion as the writer attended the writing IV course at Department of English Education of Syarif Hidayatullah State Islamic University Jakarta. At that time, the problem was found as the students did

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[6]Jeremy Harmer, *The Practice of English Language Teaching*, (New York: Longman Publishing, 1996), p. 17.

[7]John Langan, *English Skills*, (New York: The McGraw-Hill Companies, Inc., 2001), 7th Edition, p. 4.

[8]James A. W. Heffernan and John E. Lincoln, *Writing: A College Handbook*, (New York: W. W. Norton & Company, Inc., 1986), p. 3.

the mid semester test. They were instructed to write an essay based on the topics given by their lecturer then. The topics had to be developed and written in accordance with a type of essay, i.e. an argumentative essay or a descriptive essay. So, before writing, the students had to determine first whether their topic would be best developed in an argumentative essay or descriptive essay. One of the writing topics was "Should we have a longer holiday?" That topic actually should be best developed in an argumentative essay; however, one of the students did and developed the essay topic in the form of descriptive essay. Accordingly, the composition had to be revised by the student after the mid semester test.

In addition to critical thinking ability and its relation to the craft of writing, some studies have revealed and found that the critical thinking ability has some relationships with the language proficiency and has some effects to the writing ability (Rosyati Abdul Rashid and Rosna Awang Hasyim, 2008; Nader Assadi, Hanief Davatgar, and Parinaz Jafari, 2013; M M Grosser and Mirna Nel, 2013; Samaneh Khodabakhsh, Shahrokh, and Morteza Khodabandehlou, 2013; see their overview on the related previous studies in Chapter II). However, although those previous studies above have revealed that writing ability is influenced by critical thinking ability, there was no any inspection that specifically focused on investigating critical thinking ability in relation to writing ability.

Based on the explanations above, to find out and reveal the further information and empirical evidence about the problems, particularly the critical thinking ability in relation to writing ability, this study was conducted.

B. Identification of the Problem

Based on the background of the study above, the problems of this study are identified as follows:

1. There are several things needed to consider as students want to write effectively, such as the organization of ideas and information, the vocabulary, the grammatical pattern, and the sentence structure of their writing, but some students of Department of English Education of Syarif Hidayatullah State

Islamic University Jakarta lacked awareness of those conditions as they were writing;

2. The sixth semester students of Department of English Education have passed through some writing courses, so it is expected that they have better proficiency as well as ability in writing, but it was found that some of their writing ability was still categorized as fair (67. 15 in average);
3. To write well and effectively, students should have some adequate knowledge of the subject matter of their writing, which can be obtained through reading activity as well as thinking critically of what they write, yet some students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta were found to be confused to develop their writing due to their lack of ability to think critically as they were writing.

C. Limitation of the Problem

The problem of this study is limited to critical thinking ability in relation to writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, academic year 2013/2014.

D. Problem Formulation

Based on the limitation of the problem above, the problem of this study is formulated into the following question: Is there any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, academic year 2013/2014?

E. Objective of the Study

In line with the problem of the study having been formulated above, the objective of this study is to obtain the empirical evidence about whether or not there is any significant relationship between critical thinking ability and writing

ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, academic year 2013/2014.

F. Significance of the Study

The result of this study is expected to provide some significance to the following persons:

1. Students

   The result of this study will give the students, particularly the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic university Jakarta academic year 2013/2014, the reflection and information in terms of their critical thinking ability in relation to their writing ability;

2. Lecturers

   The result of this study will be useful for the lecturers, particularly the lecturers of the college in which the writer conducted this study, as the consideration and concern to design a course that can facilitate their students to explore more about critical thinking ability through writing;

3. Other researchers

   The result of this study will be useful for other researchers as a consideration as well as a recommendation in case they will carry out any further studies in the same field.

CHAPTER II
THEORETICAL FRAMEWORK

This chapter presents the description of the concepts of this study associated with the ability to think critically and writing ability as well as the results of the related previous studies. Also, it reveals the synthesis of those concepts and the assumption of the relationship between the variables of this study which are manifested in a conceptual framework that leads to the research hypotheses.

A. The Concept of Critical Thinking Ability

1. Definition of Critical Thinking

Critical thinking may be considered as a complex activity since it involves many aspects to consider. Besides, it has recently become one of the foremost subject matters of many experts to discuss and explore. Regarding to this condition, a number of proposals related to the definitions of critical thinking are suggested by some experts.

First, according to Cottrell, critical thinking is defined as: "A cognitive activity, associated with using the mind."[1]From this, it can be considered that critical thinking is an activity in which one involves one's mind to cope with the matters found.

Meanwhile, Paul and Elder reveal that critical thinking is the art associated with the ability to analyze or to evaluate thought.[2] Similarly, Washburn points out that critical thinking relates to the activity to criticize people or things both in terms of the negative side and the positive side of them that may lead to the comprehension and best judgment about them.[3] Thus, one should carefully consider every aspect in case one is thinking critically.

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[1]Stella Cottrell, *Critical Thinking Skills: Developing Effective Analysis and Argument*, (New York: Palgrave Macmillan, 2005), p. 1.

[2]Richard Paul and Linda Elder, *The Miniature Guide to Critical Thinking: Concepts and Tools*, 2014, p. 4, (www.criticalthinking.org).

[3]Phil Washburn, *The Vocabulary of Critical Thinking*, (New York: Oxford University Press, Inc., 2010), p. 3.

Next, Moore and Parker state that critical thinking is the activity of evaluating specific claims through considering arguments plausibly.[4] Furthermore, Ruggiero explains that critical thinking is the mental process involving the activity to investigate ideas as well as to find out the meaning of the ideas and to judge the power of the meaning of the ideas whether or not it is defensible.[5] In other words, to think critically one should logically consider the matter found by investigating as well as making interpretation, and evaluating the weakness and the strength of the matters found.

To sum up, based on the definitions and explanations above, critical thinking may be regarded as an art or ability as well as an activity employing mind to think of, to criticize, to analyze, and to evaluate people or things carefully, not only the bad side but the positive side of them as well. Besides, it is conducted through a series of processes started from investigating ideas to making a judgment of the strength of the meaning of the ideas.

2. Critical Thinking Process

The critical thinking process stems from the activities of thinking itself. As Ruggiero reveals that there are some activities of thinking which are described in Table 2.1 as follows:

Table 2.1
The Activity of Thinking[6]

No	Activity	Definition
1.	Investigation	to probe the evidence or data related to the issue or the matter arises.
2.	Interpretation	to make a decision of the meaning of the evidence.
3.	Judgment	to determine the conclusion about the issue or the matter arises.

[4]Brooke Noel Moore and Richard Parker, *Critical Thinking*, (New York: The McGraw-Hill Companies, Inc., 2007), 8th Edition, p. 4.

[5]Vincent Ryan Ruggiero, *The Art of Writing*, (California: Alfred Publishing, Co. Inc., 1981), p. 52.

[6]Vincent Ryan Ruggiero, *Beyond Feelings: A Guide to Critical Thinking*, (New York: The McGraw-Hill Companies, Inc., 2004), p. 21.

Based on Table 2.1 above, the critical thinking process respectively encompasses *the activity of investigation* which is the activity to get any evidence related to the matters arise, *the activity of interpretation* or the activity to determine the meaning of the evidence obtained from the investigation conducted, and *the activity of judgment*, that is, the activity of evaluating the issue by making a conclusion based on the interpretation and investigation conducted previously. All of the three activities are conducted gradually and respectively started from investigation to judgment.

In line with Ruggiero's description above, Washburn states that the thinking process is preceded by investigation which leads to the last product of thinking process, i.e. conclusion or judgment.[7]

Based on the explanations above, there are at least three activities which are included in critical thinking process, namely investigation, interpretation, and judgment. In this case, the investigation is an activity, basically comes first, which aims to find the evidence or information about the issues or matters arise. Next, it goes on to the subsequent step or activity, i.e. interpretation which means to interpret or determine the meaning of the evidence or information from the investigation conducted beforehand. The last one is judgment, that is, making inferences or drawing conclusions from the data or evidence as well as the information that have been obtained in the previous activities, i.e. investigation and interpretation about the issue.

3. Kinds of Critical Thinking Abilities

Critical thinking involves many levels of thinking. As Teays states that critical thinking covers the lower and higher order thinking, which, in this case, the lower order thinking consists of the activities of memorizing, summarizing, labeling, observing, and sorting; meanwhile, higher order thinking encompasses the activities of applying, synthesis, drawing inferences, comparison or contrast,

[7]Phil Washburn, *op. cit.*, p. 52.

justification, analysis, evaluation, moral reasoning, and using deductive and inductive reasoning.[8]

From Teays' statement above, critical thinking is described in a broader sense involving all levels of thinking in which in terms of cognitive process it relates to many activities or levels in the revised Bloom's Taxonomy which is presented in Table 2.2 as follows:

Table 2.2
The Revised Bloom's Taxonomy[9]

No.	Structure	Description
1.	Remember	to recall or recognize knowledge which is relevant, particularly taken from long term memory. Other terms used beside *remember* are *recall* and *recognize*.
2.	Understand	to consider and decide the meaning of oral or written messages received. Other variant terms of this level are *interpret*, *exemplify*, *classify*, *summarize*, *infer*, *compare*, and *explain*.
3.	Apply	to conduct something in a certain situation. Other terms used, having the same sense as *apply*, are *execute* and *implement*.
4.	Analyze	to divide things in an organized way and then observing the relationship between them. Other terms used other than *analyze* are *differentiate*, *organize*, and *attribute*.
5.	Evaluate	to judge something in accordance with criteria and standards. In the same sense, instead of *evaluate*, the terms *check* and *critique* may be used.
6.	Create	to produce a new original product through unifying some elements of something. Other similar terms to *create* are *generate*, *plan*, and *produce*.

Table 2.2 above presents the structure of the cognitive level of the Revised Bloom's Taxonomy which is explained hierarchically, from lower order thinking level to higher order thinking level, or from the structure of *remember* to *create*.

On the other hand, Kuebli, Harvey, and Korn have the same view as Teay's statement above; in this case, they point out that critical thinking abilities derive from various abilities and competences included in the Revised Bloom's Taxonomy, yet they add an ability which is included in the critical thinking

[8]Wanda Teays, *Second Thoughts: Critical Thinking for a Diverse Society*, (New York: The McGraw-Hill Companies, Inc., 2006), 3rd Edition, p. 3.

[9]David R. Krathwohl, A Revision of Bloom's Taxonomy: An Overview, *Theory into Practice*, Vol. 41, 2002, p. 215.

abilities, namely inferring.[10] Following, Table 2.3 describes the detail abilities included in critical thinking proposed by Kuebli, Harvey, and Korn:

Table 2.3
Various Abilities of Critical Thinking[11]

No.	Critical Thinking Abilities	Description
1.	Remembering	The ability to recognize and recall knowledge that derives from memory.
2.	Comprehension	The ability which comes after *remembering ability*. It is the ability that enables someone to summarize or restate other people's ideas with his/her own words.
3.	Application	The ability to employ the knowledge that has already gained in some certain situations.
4.	Analysis	The ability to separate and examine any ideas and understand the correlation in them.
5.	Inferring	The ability to reach and make any conclusion from the evidence found and gained.
6.	Evaluation	The ability to judge ideas or claims based on the evidence.
7.	Synthesizing	The ability of creating something or ideas new and fresh.

By comparing Table 2.2 and Table 2.3 above, it may be considered that the critical thinking abilities proposed by Kuebli, Harvey, and Korn have the close relationship to the Revised Blooms' Taxonomy. In this case, the Revised Blooms' Taxonomy represented in Table 2.2 becomes the basis of the various abilities of critical thinking in Table 2.3. The various abilities of the critical thinking presented in Table 2.3 are explained in the form of *noun* which stems from the Revised Bloom's Taxonomy of which form is *verb*. Besides, there is an additional ability, i.e. the inferring ability, which is excluded in the Revised Bloom's

[10]Janet E. Kuebli, Richard D. Harvey, and James H. Korn, "Critical Thinking in Critical Courses: Principles and Applications", in Dana S. Dunn, Jane S. Halonen, and Randolph A. Smith (Eds.), *Teaching Critical Thinking in Psychology: A Handbook of Best Practices*, (Chichester: Wiley-Blackwell, 2008), p. 142.

[11]*Ibid*.

Taxonomy. It, however, actually still associates with one of the structures of the Revised Blooms' Taxonomy, that is, *understand* (see the description of the structure of *understand* in Table 2.2). In addition, based on Table 2.3 above, although the inferring ability may be considered as the exclusive and additional ability in critical thinking, it may not still stand alone since it will need and correlate with other critical thinking abilities, starting from the remembering ability to synthesizing ability, for instance if a person wants to make some inferences or to draw a conclusion about some issues, he/she is required to have some knowledge that support his/her conclusion about the issues, and the knowledge can be obtained through recalling some knowledge which he/she has already known as well as it can be obtained from comprehending the issues; additionally, a person may judge something if he/she can draw some conclusion from the data or evidence found.

However, Ennis argues that the critical thinking abilities deriving from Bloom's Taxonomy have some problems, particularly in case these are employed to structure the critical thinking assessment; thus, to answer the problems, he proposes some abilities that should be owned by someone to be considered as a cultivated critical thinker as follows:

a. The ability to judge or decide which sources are credible and those which are not;
b. The ability to make the identification of conclusions, reasons, and assumptions;
c. The ability to create an evaluation of the quality of an argument, as well as to consider the acceptability the reasons, assumptions, and evidence related to the argument;
d. The ability to develop and defend a position against criticisms;
e. The ability to initiate someone to bring clarifying questions;
f. The ability to prompt or initiate experiment and make a judgment of its design;
g. The ability to create the appropriate definition of the rules in accordance with their context;

h. The ability to be the inclusive or open-minded person;

i. The ability to feel curious about information;

j. The ability to make a conclusion carefully.[12]

Moreover, according to *The Delphi Report* (a report for a critical thinking research conducted by 46 experts from various disciplines—Philosophy, Education, Social Sciences, and Physical Sciences—discussing critical thinking, which resulted some consensus related to critical thinking), the critical thinking cognitively encompasses some skills and sub skills which are acknowledged by the Delphi experts presented in Table 2.4 as follows:

Table 2.4
Consensus List of Critical Thinking Cognitive Skills and Sub Skills[13]

No.	Skills	Sub Skills	Examples
1.	Interpretation	Categorization	To make recognition of a problem and its character; to make a decision to classify information, to create a report of things happened; to make a classification of data, findings, or opinions.
		Decoding significance	To make a detection and description of someone's question purposes; to make an appreciation of a certain gesture in a social situation provided; to apprehend the use of irony or rhetorical questions in debate; to create an interpretation of data presented.
		Clarifying meaning	To paraphrase of someone's statement; to look for a useful example which can help explain a problem to someone else; to create a clarity of an ambiguity by providing its distinction.
2.	Analysis	Examining ideas	To make the identification of a phrase or expression which can lead someone's opinion; to find out and determine the similarity and difference of particular views; to determine the systematic ways of a complicated assignment; to create a view of abstract concept.
		Identifying arguments	To determine the plausibility of a claim given in a paragraph or passage.
		Analyzing arguments	To determine and create the identification of the author's major claims and their reasons of an argumentative passage.

[12]Robert H. Ennis, Critical Thinking Assessment, *Theory into Practice*, 32, 1993, pp. 179—180.

[13]Peter A. Facione, *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*, (Millbrae: The California Academic Press, 1990), pp. 6—11.

No.	Skills	Sub Skills	Examples
3.	Evaluation	Assessing claims	To create recognition of the credibility factors of an event witness; to determine the plausibility of action in a certain situation; to determine the truth and falsity of a claim provided.
		Assessing arguments	To make an evaluation or judgment whether or not a conclusion of an argument follows its premises.
4.	Inference	Querying evidence	To make a judgment of the background of information that can help support one's opinion; to make a plan of a discovery that can provide the information availability.
		Conjecturing alternatives	To create and propose a set of options related to a problem solving; to determine and scheme the difficulties and advantages of certain priorities in a decision making.
		Drawing conclusions	To make inferences to test an empirical hypothesis.
5.	Explanation	Stating results	To convey, state, or write someone's reasons of the views provided, matters, research findings, judgments, and so on.
		Justifying procedures	To explain someone's choice of a particular statistical test for purposes data analysis; to design a graphic display which represents the quantitative information used as evidence.
		Presenting arguments	To write a paper in which one argues for a given position or policy.
6.	Self-Regulation	Self-examination	To examine a view of a controversial issue with sensitivity to the possible influences of personal bias or interest.
		Self-correction	To make a revision of factual deficiency in a work.

The Table 2.4 above reveals that critical thinking comprises some skills in which each skill has several divisions. Some of the skills derive from the structure of cognitive process in the Bloom's Taxonomy. The two major skills (analysis and evaluation) use the same terms as what are used in the Bloom's Taxonomy (see Table 2.2). Meanwhile, other skills still have some relations to the structure of Bloom's Taxonomy, for instance the *interpretation* skill is actually one of the variant terms used for the cognitive structure of *understand*. Besides, the *inference* skill is the same as the *inferring* ability mentioned by Kuebli, Harvey, and Korn in Table 2.3 which also stems from the cognitive structure of *understand* in the Bloom's Taxonomy. Again, the *explanation* skill is still in relation to *comprehension* proposed by Kuebli, Harvey, and Korn in Table 2.3

which actually derives from the cognitive structure of *understand* in Bloom's Taxonomy. At last, although the skill of *self-regulation* appears as an exclusive skill of which term is different from other cognitive structures of Bloom's Taxonomy, yet by considering its sub-skill (self-examination and self-correction), the *self-regulation* skill is actually have a relation to the other cognitive structures of Bloom's Taxonomy, namely *evaluate* and *analyze*.

To sum up, despite having variant terms and some different proposals prompted by some experts, the critical thinking abilities have some influences and relations one another, of which influence and relation are interdependent.

4. Benefits of Critical Thinking

Through thinking critically, one may make precise consideration towards one's works, and one may obtain several benefits that will facilitate not only in terms of the academic performance but also in terms of dealing with the real life problems. As Cotrell argues that by thinking critically, a number of benefits can be obtained as follows:

a. The work can be conducted accurately and carefully;
b. The ability to determine something which is relevant in writing (noting) can be more accurate and specific;
c. The ability to conduct the problem solving and project management can be done accurately;
d. It can raise a feeling of confidence of successful outcome in complex problems and projects;
e. The work and academic attainment can be better improved.[14]

Meanwhile, Paul and Elder mention that critical thinking may be beneficial in terms of:

a. Bringing a clear and accurate formulation of vital questions and problems;
b. Having an effective interpretation of ideas and information;
c. Making reasonable conclusions and solutions which are in accordance with relevant criteria and standards;

[14]Stella Cottrell, *op. cit.*, p. 4.

d. Thinking inclusively or open minded;
e. Having an effective communication with others in coping with complex problems.[15]

Based on the explanations above, critical thinking may be considered as the ability which is important for every individual and particularly for students since it helps them do their tasks effectively and accurately, for instance as they are writing, they may find themselves easily develop their ideas since they can think the ideas inclusively, also they may find themselves will be able to keep in touch with others effectively to deal with any problems. All of these tasks can be facilitated as they have the adequate critical thinking ability.

5. RED Model of Critical Thinking

The keys to critical thinking encompass three factors which are used in *Watson-Glaser Critical Thinking Appraisal*® as the indicator to assess critical thinking which is shown by Figure 2.1 as follows:

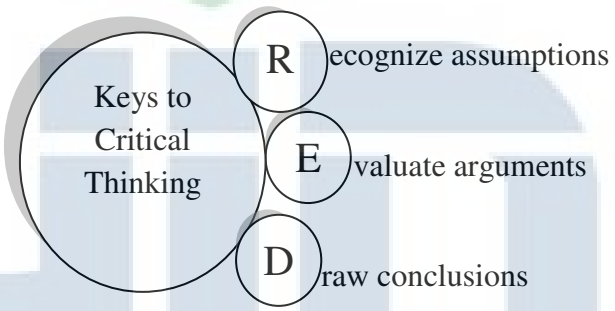

Figure 2.1
RED Model[16]

The RED model in figure 2.1 above is described as follows:

a. Recognize Assumptions

Assumptions are considered as the statements which are supposed to be true without some proves. These are one of the key elements or components in critical thinking which help discover information gaps and improve or develop views of issues arise. Also, these help individuals evaluate the merits of a

[15]Richard Paul and Linda Elder, *loc. cit*.
[16]*Watson-Glasser™ User Guide and Technical Manual UK Supervised and Unsupervised Versions 2012*, (UK: Pearson Education, Inc., 2011), p. 6, (www.talentlens.co.uk)

proposal, policy or practice in case the individuals are aware of the assumptions and directly assessing the assumptions' appropriateness to the situation encountered;

b. Evaluate Arguments

Arguments are considered as the statements of which purpose is to persuade someone to believe or to act a certain way. To evaluate arguments, someone is required to have the ability to analyze statements objectively and accurately. The ability to evaluate arguments is useful to determine the influence of the statements and what actions should be conducted by considering the statements presented;

c. Draw Conclusions

It is the ability to reach a conclusion which logically follows the evidence provided. It comprises the ability to evaluate the relevant information, to make a judgment about the plausibility of different conclusions, and to determine or to choose the conclusion which is the most appropriate with the evidence and to avoid overgeneralization of statements which are outside of the evidence presented. In addition, the ability to draw conclusions is assessed through three kinds of tests, i.e. inference, interpretation, and deduction.[17]

1. Test of inference refers to the test to determine the truth of conclusion based on the available information;
2. Test of interpretation refers to the test to consider evidence and to decide whether the generalizations or conclusions gained from the available data are reasonable;
3. Test of deduction refers to the test to decide if the conclusions provided are plausible based on the available information.[18]

In conclusion, the RED model presented above is only one of the many models of critical thinking proposed by some experts that can be used as one of the alternatives to structure the critical thinking assessment. This model is given

[17] *Ibid.*, p. 7.
[18] *Ibid.*, pp. 3—4.

here to provide the overview of the scheme of the critical thinking test used in this study.

B. The Concept of Writing Ability

1. Nature of Writing

Writing is one of the four major language skills. It is commonly considered as the active or productive language skill. Through writing, people can convey their ideas to someone else.

According to Browne, writing is a complex activity involving many skills to determine ideas and to transfer the ideas onto a piece of a paper clearly and comprehensibly for the readers.[19]

Meanwhile, Ploeger states that writing is an activity intended to observe the knowledge and feeling of a writer about something, which, then the result is communicated to his/her audience/readers. [20] On the other hand, Langan asserts that writing is a skill that can be learned and developed through practices.[21]

Based on the explanations above, it may be concluded that writing is an activity that involves a series of steps to transfer thought or ideas to paper. When the writers are writing, they try to convey the things in their mind to readers through the writing that they write. Also, writing is a skill that can be learned and developed through practices which mean the more often the learners practice to write, the better they will be able to write.

2. Writing Process

To write well, there are a number of processes to consider by writers. Each writing process has its own significance and goal. Therefore, in order that writers can create the effective composition, each writing process should be conducted carefully.

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[19]Ann Browne, *Teaching and Learning Communication, Language and Literacy*, (London: Paul Chapman Publishing, 2007), p. 81.

[20]Katherine Ploeger, *Simplified Paragraph Skills*, (Illinois: NTC/Cotemporary Publishing Group, 2000), p. xiii.

[21]John Langan, *Exploring Writing: Paragraph and Essay*, (New York: The McGraw-Hill Companies, Inc., 2008), p. 7.

Oshima and Hogue propose the four steps in the writing process comprising creating ideas, organizing ideas, writing a rough draft, and polishing the rough draft by editing and making any revisions needed.[22]

In line with Oshima and Hogue's view above, Ploeger reveals that the writing skill covers five processes as follows:

a. Planning

   To think and contemplate about what to write by determining a topic, and gathering some information related to the purpose, audience, topic, and main idea of the writing;

b. Drafting

   The process in which a writer pours his/her outline or idea into a text;

c. Simmering

   This is the incubation time on which the writer takes a break or keeps away from the writing activity for a few moments. In case there is any ideas come into the writer's mind, the ideas will be saved into a folder to be used later;

d. Revising

   To reconsider and focus on different aspects of the composition, for instance the organization of the ideas and the sentence structure;

e. Editing

   To have any correction of the shortcoming or errors of the writing found, such as punctuation, spelling, and so on.[23]

Moreover, Ruetten and Pavlik state that there are four steps of the writing process as follows:

a. Prewriting

   The step which is commonly conducted in the initial process of writing before the writer writes his/her thought onto a piece of paper. It comprises the activity of considering audience or the readers, getting ideas, narrowing the topic through brainstorming, deciding a controlling idea, choosing support of the idea, and organizing the idea logically;

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[22]Alice Oshima and Ann Hogue, *Introduction to Academic Writing*, (New York: Pearson Education, Inc., 2007), 3rd Edition, p. 15.

[23]Katherine M. Ploeger, *op. cit.*, pp. 6—10.

b. Drafting

The step in which a writer writes any ideas that come into his/her mind into a paragraph;

c. Revising

The step in which a writer makes any warranted changes of his/her work and makes sure that the ideas will be understandable and able to be followed by the reader;

d. Editing

The steps in which a writer rechecks his/her composition, particularly in terms of its grammar, punctuation, and spelling.[24]

To sum up, based on the explanations above, the writing process respectively comprises:

a. Making a preparation, planning and creating the ideas about what to write;
b. Transferring the thought/ideas into a text;
c. Making sure whether or not the ideas are developed well;
d. Rechecking the writing again if there are still some errors on its punctuation, spelling, grammar and so on.

Nevertheless, Harmer argues that to get a real final version of writing, a writer frequently needs to repeat some stages/steps as described in Figure 2.2:

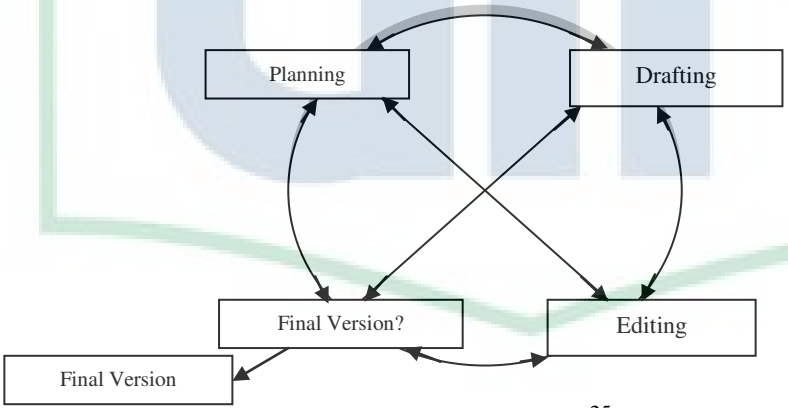

Figure 2.2[25]
The Writing Process Wheel

[24]Mary K. Ruetten and Cheryl Pavlik, *Developing Composition Skills: Academic Writing and Grammar*, (Boston: Heinle Cengage Learning, 2012), 3rd Edition, pp. 20—25.

[25]Jeremy Harmer, *How to Teach Writing*, *op. cit*., p. 6.

Figure 2.2 above reveals that the writing processes which lead to the last real final version of writing are a recursive process. A writer needs to do some stages, processes, or steps to finish his final draft. Although it seems that the writer has attained his/her final draft version, he/she should recheck his writing through re-planning, re-drafting, and re-editing to get his/her real final draft version. In addition, Figure 2.2 above also indicates that among one stage and other stages might be overlapping during the writing process. For instance, as a writer is in the planning process, he/she can do the editing process while he/she is also trying to do a drafting process, and vice versa.

In conclusion, the writing process which consists of some stages/steps depends upon the writer's views whether he/she has already obtained the goal of his/her writing. It is feasible for him/her to do some recursive stages/steps until he/she feels that the real final version of his/her writing has been obtained.

3. Characteristics of Good Writing

The quality of writing which is considered as the good one is established through the writer's endeavor to create a work that is not only valuable for him/her but also for others; besides, it is also associated with the elements building the writing, for instance the word choice used, a sequence in which it is organized, and the other formal agreement (usage).

Hairston mentions that there are some characteristics of good writing as follows:

a. Significant

   A writing which is considered as a significant work is if it can fulfill the readers' need. In this case, not only they can enjoy as they read it but also they can learn something from it;

b. Clear

   A clear writing provides an apparent depiction or explanation to the readers that lead them not to reread it many times to get its point or idea;

c. Unified and Well Organized

A unified and well organized writing is developed coherently, namely each sentence in a paragraph develops or supports the main idea of the paragraph and connects to sentences preceding and following it. In other words, it develops with a logical sequence;

d. Economical

Wordiness is not found in an economical writing; in this case, a writer conveys and expresses his/her ideas directly to the point;

e. Adequately Developed

An adequately developed writing makes the readers to read it easily for it is provided and supported with key points that enable them to understand it well;

f. Grammatically Acceptable

Mistakes (in terms of usage and mechanics) are not found as the writing is grammatically acceptable because the standard or formal language and appropriate punctuation as well as spelling are applied and employed well.[26]

Moreover, White points out that a good writing is produced through a careful thinking that goes along with four pillars as follows:

a. The Appeal to Target Audience

The audience/readers' needs have been understood and considered well by the writer so that they are interested to read the writing;

b. A Coherent Structure

The organizational patterns or schemes (i.e. introduction, body, and conclusion) are connected one another well;

c. A Smooth, Detailed Development

The ideas of the writing are developed and expanded through raising the general points and discussing them in detail;

d. An Appropriate Style

The meaningful combination of word choices in conveying the intended ideas are provided well.[27]

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[26]Maxine Hairston, *Contemporary Composition Short Edition*, (Boston: Houghton Mifflin Company, 1986), pp. 5—10.

In summary, based on the explanations given above, the good writing has the characteristics as follows:

a. Something beneficial or knowledge is provided so that the readers will be interested to read it;
b. A good sequence is provided to develop the ideas between the sentences or paragraphs;
c. The ideas of the writing are expressed clearly and directly to the point;
d. The word choice or diction, and correct grammar or usage are employed well and appropriately.

4. Uses of Writing

The uses of writing associate with the writer's goal as well as adjust to the readers' needs. Therefore, in case one is willing to create a work in the written form, he/she is required to determine first what he/she is writing for and to whom he/she will communicate it.

Grenville points out that writing has several uses as follows:

a. To Entertain

   It is considered as a way to keep in touch with readers, particularly by engaging their feeling through providing emotion or exciting plot in the writing. Some examples of this use can be found in novels, stories, poems, song lyrics, plays, and screenplays;

b. To Inform

   It is a writing which is intended to tell readers about something. For instance, it can be found in the form of newspaper, articles, scientific or business reports, instructions or procedures, and essay for school and university;

c. To Persuade

   Providing evidence is essential in this kind of writing since the main purpose of this kind of writing is to convince the readers about something they read. A

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[27]Fred D. White, *The Writer's Art: A Practical Rhetoric and Handbook*, (New York: Wadsworth, Inc., 1986), pp. 7—9.

number of examples of this writing use can be found in advertisements, articles, newspaper, and magazine.[28]

Moreover, Browne reveals the other uses of writing other than Grenville's view above which consist of writing to convey a feeling/opinion/idea, to make a request, and to create a record.[29]

To sum up, each use of writing reveals the reason of why writers create a composition. In addition, different products or forms of the writing depends upon the use of the writing itself.

C. Related Previous Studies

The following are the previous studies related to the variables of the present study comprising critical thinking ability and writing ability. First, a study which entitles *The Relationship between Critical Thinking and Language Proficiency of Malaysian Undergraduates* was conducted by Rosyati Abdul Rashid and Rosna Awang Hasyim. The study was conducted to find out the critical thinking ability of Malaysian undergraduates and its relationship with their language proficiency. It was carried out in Universiti Utara Malaysia of which total of the participants were 280 undergraduates taken from the university. The instruments used in the study comprised a demographic questionnaire and a test. The demographic questionnaire was intended to gain and to collect the undergraduates' language proficiency data—encompassing speaking, reading, writing, and grammar—which derived from Sijil Pelajaran Malaysia (SPM) and Malaysian University English language Test (MUET); whereas the test (the translated Bahasa Malaysia version of the Cornell Critical Thinking Test Level X) was used to find out the undergraduates' critical thinking. The data analysis of the study used Pearson product moment correlation. Based on the findings of the

[28]Kate Grenville, *Writing From Start to Finish: A-Six Steps Guide*, (Crows Nest: Allen & Unwin, 2001), pp. 1—2.

[29]Ann Browne, *op. cit.*, pp. 81—82.

study, it was found that there was a significant correlation between the undergraduates' critical thinking ability and their language proficiency.[30]

The next study of which title is *The Effect of Critical Thinking on Enhancing Writing among Iranian EFL Learners* was conducted by Nader Assadi, Hanief Davatgar, and Parinaz Jafari. It was carried out to find out whether critical thinking has effects on learners' writing. In addition, it was conducted in private English language institute in Tabriz, Iran. There were 60 students, whose proficiency level was intermediate, as the participants of the study. The method used in the study was experimental study. The participants of the study were equally divided randomly into two groups, i.e. the first group was the control group and another one was the experiment group. In the experimental group, the participants got some treatments associated with the successful critical thinking strategies over three weeks instructions, whereas the control group did not receive any treatment like in the experimental group. The study concluded that critical thinking instruction had effects on learners' writing; in this case, it showed that the participants from the experimental group had the higher scores in post test than the control group.[31]

In addition, *The Relationship between the Critical Thinking Skills and the Academic Language Proficiency of Prospective Teachers* was the next related previous study conducted by M M Grosser and Mirna Nel. It was carried out at a South African university of which participants was 89 first year students studying in Bachelor of Education (BEd) degree. The study used a correlation design. The instruments used were tests, one was the test to measure the participants' critical thinking, i.e. Watson Glaser Critical Thinking Appraisal, and another one was to find out their academic language proficiency, i.e. Test of Academic Literacy Levels (TALL). The data was analyzed using Pearson product moment correlation

[30]Rosyati Abdul Rashid and Rosna Awang Hasyim, The Relationship between Critical Thinking and Language Proficiency of Malaysian Undergraduates, *Edu-COM 2008 International Conference*, 2008, pp. 373—384.

[31]Nader Assadi, Hanieh Davatgar, and Parinaz Jafari, The Effect of Critical Thinking on Enhancing Writing among Iranian EFL Learners, *International Journal of Scientific and Engineering Research*, 4, 2013.

which mentioned that there was a significant correlation between academic language proficiency and critical thinking as a general competency.[32]

Furthermore, a study under the title *The Impact of Critical Thinking Tasks on Paragraph Writing Ability of Iranian EFL Learners* was conducted by Samaneh Khodabakhsh, Shahrokh, and Morteza Khodabandehlou. It was conducted in Kish language school in Tehran, Iran. The total participants of the study were 60 students who studied English in the school. The instruments used were tests comprising Oxford Placement Test (OPT), the Cornell Critical Thinking test form X, and a test of written English. They were divided into two groups, i.e. control and experimental groups, determined randomly based on the result of the tests covering English proficiency, paragraph writing ability, and critical thinking. The experimental group had a treatment involving some critical thinking tasks while they were learning paragraph writing tasks; meanwhile, the participants from the control group only learned paragraph writing based on a handout taken from a certain book. After the participants received a post test, then the data of the study were analyzed using descriptive statistical methods (mean and standard deviation), inferential statistics (t-test), and analysis of covariance (ANCOVA). The findings of the study mentioned that the participants who received techniques of critical thinking while they were learning paragraph writing over the instructions attained a greater improvement in their writing abilities; it was shown from the experimental group who outperformed the control group in terms of writing ability.[33]

In comparison with the related previous studies discussed and reviewed above, this study has the position and similarity or difference from those related previous studies above portrayed in Figure 2.3 as follows:

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[32]M M Grosser and Mirna Nel, The Relationship between the Critical Thinking Skills and the Academic Language Proficiency of Prospective Teachers, *South African Journal of Education*, 33, 2013, pp. 1—17.

[33]Samaneh Khodabakhsh, Shahrokh Jahandar, and Morteza Khodabandehlou, The Impact of Critical Thinking Tasks on Paragraph Writing Ability of Iranian EFL Leaners, *Indian Journal of Fundamental and Applied Life Sciences*, 3, 2013, pp. 639—648.

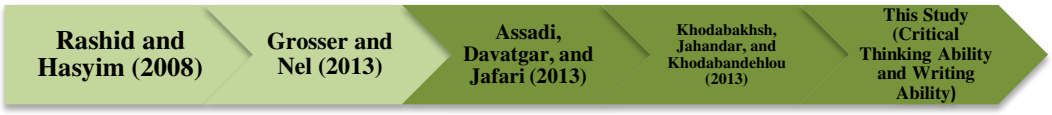

Figure 2.3
Degree of Similarity between the Previous Studies and This Study

Figure 2.3 above shows the similarity between the previous studies and this study. The darker the color, the more similar the previous study with this study. In this case, this study is more specific and detail than other investigations conducted by other researchers. First, although Grosser and Nel and Rashid and Hasyim carried out the studies with similar design to this study (the correlational design), the inspection in their studies are broader than this study. They investigated critical thinking in relation to the language proficiency as a general competency in a unity. On the other hand, this study is conducted to find out critical thinking ability in relation to one of the parts of the language proficiency, i.e. writing skill. Next, in comparison with the study conducted by Assadi, Davatgar, and Jafari and another one which is conducted by Khodabakhsh, Jahandar, and Khodabandehlou, although those studies investigated the same variables, i.e. critical thinking and writing, they applied different design from this study. Their studies' designs are categorized as an experimental design since those studies are intended to find out the impact or influence of critical thinking toward the writing skill. By any considerations of the reviews of the related previous studies above, it can be considered that this study is not a replica of the previous studies, instead it is an expansion as well as a more specific research focusing on critical thinking ability and writing ability as the variables of this study.

D. Conceptual Framework

Writing is an activity that is not easy to do for some certain people. To write well, a writer needs some processes and practices. Besides, writing is not only to use a pen or pencil to input a series of words onto a piece of paper; however, it is a process of discovering ideas and communicating the ideas into a written form; thus, it requires the writers to have some considerations to make

their writing interesting as well as meaningful for their readers. The writers are required to have the ability to employ and involve their mind by providing some adequate evidence and information that are reasonable for their readers. As a result, the writers' critical thinking ability to do such thing is needed. Following, Figure 2.4 describes the estimated relationship between critical thinking ability and writing ability.

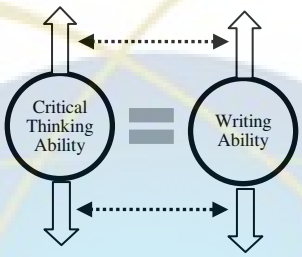

Figure 2.4
Conceptual Framework of Critical Thinking Ability and Writing Ability

Figure 2.4 above reveals that the relationship between critical thinking ability and writing ability may be directly proportional. It means that if the writers are good at critical thinking ability, they are supposed to have a good writing ability; meanwhile, if they have poor critical thinking ability, they are supposed to have a poor writing ability.

E. Research Hypotheses

This study proposes some hypotheses as follows:

1. Null hypothesis (H_0): there is no any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014;
2. Alternative hypothesis (H_a): there is any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014.

CHAPTER III
RESEARCH METHODOLOGY

This chapter describes the research methodology which comprises the period on which this study was executed, the scheme underlying the way the data was analyzed, the number of subjects participating in this study, the instruments which were used and the way in administering those instruments, as well as the way the data were analyzed. These are respectively presented in time and place of the study, research design, population and sample, research instrument, technique of data collection, and technique of data analysis.

A. Time and Place of the Study

This study was carried out from April to June 2014 at Department of English Education of Syarif Hidayatullah State Islamic University Jakarta.

B. Research Design

A correlational design, included as a quantitative research, was used in this study. It was employed to find out and measure the relationship between two variables covering an independent variable (critical thinking ability) and a dependent variable (writing ability) by using a correlational analysis.

C. Population and Sample

The population of this study was all the students in the sixth semester of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta, academic year 2013/2014. The sixth semester students were decided as the participants of this study due to a consideration that they had the adequate knowledge related to the writing skill because they had already attended several writing courses in Department of English Education. In addition, the sixth semester students were spread into three classes, i.e. VI A, B, and C, in which there were about 40 students in each class. The total of the population was 121 students. From the three classes, there were only 60 students who involved and

participated as the sample of this study which were taken from class VI A and B. They were determined as the sample of this study by using purposive sampling technique since class VI C had taken part in the instrument try-out.

D. Research Instrument

The kinds of instruments used were tests encompassing:

1. Critical Thinking Test

   The number of the critical thinking test items comprises 37 questions in the form of multiple choices having two to five alternatives. The scheme and test specification of this test follows and are similar to the *Watson-Glaser Critical Thinking Appraisal*®. There are five sections included in this test consisting of inferences, assumptions, deductions, interpreting information, and arguments (see the instrument specification in Appendix 1). The tryout of critical thinking test was conducted to some students who had the same level as the targeted participants of this study. Based on the instrument try-out result, it shows that the score of this test validity is various shown by the discrimination index (DI) from 0.11 to 0.67. From the 37 items, there are 17 items included as the good or valid ones since these pass the threshold score of validity (DI > 0.30), whereas the remaining test items of which DI= 0.11−0.29 were revised before these were administered to the targeted participants (see Appendix 5). Besides, the reliability of this test, measured by using Kuder-Richardson (KR-20) equation, indicates a fairly high reliability that is shown by the reliability score 0.60 (see Appendix 6);

2. Test of Written English (Independent Essay)

   This test is provided to find out the students' writing ability. There are four topics to develop by the participants in this test. The topics are taken from TOEFL®. Additionally, the analytic scoring is used to assess the students' writing ability.

E. Technique of Data Collection

Before the data were collected, the researcher firstly made sure that he got the consent and agreement to conduct this study to Department of English Education as well as the consent to the participants about the time on which they could take part in this study. The test battery of this study is chronologically portrayed as follows:

1. Test Battery of Critical Thinking Test
    a. First, the participants' identities which comprises student's name, student's register number (*NIM/Nomor Induk Mahasiswa*), and student's signature were taken. They were asked to fill the attendance list that covered those participants' personal identities;
    b. Next, as the participants had already completed writing their identities on the attendance list, they were informed about the instructions related to the critical thinking test, and then when they were ready to do the test, the researcher started to time and watch the test taking place;
    c. The participants were asked to answer all the questions consisting of 37 items related to critical thinking on the answer sheet provided around 30 minutes;
    d. After the participants completed this test, their answer sheets were rated and their result were analyzed;
2. Test Battery of Test of Written English (Independent Essay)
    a. The test of written English was administered exactly after the participants had already finished doing the critical thinking test. It was conducted simultaneously in the same day and occasion as critical thinking test;
    b. Next, the participants were informed both about the instruction to do this test and about the scoring criteria of their writing response;
    c. The participants were freely to choose only one of the four topics given;
    d. The participants were asked to do this test around 30 minutes with a condition that their writing should be approximately 300-350 words length;

e. After the participants had already finished this test, their responses were copied to be rated by two raters. The first rater is an English teacher who had an experience in conducting a research on writing ability, whereas the second rater is the writer/researcher himself who is currently taking Bachelor degree at Department of English Education of Syarif Hidayatullah State Islamic University Jakarta.

F. Technique of Data Analysis

To analyze the data, the Pearson Product Moment correlation was employed. In addition, computer software such as Microsoft Office Excel 2007 and SPSS version 18.0 were utilized to assist the writer in analyzing the data of this study.

G. Statistical Hypothesis

The non-directional (two-tail) test was used in terms of the statistical hypotheses, which is presented as follows:

1. H_0 : r = 0 or if $r_{xy} < rt$, H_0 is accepted, and H_a is rejected;
2. H_a : r ≠ 0 or if $r_{xy} > rt$, H_a is accepted, and H_0 is rejected.

CHAPTER IV
RESEARCH FINDINGS AND DISCUSSIONS

This chapter reports and discusses the research findings from the data that had been already collected. The findings and discussions are elaborated in data description, testing hypotheses, research discussions, and limitations or challenges that were found as the research was being conducted.

A. Data Description

1. Critical Thinking Ability Data

The critical thinking ability of the sixth semester students of Department of English Education is determined by calculating the number of the correct responses in the critical thinking test. This is illustrated in Figure 4.1 as follows:

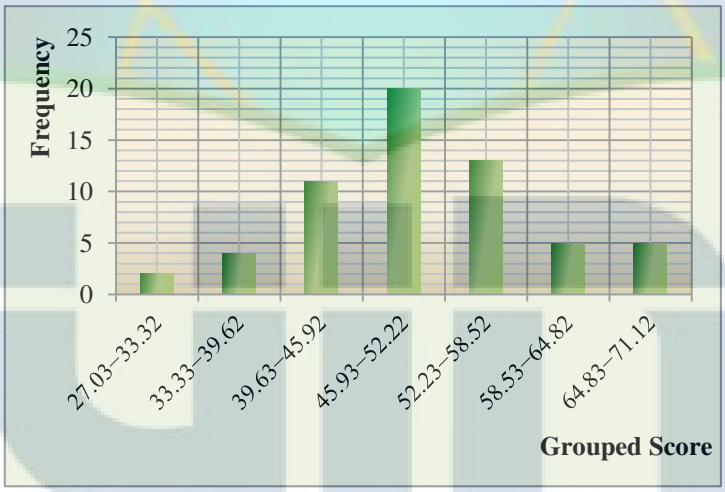

Figure 4.1
Histogram of Frequency Distribution of Critical Thinking Ability

Figure 4.1 above reveals that from 60 participants conducting the critical thinking test, the most frequently occurring scores (Mode) are at the grouped score (or interval score) 45.93−52.22 with 20 participants. Besides, 5 participants are found to have the highest score indicated by the last highest interval score 64.83−71.12, and 2 participants are in the last lowest interval score 27.03−33.32.

Moreover, the description of the critical thinking ability data is described in detail in Table 4.1 as follows:

Table 4.1
Descriptive Statistics of Critical Thinking Ability Data

Mode	51.35
Median	51.35
Mean	50.14
Minimum	27.03
Maximum	70.27
Range	43.24
Semi-interquartile Range	13.51
Standard Deviation	8.99
Variance Coefficient (%)	17.82
Skewness	-0.11
Standard Error of Skewness	0.31
Skewness Ratio	-0.35
Kurtosis	-0.09
Standard Error of Kurtosis	0.61
Kurtosis Ratio	-0.14

Based on Table 4.1 above, the central tendency distribution of critical thinking ability data of the 60 sixth semester students Department of English Education is indicated by the mode, mean, median, minimum, and maximum scores. In this case, it is found that the most frequently score (Mode) of critical thinking ability data is 51.35. Next, the middle point in the data distribution (Median) found is 51.35. Besides, the average score is shown by the Mean score 50.14. Meanwhile, the lowest score (Minimum) obtained is 27.03, and the highest score (Maximum) found is 70.27.

In addition, the dispersion or variability distribution of critical ability data is shown by the scores of range, semi-interquartile range, standard deviation, variance coefficient, skewness, and kurtosis. First, based on Table 4.1 represented above, the range score between maximum and minimum scores found is 43.24. The next indicator of variability which is based on the range of the middle 50 percent of the test scores is shown by the semi-interquartile range score 13.51. Besides, the standard deviation score found is 8.99. Meanwhile, the percentage of the comparison between standard deviation and the mean scores is shown by the coefficient variance 17.82. Next, the dispersion shape of the data distribution is indicated by skewness and kurtosis scores found respectively are -0.11 and -0.09 (both of these scores indicates that the shape of data dispersion is slightly-left

skewed and peaked. It is interpreted as a reasonably normal distribution for the skewness ratio (-0.35) and kurtosis ratio (-0.14) are included in the reasonably accepted score of normal data distribution, i.e. between -2 and 2).

Furthermore, to provide an additional vivid description of the data distribution of the critical thinking ability data, Figure 4.2 gives the histogram of frequency distribution with the probability normal curve formed as follows:

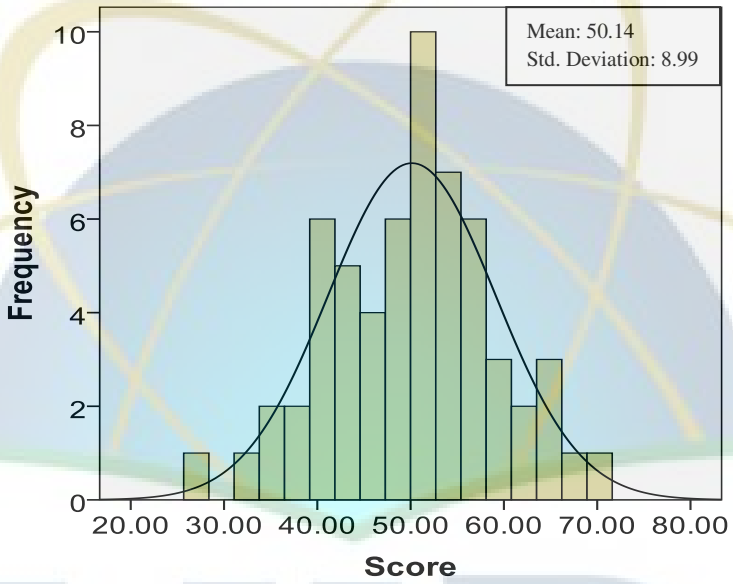

Figure 4.2
Histogram with Normal Curve of Critical Thinking Ability Data

Apparently, Figure 4.2 shows that critical thinking ability data is normally distributed. This is indicated by the histogram which resembles the symmetrical and bell-shaped graphical representation.

2. Writing Ability Data

The writing ability of the sixth semester students of Department of English Education is determined from the students' responses in the test of written English (independent essay) which were rated by two raters. Table 4.2 below describes the comparison scores of the writing ability rated by the first rater and the second rater as follows:

Table 4.2
Descriptive Statistics of Writing Ability Data of Rater 1 and Rater 2

	Rater 1	Rater 2
Mode	73.00	74.00
Median	73.50	67.00
Mean	74.77	67.02
Minimum	58.00	42.00
Maximum	90.00	87.00
Range	32.00	45.00
Semi-interquartile Range	6.75	13.75
Standard Deviation	6.46	9.43
Variance Coefficient (%)	8.64	14.07
Skewness	0.56	-0.32
Standard Error of Skewness	0.31	0.31
Skewness Ratio	1.81	-1.03
Kurtosis	0.48	-0.02
Standard Error of Kurtosis	0.61	0.61
Kurtosis Ratio	0.79	-0.03

Based on Table 4.2 represented above, in terms of the central tendency of data distribution between the two raters, the most frequently scores of the first and the second rater found respectively are 73.00 and 74.00. Next, it is found that the median and mean scores of the first rater is higher than the second rater (Median=73.50>67.00 and Mean=74.77>67.02). Similarly, the higher scores are also found in the first rater in the case of the minimum and maximum scores in comparison to the minimum and maximum scores of the second rater (Minimum=58.00>42.00 and Maximum=90.00>87.00).

In addition, according to Table 4.2, the variability of data distribution between the first and second raters also encounters some various scores. First, the first rater is found to have the lower range score than the second rater (32.00<45.00). Meanwhile, it is found that the semi-interquartile obtained from the first rater is lower than the second rater (6.75<13.75). Also, the standard deviation and variance coefficient of the first rater is found to have the lower score than the second rater (Standard Deviation=6.46<9.43 and Variance Coefficient=8.64% < 14.07%), which mean that the writing ability data set of the first rater is more homogenous than the second rater. Besides, the data distribution

of the first rater is slightly right-skewed (0.56) and peaked (0.48), whereas the second rater is slightly left-skewed (-0.32) and peaked (-0.02). In addition, the skewness ratio (1.81, -1.03) and kurtosis ratio (0.79, -0.03) of the two raters' score are between -2.00 and 2.00, which mean that the data have a fairly normal distribution.

Next, Figure 4.3 and Figure 4.4 below give an additional illustration of the data distribution of the writing ability data sets of the first and second raters through the histogram of frequency distribution with the probability normal curve formed as follows:

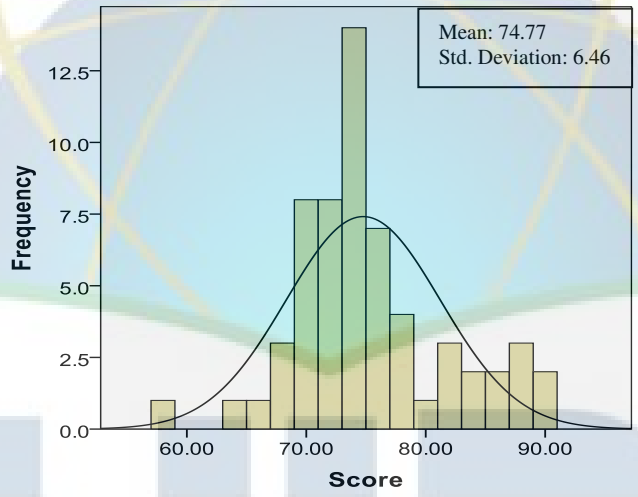

Figure 4.3
Histogram with Normal Curve of Writing Ability Data of Rater 1

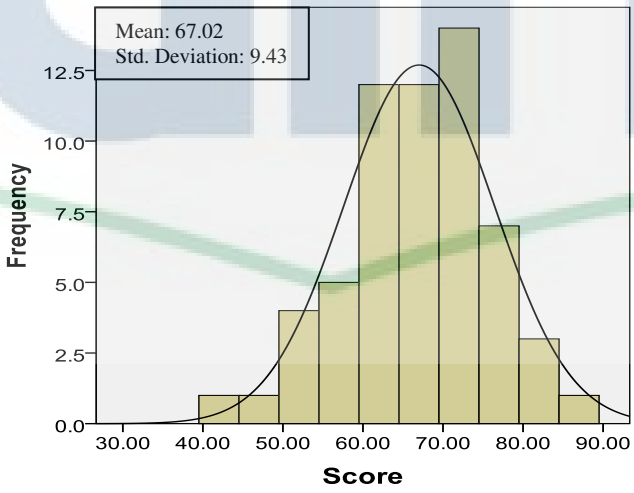

Figure 4.4
Histogram with Normal Curve of Writing Ability Data of Rater 2

By examining Figure 4.3 and Figure 4.4 presented above, the writing ability data sets of the two raters clearly form a symmetrical and bell-shaped curve, which mean that the data are normally distributed.

Furthermore, the inter-rater reliability is used in terms of the writing ability data since every single participant's writing response was rated by two different raters. In this case, before the inter-rater reliability is measured, the linearity and normality distribution of each data set from the two raters are tested first as a condition to determine what kind of analysis should be used to find out the coefficient correlation, indicating the inter-rater reliability, between the two raters. The test of linearity and normality distribution are described as follows:

a. Test of Linearity

The linearity of the writing ability data set of the first rater and the second rater is found out through examining the scattered diagram depicted in Figure 4.3 as follows:

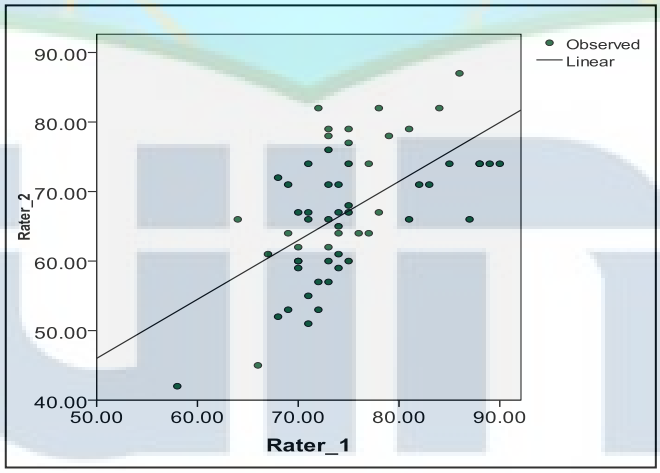

Figure 4.5
Scattered Diagram of the Linearity between Rater 1 and Rater 2

The scattered diagram in Figure 4.3 above reveals that the scores given by the first rater and the second rater tend to have a linear relationship as the dots in that diagram shows an indication as a linear line. Next, the scores given by the first rater and the second rater tend to have a fairly relationship since most of the dots in that diagram are fairly close to the line which can be drawn from the dots. Besides, it can be assumed that there is a positive relationship between the score

data from the first rater and the second rater for the dots in that scattered diagram shows an indication that the data starts from the down left side to the up right side of the diagram.

In addition, to have more accurate investigation of the linearity between the first rater and the second rater, the analysis of variance (ANOVA) is conducted. The result of ANOVA between the two raters is presented as follows:

Table 4. 3
ANOVA[b] between Rater 1 and Rater 2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	830.611	1	830.611	29.553	0.000[a]
	Residual	1630.122	58	28.106		
	Total	2460.733	59			

a. Predictors: (Constant), Rater_2

b. Dependent Variable: Rater_1

Based on Table 4.3 above, the F-Test value obtained is 29.553 with level of significance or p-value at 0.000. Due to the fact that the p-value is lower than the 95% and 99% levels of confidence (0.000<0.050, 0.000<0.010), it can be considered that the regression model between the two raters is linear.

b. Test of Normality Distribution

The normality distribution is tested based on two approaches as follows:

1. Graphical Approach

Although Figure 4.3 and 4.4 may have already considered to be used as the graphical approach representation depicting that the writing ability data sets of the two raters are normally distributed, in which the histogram represented in Figure 4.3 and 4.4 resemble a symmetry and bell shape, to more ensure the normality distribution have been met, some further inspections through employing other charts which are commonly used in terms of graphical approach may be necessarily provided. In this case, the whisker-and-box plot and Q-Q (Quantile-Quantile) plot are employed to examine the normality distribution of the data set from each rater as follows:

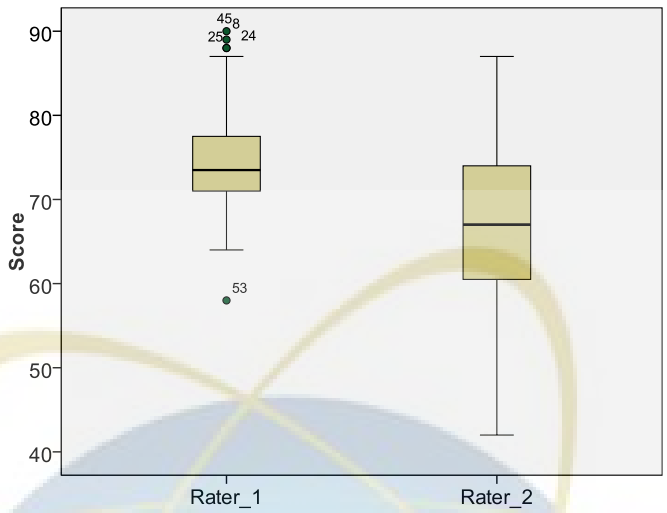

Figure 4.6
Whisker-and-Box Plots of Rater 1 and Rater 2

By examining the whisker-and-box plots illustrated in Figure 4.6 above, the data distributions of the two raters are fairly normal (symmetrical) indicated by the height of the box and the height of the whisker lines. Besides, the same description as revealed in the descriptive statistics in Table 4.2 is also found in Figure 4.6 above; in this case, the first rater has the higher median score than the second rater, shown by the middle horizontal line of the box. Also, according to the whiskers shown by the lines above and below the box, the first rater has the higher minimum and maximum scores than the second rater. Next, the second rater has the higher semi-interquartile range and considered as having a higher variability (standard deviation), indicated by the length of the box. Although, the two raters' data distributions look fairly normal, the first rater has several extreme scores (participant 53, 25, 24, 8, and 45). To judge whether these extreme scores are extreme cases/outliers (cause for exclusion the participants to the calculation of correlation coefficient) or facilitating cases (the participants can still be retained to the calculation of correlation coefficient), these will be confirmed by Q-Q plots of the two raters as follows:

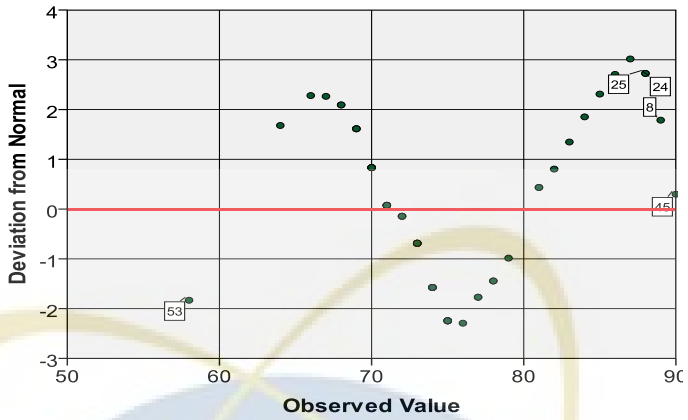

Figure 4.7
Detrended Normal Q-Q Plot of Rater 1

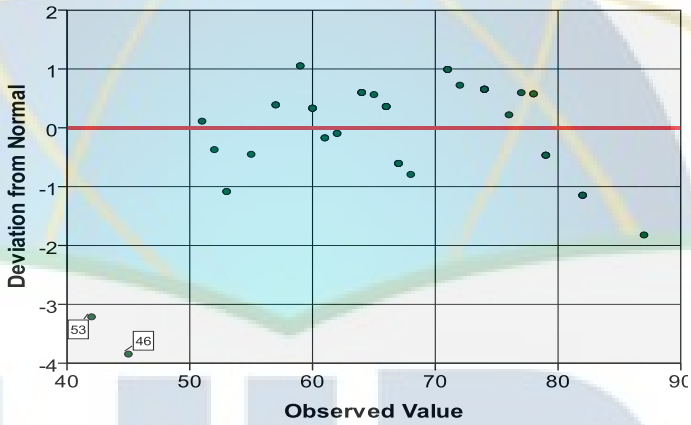

Figure 4.8
Detrended Normal Q-Q Plot of Rater 2

Based on the detrended normal Q-Q plot of Rater 1 represented in Figure 4.7 above, the extreme scores (participants 53, 25, 24, 8, and 45) which are shown in the whisker-and-box plot illustrated in Figure 4.6 cannot be considered to be the outliers since they are still within the acceptable range of standard deviation (i.e. between -3 and 3), instead they should be considered as the facilitating cases included to the calculation of coefficient correlation. Unexpectedly, in the detrended normal Q-Q plot of Rater 2 presented in Figure 4.8, the participants (53 and 46) appear as having more than three of standard deviations from the mean. However, by comparing the scores of the participants (53 and 46) given by the two raters (see Appendix 8), and also by reexamining the participants' writing responses on the answer sheets, they

should not be treated as the outliers since the participant 53 and 46 indeed poorly perform in the written test of English (independent essay).

2. Numerical Approach

The numerical approach is used to test the data normality distribution as a companion and a confirmation of the interpretation of graphical approach previously. By using the numerical approach, the data normality distribution can be estimated and calculated precisely. The descriptive statistics represented in Table 4.2 above has already contained the necessary information related to normality test. The Table 4.2 reveals that based on the skewness ratio (1.81, -1.03) and kurtosis ratio (0.79, -0.03), the data sets of the two raters can be regarded as a normal distribution since these are within the reasonably accepted range score (between -2.00 and 2.00). Although, according to the graphical approach, in which the whisker-and-box plot has informed that there are some extreme scores in the data set deriving from the first rater (Figure 4.6), as well as based on the detrended normal Q-Q plot which shows the data set of the second rater has also several extreme scores (Figure 4.8), by examining the numerical approach (using the skewness ratio and kurtosis ratio), the assumption of normal distribution of the data sets from the two raters have met the requirement in which the two raters' data sets are normally distributed. In addition, in order to have more accurate results of the normality distribution of the data sets of the two raters, another inspection of numerical approach (the Shaphiro-Wilks W test) is employed. Next, the hypotheses related to the normality distribution of the writing ability data sets of the first rater and the second rater that are tested by Shaphiro-Wilks W test as follows:

a. Null hypothesis (H0): writing ability data sets of the first rater and the second rater are normally distributed;
b. Alternative hypothesis (Ha): writing ability data sets of the first rater and the second rater are not normally distributed;

or in terms of statistical hypotheses:

a. H0: F(x)=F0(x), if p>0.05 or p>0.01, H0 is accepted;

b. Ha: F(x) ≠ F0(x), if p<0.05 or p<0.01, H0 is rejected.

The results are provided in Table 4.4 as follows:

Table 4.4
Inferential Normality Distribution Test of Rater 1 and Rater 2

	Shaphiro-Wilks W	**Asymp. Sig. (2-tailed) (p)**	**95% level of confidence (p>0.05)**	**99% level of confidence (p>0.01)**
Rater 1	0.94	0.04	0.04<0.05	0.04>0.01
Rater 2	0.98	0.62	0.62>0.05	0.62>0.01

Based on Table 4.4 above, at the 99% of level of confidence (p>0.01), it appears to be no problem regarding to the normality distribution. In this case, the test shows that the asymptotic significance of the two raters obtained is higher than the 99% level of confidence (rater 1=0.04>0.01, rater 2=0.62>0.01), so H0 is accepted. In other words, the writing ability data sets of the first rater and the second rater are normally distributed. However, inconsistency result of the first rater's data set is found as the level of significance is lowered to the 95% level of confidence. It is found that the first rater's asymptotic significance is lower than the 95% level of confidence (0.04<0.05); thus, H0 is rejected. Consequently, the writing data set of the first rater is considered as not normally distributed. Meanwhile, at the 95 % level of confidence, the data distribution of the second rater is found to be consistent (p>0.05 or 0.62>0.05); therefore, H0 is accepted. In other words, the second rater's data set is normally distributed.

To reach the decision of the normality distribution of the two raters, all the normality methods are compared. The result summary of each method is compared as follows:

Table 4.5
Comparison of Normality Distribution Test Results between Skewness-Kurtosis Ratios and Shaphiro-Wilks W Test of Rater 1 and Rater 2

	Skewness-Kurtosis Ratios	**Shaphiro-Wilks Test**	
		p>0.05	p>0.01
Rater 1	Normal	Not Normal	Normal
Rater 2	Normal	Normal	Normal

Table 4.5 presented above indicates that there is only one result/condition in which the data set is not normal, namely the first rater's data set tested by Shaphiro-Wilks W test at the 95% level of confidence (or $p>0.05$). Meanwhile, the remaining test results for the two raters have the normal distribution.

By examining the normality distribution test results above, the evaluation for the risks to create errors in hypothesis testing to coefficient correlation indicating the inter-rater reliability is necessary to considered. Firstly, a type I error is feasible to create since the 95% level of confidence ($p>0.05$) has a higher chance to reject the null-hypothesis which states that the data is not normally distributed, in fact in reality the data distribution is normal. Meanwhile, a type II error is likely to occur as the level of confidence is increased to 99% in which the null hypothesis is accepted (the data is considered as normally distributed), in fact in reality the data is not normally distributed. Despite having the possibility to make a type I error or a type II error, the parametric statistics (Pearson Product Moment correlation) is preferred to be used since this takes some considerations the first rater's data set is considered to be normally distributed due to the fact that its skewness and kurtosis ratios (1.81 and 0.79) are reasonably normal and the represented histogram resembles a symmetrical and bell-shaped graphical representation (Figure 4.3), as well as confirmed by the result of the Shaphiro-Wilks W test at the 99% level of confidence.

Next, after determining that each writing ability data set of the first rater and the second rater tends to be linear and is normally distributed, the calculation of the inter-rater reliability of the writing ability is continued to measure the correlation coefficient by using Pearson Product Moment correlation. Based on the calculation of the inter-rater reliability between the two raters, the score of the inter-reliability (r_{y1y2}) obtained is 0.58 (see Appendix 14). Then, it is compared with the score of *r table* (*rt*) at the levels of significance 0.05 and 0.01 (α=5% and α=1%). With df=58, the $rt_{(5\%)}$ and $rt_{(1\%)}$ obtained respectively are 0.26 and 0.34 (with interpolation) (see Appendix 16). Therefore, the score of the inter-rater

reliability is higher than the score of the *r table* at the levels of significance 0.05 and 0.01, or r_{y1y2}=0.58>$rt_{(5\%)}$=0.26 and r_{y1y2}=0.58>$rt_{(1\%)}$=0.34. In other words, there is any significant relationship between the writing ability data set rated by the first rater and the second rater. Hence, it can be considered that the writing ability scores rated by the two raters are interchangeable.

Moreover, the final score of the writing ability data is shown in Figure 4.9 as follows:

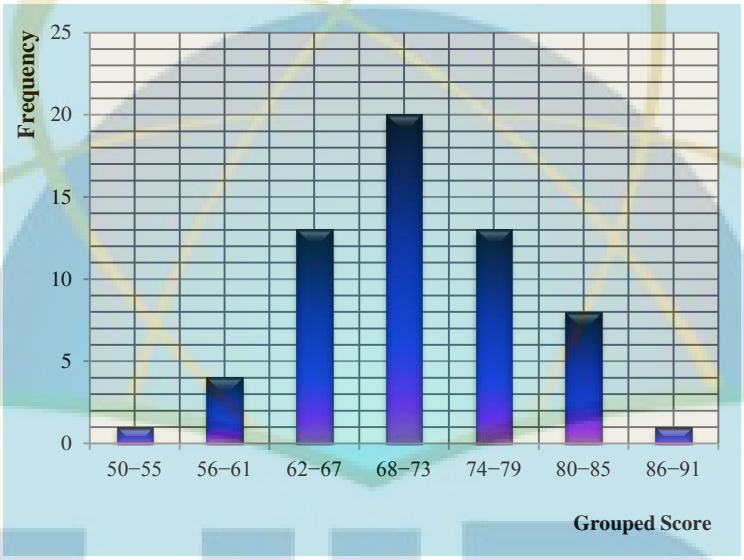

Figure 4.9
Writing Ability Data (Final Score)

Figure 4.9 above illustrates the final score of the writing ability obtained from the average score between the first rater and the second rater. In this case, it reveals that from the test of written English (independent essay) conducted by the 60 participants, the most frequently score found is shown by the interval score 68-73 of which participants are 20. Besides, 1 participant is found to have the highest score within the interval score 86-91, and similarly there is 1 participant included into the lowest interval score 50-55 found.

In addition, Table 4.6 below gives the detail description of students' writing ability data as follows:

Table 4.6
Descriptive Statistics of Writing Ability Data (Final Score)

Mode	65.00
Median	70.25
Mean	70.89
Minimum	50.00
Maximum	86.50
Range	36.50
Semi-interquartile Range	10.25
Standard Deviation	7.10
Variance Coefficient (%)	10.02
Skewness	-0.24
Standard Error of Skewness	0.31
Skewness Ratio	-0.77
Kurtosis	0.27
Standard Error of Kurtosis	0.61
Kurtosis Ratio	0.44

Based on Table 4.6 above, in terms of the central tendency distribution, the final score of the writing ability of the 60 sixth semester students of Department of English Education averagely is 70.89. Next, the most frequently score found is 65.00. Meanwhile, the middle score obtained is 70.25. Besides, the lowest score found is 50.00, and the highest score found is 86.50.

In addition, in terms of the variability distribution of the final score of the writing ability data, the range score between maximum and minimum scores found is 36.50. Next, the semi-interquartile range obtained is 10.25. With standard deviation score 7.10 and variance coefficient 10.02 percent, the skewness and kurtosis scores found respectively are -0.24 (slightly left-skewed) and 0.27 (peaked).

Moreover, to provide an additional vivid description of the writing ability data, Figure 4.10 presents a histogram of frequency distribution with the probability normal curve as follows:

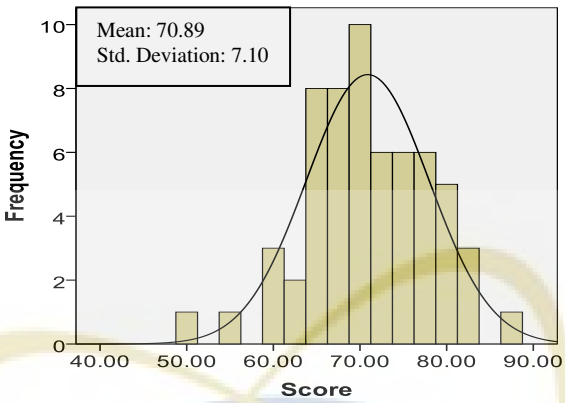

Figure 4.10
Histogram with Normal Curve of Writing Ability Data (Final Score)

Figure 4.10 reveals that the final score of writing ability data has a normal distribution since the histogram of the frequency distribution resembles a symmetrical and bell-shaped graphical representation.

B. Data Analysis and Testing Hypotheses

1. Data Analysis

Before the data is analyzed, the linearity and normality distribution of the data sets of the two variables (critical thinking ability and writing ability) are tested first. The explanation of test of linearity and normality distribution are presented as follows:

a. Test of Linearity

The linearity of the critical thinking ability and writing ability data sets is tested through examining the scattered diagram represented in Figure 4.11 as follows:

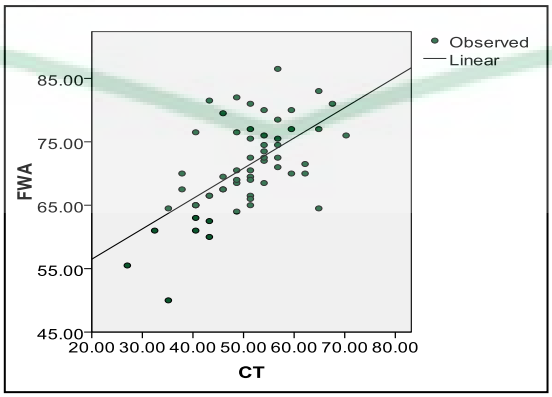

Figure 4.11
Scattered Diagram of the Linearity between CT and FWA

The scattered diagram presented in Figure 4.11 above reveals that the CT (Critical Thinking) ability and FWA (Final score of Writing Ability) tend to have a linear relationship as the dots in that diagram shows an indication as a linear line. Also, critical thinking ability and writing ability tend to have a fairly relationship since the dots in that diagram are close to the line which can be drawn from the dots. Moreover, it can be estimated that there is a positive relationship between the critical thinking ability and writing ability for the dots in that scattered diagram shows an indication that the data starts from the down left side to the up right side of the diagram.

Besides, the result of the scattered diagram represented in Figure 4.11 above is also confirmed by the result of ANOVA between the two variables as follows:

Table 4.7
ANOVA[b] between CT and FWA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1088.739	1	1088.739	33.565	0.000[a]
	Residual	1881.307	58	32.436		
	Total	2970.046	59			

a. Predictors: (Constant), CT

b. Dependent Variable: FWA

Table 4.7 above reveals that F-test value is 33.565 with p-value obtained is 0.000. Because the p-value is lower than both at 95% and 99% the level of confidence (0.000<0.050, 0.000<0.010), the regression model between CT and FWA is considered linear.

b. Test of Normality Distribution

The normality distribution of critical thinking ability and writing ability data is tested through graphical approach and numerical approach as follows:

1. Graphical Approach

According to Figure 4.2 and 4.10, the critical thinking ability data set and writing ability data set have been regarded as a normal distribution since the histograms represented in Figure 4.2 and 4.10 have some resemblance to the symmetrical and bell-shaped curve. Nevertheless, drawing some comparisons

between histogram and probability normal curve represented in Figure 4.2 and 4.10, the whisker-and-box plot as well as the Q-Q plot are also necessarily provided in order to have a more accurate depiction of the normality distribution of each data set. The whisker-and-box plot and Q-Q plot are presented as follows:

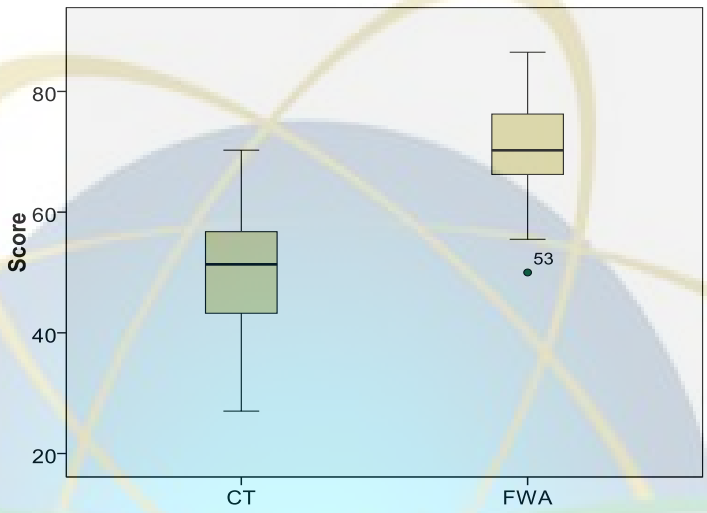

Figure 4.12
Whisker-and-Box-Plot of CT and FWA

Figure 4.12 above shows that CT ability and the FWA data sets can be considered to be normally distributed (symmetrical) shown by the boxes and whisker lines of the two data sets. Besides, Figure 4.12 also reveals that FWA data set has a higher middle score (median) indicated by the middle line of the box. In addition, the FWA has also a higher maximum and minimum score shown by the upper end and lower end horizontal lines of the whiskers lines located higher than CT. Moreover, by comparing the two data sets' length of boxes, the CT data set is considered to have a higher semi-interquartile range than FWA; thus, the CT data also has higher standard deviation which means that CT data is more heterogeneous than FWA. Besides, there is an extreme score (indicated by participant 53) found in the FWA data set. However, by considering and comparing the scores between CT and FWA, it is not found that there is any invalid measure deriving from the data of the participant 53. Thus, he/she should not be treated as an outlier since he/she poorly performs on the two tests. As a

result, the participant 53 can still be retained to the calculation of coefficient correlation later.

Another graphical inspection of the normality distribution between the two data sets is through examining the Q-Q plots as follows:

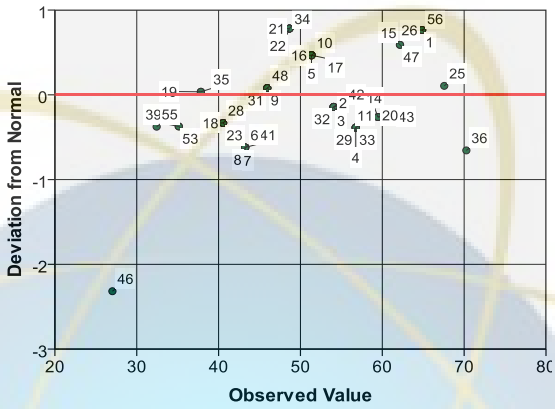

Figure 4.13
Detrended Normal Q-Q Plot of CT

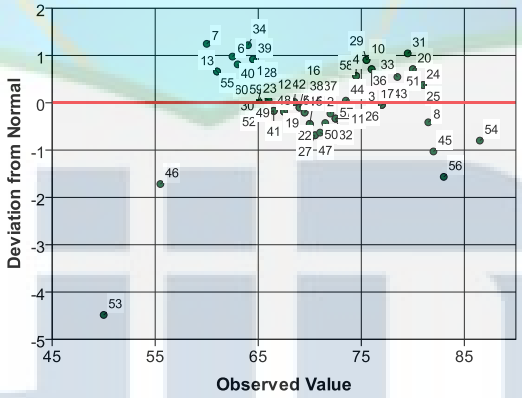

Figure 4.14
Detrended Normal Q-Q Plot of FWA

Based on the detrended normal Q-Q plot represented in Figure 4.13, there are no any significant outliers—moving away from more than the accepted range (three standard deviations from the mean)—that can be found. Meanwhile, Figure 4.14 indicates that the participant 53 is found to locate more than three standard deviations. Nevertheless, by carefully reexamining the data processing trail, including the inspection of the participant's answer sheets on the two tests (test of written English and CT test) and comparing the scores between the two tests, the participant 53 had indeed been found to have poorly performed in the two tests

due to his/her lack of ability in conducting the two tests. Therefore, the participant 53 should not be excluded from the calculation of coefficient correlation.

2. Numerical Approach

The same as numerical approach conducted to test the normality distribution of data sets previously (i.e. the first rater and the second rater data sets), the normality distribution of CT and FWA data sets are also tested by using the numerical approach to present a more accurate and objective judgment of the normality distribution of the two data sets between CT and FWA and to justify the interpretation of graphical approach conducted previously. In this case, based on the skewness ratio (-0.35, -0.77) and kurtosis ratio (-0.14, 0.44), the CT and FWA data sets are considered as having a normal distribution since these are still within the accepted range score, between -2 and 2 (see Table 4.1 and Table 4.5). Furthermore, to have more accurate result, the Shaphiro-Wilks W test is employed as well. The drawn hypotheses related to normality distribution of CT and FWA as follows:

a. Null hypothesis (H0): the CT and FWA data sets are normally distributed;
b. Alternative hypothesis (Ha): the CT and FWA data sets are not normally distributed,

or in terms of statistical hypotheses:

a. H0: F(x)=F0(x), if $p>0.05$ or $p>0.01$, H0 is accepted;
b. Ha: F(x) ≠ F0(x), if $p<0.05$ or $p<0.01$, H0 is rejected.

The results are summarized in Table 4.8 as follows:

Table 4.8
Inferential Normality Distribution Test of CT and FWA

	Shaphiro-Wilks W	**Asymp. Sig. (2-tailed) (*p*)**	**95% level of confidence** ($p>0.05$)	**99% level of confidence** ($p>0.01$)
CT	0.99	0.81	0.81>0.05	0.81>0.01
FWA	0.99	0.74	0.74>0.05	0.74>0.01

Based on Table 4.8 presented above, the CT and FWA data sets have higher asymptotic significance than both at the 95% level of confidence (0.81>0.05, 0.74>0.05) and 99% level of confidence (0.81>0.01, 0.74>0.01). As a

result H0 is accepted. Thus, it can be considered that the CT and FWA data sets are normally distributed.

In addition, to provide a clear decision, each method of numerical approach of the normality distribution test is compared as follows:

Table 4.9
Comparison of Normality Distribution Test Results between Skewness-Kurtosis Ratios and Shaphiro-Wilks W Test of CT and FWA

	Skewness-Kurtosis Ratios	**Shaphiro-Wilks Test**	
		p>0.05	p>0.01
CT	Normal	Normal	Normal
FWA	Normal	Normal	Normal

Table 4.9 reveals that both of skewness-kurtosis ratios method and Shaphiro-Wilks W test method appear to have no problem. Consequently, the data sets of CT and FWA are considered as a normal distribution.

Due to the fact that both of the data sets of critical thinking ability and writing ability tends to be linear and are normally distributed, the parametric statistic (in this case Pearson Product Moment correlation) can be used to find out the correlation coefficient between critical thinking ability and writing ability. The correlation coefficient for both of the variables is symbolized with r_{xy}. The calculation of r_{xy} is presented in details as follows:

N = 60
$\sum$x = 3008.11
$\sum$y = 4253.50
$\sum$xy = 215528.37
$\sum x^2$ = 155580.70
$\sum y^2$ = 304507.75

$$rxy = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{(N \sum_x 2 - (\sum x)^2)(N \sum_y 2 - (\sum y)^2)}}$$

$$= \frac{60\ (215528.37) - (3008.11)(4253.50)}{\sqrt{(60(155580.70) - (3008.11)^2)(60(304507.75) - (4253.50)^2)}}$$

$$= \frac{12931702.20 - 12794995.89}{\sqrt{(9334842 - 9048725.77)(18270465 - 18092262.25)}}$$

$$= \frac{136706.31}{\sqrt{(286116.23)(178205.75)}}$$

$$= \frac{136706.31}{\sqrt{50987557354.32}}$$

$$= \frac{136706.31}{225804.25}$$

rxy = 0.605 ≈ 0.61

(Note: the scores of N, ∑x, ∑y, ∑xy, $\sum x^2$, $\sum y^2$ above are taken from Appendix 15).

In addition, to know the contribution of variable x (critical thinking ability) towards variable y (writing ability), the determination coefficient (r^2) is measured. The detail calculation of r^2 is presented as follows:

$r^2 = (r_{xy})^2$ x 100

$=(0.61)^2$ x 100

=0.3721 x 100

r^2=37.21

Furthermore, the regression analysis is conducted to estimate the value of one variable through the other variable. The regression equation comprises $\hat{Y}$=a+bX. To get the $\hat{Y}$=a+bX equation, the values of *a* and *b* are examined. The detail calculations of the values of *a* and *b* are presented in detail as follows:

N = 60
∑x = 3008.11
∑y = 4253.50
∑xy = 215528.37
$\sum x^2$ = 155580.70
$\sum y^2$ = 304507.75

$$a = \frac{(\sum y)\,(\sum x 2) - (\sum x)(\sum xy)}{N(\sum x 2) - (\sum x)^2}$$

$$= \frac{(4253.50)\,(155580.70) - (3008.11)(215528.37)}{60(155580.70) - (3008.11)^2}$$

$$= \frac{661762507.45 - 648333045.08}{9334842 - 9048725.77}$$

$$= \frac{13429462.37}{286116.23}$$

a=46.937 ≈ 46.94

$$b = \frac{N(\sum xy) - (\sum x)(\sum y)}{N(\sum x 2) - (\sum x)^2}$$

$$= \frac{60(215528.37) - (3008.11)(4253.50)}{60(155580.70) - (3008.11)^2}$$

$$= \frac{12931702.20 - 12794995.89}{9334842 - 9048725.77}$$

$$=\frac{136706.31}{286116.23}$$

b=0.477≈0.48

(Note: the scores of N, ∑x, ∑y, ∑xy, $\sum x^2$, $\sum y^2$ above are taken from Appendix 15).

From the calculation of the value *a* and *b* above, the regression equation obtained is $\hat{Y}$= 46.94 + 0.48X.

2. Testing Hypotheses

This study is to answer the following hypotheses:

a. Null hypothesis (H_0): there is no any significant relationship between critical thinking ability and writing ability;
b. Alternative hypothesis (H_a): there is any significant relationship between critical thinking ability and writing ability,

or in terms of the statistical hypotheses, these can be portrayed as follows:

a. H_0 : ρ = 0 or if $r_{xy} < rt$, H_0 is accepted, and H_a is rejected;
b. H_a : ρ ≠ 0 or if $r_{xy} > rt$, H_a is accepted, and H_0 is rejected.

According to the research findings, the calculation of r_{xy} obtained is 0.61. Then, the score r_{xy}=0.61 is compared with r table (rt) at the level of significance 0.05 (α=5%) and the level of significance 0.01 (α=1%). With df=58, the $rt_{(5\%),(58)}$ gained is 0.26 (with interpolation), and the $rt_{(1\%),(58)}$ obtained is 0.34 (with interpolation) (see Appendix 16). Therefore, r_{xy}=0.61>$rt_{(5\%),(58)}$=0.26, and r_{xy}=0.61>$rt_{(1\%),(58)}$=0.34. As a result, H_a is accepted, and H_0 is rejected, which means there is any significant relationship between critical thinking ability and writing ability.

In addition, to generalize the result of r_{xy} above to the population, the significance of correlation coefficient should be tested by t-test to see whether ρ=0 or ρ≠0. The calculation of *t-test* is presented in details as follows:

r=0.61

N=60

df=58

$$t=\frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$$=\frac{0.61\sqrt{60-2}}{\sqrt{1-(0.61)^2}}$$

$$=\frac{0.61\sqrt{58}}{\sqrt{1-0.3721}}$$

$$=\frac{0.61(7.62)}{\sqrt{0.6279}}$$

$$=\frac{4.6482}{0.792}$$

t=5.868 ≈5.87

The score of *t*=5.87 obtained is compared with the score of *t table* (t_t) at levels of significance 0.05 and 0.01 (α=5% and α=1%). With df=58, the t_t at the levels of significance 0.05 and 0.01 obtained respectively are 2.01 and 2.68 (with interpolation) (see Appendix 17). Therefore, t=5.87>$t_{t_{(5\%),(58)}}$=2.01 and t=5.87>$t_{t_{(1\%),(58)}}$=2.68.

Next, to determine the relationship between critical thinking ability and writing ability employed to the population is tested based on the following criteria:

a. H_0 : ρ = 0 or if $t<t_t$, H_0 is accepted, and H_a is rejected;

b. H_a : ρ ≠ 0 or if $t>t_t$, H_a is accepted, and H_0 is rejected.

Due to the fact that $t>t_{t_{(5\%)}}$and $t>t_{t_{(1\%)}}$, H_a is accepted, and H_0 is rejected. This result can be interpreted that there is any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014.

Notes:

Df(Degree of freedom) = N(Number of cases) – nr(number of research variables)

Df =60–2=58

C. Discussions

Based on the data description above, it is found that in terms of critical thinking ability, the sixth semester students of Department of English Education averagely still have poor critical thinking ability, which is indicated by the result of the average score found is 50.14. However, in terms of the writing ability, their

craft of writing is averagely fairly good. The average score the writing ability of the sixth semester students of Department of English Education found is 70.89. Meanwhile, in terms of the inter-rater reliability between the first rater and the second rater, although there is any significant relationship between the two raters, the correlation coefficient of the inter-rater reliability still indicates a moderate relationship; in this case, it is shown by the score obtained for the inter-rater reliability is 0.58.

In addition, based on the calculation and data analysis above, the score of correlation coefficient (r_{xy}) is higher than the score of r table (*rt*). In this case, the correlation coefficient found is 0.61, and this score is compared with *rt* at the levels of significance 0.05 and 0.01. The *rt* at the levels of significance 0.05 and 0.01 obtained respectively are 0.26 and 0.34. Therefore, in terms of the levels of significance 0.05 and 0.01, the score of r_{xy} is higher than the score of *rt* or $r_{xy}=0.61>\mathrm{rt}_{(5\%)}=0.26$, and $r_{xy}=0.61>\mathrm{rt}_{(1\%)}=0.34$, which mean that the alternative hypothesis (H_a) is accepted and null hypothesis (H_0) is rejected. In other words, there is any significant relationship between critical thinking ability and writing ability.

Furthermore, based on the calculation of *t-test*, the score of $t=5.87$ is higher than the score of *t table* at the levels of significance 0.05 and 0.01, or $t=5.87>t_{t(5\%)}=2.01$ and $t=5.87>t_{t(1\%)}=0.34$. This *t* result is applied to the population of this study which means that there is any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014.

Besides, the r_{xy} can also be interpreted with Table of *r* Score Interpretation presented in Table 4.10 as follows:

Table 4.10
Table of *r* Score Interpretation[1]

The *r* score	Interpretation
0.80—1.00	Very high
0.60—0.79	High

[1]Sugiyono, *Statistika untuk Penelitian*, (Bandung: Alfabeta, 2013), p. 231.

The *r* score	Interpretation
0.40—0.59	Moderate
0.20—0.39	Low
0.00—0.19	Very low

Based on Table 4.10 above the *rx* score is included in the scale between 0.60—0.79. It indicates that there is a high relationship between variable X (critical thinking ability) and variable Y (writing ability). Hence, it can be considered that the critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014 have any significant and high relationship. This result can be confirmed to what Assadi, Davatgar, and Jafari found in their research that critical thinking ability has a positive influence towards the learners' writing.[2] In addition to the relationship between critical thinking ability and the writing skill, Heffernan and Lincoln argue that learners' writing must go hand in hand with their mind and hand.[3] Therefore, students who are able to think critically of what they have written will be able to refine any ideas in their composition which lead to their attainment in writing, as what Ruggiero points out that abundance of ideas will appear and flow as critical thinking ability is employed in writing.[4]

Next, based on the regression equation $\hat{Y}= 46.94 + 0.48X$, the score of writing ability (Y) can be estimated from the score of critical thinking ability (X) that is multiplied by 0.48 and contributed by the constant 46.94. In this case, if X goes up by one, Y is predicted to go up by 0.48.

Moreover, based on the calculation of determination coefficient (r^2) obtained, critical thinking ability has the contribution 37.21% towards writing ability. In other words, the writing ability of the sixth semester students of Department of English Education in academic year 2013/2014 is influenced by 37.21% of their critical thinking ability, and it is influenced by 67.29% other factors, for instance knowledge of vocabulary, usage/grammar, and so on. As

[2]Nader Assadi, Hanieh Davatgar, Parinaz Jafari, *loc.cit.*
[3]James A. W. Heffernan and John E. Lincoln, *loc. cit.*
[4]Vincent Ryan Ruggiero, *Beyond Feelings: A Guide to Critical Thinking*, *op. cit.*, p. 22.

Hedge proposes that to write effectively, people not only should pay attention to the ideas and information they organize, but they also need to equip themselves with knowledge of grammatical devices, the word choice, and sentence structure.[5]

D. Limitations

In conducting this study, there were some challenges which lead this study to have some limitations. First, one of the instruments has very low validity; familiarity with the instrument used might be the cause of their low result in critical thinking ability as well; in this case, the instrument consists of the items of which two to five alternatives that must be answered based on the extract or passage of each item, and also it was found that as the critical thinking test was administered, even though the explicit and clear explanation of the instruction provided in the test, there were some of the participants who were still confused of the instruction of the test. The language used in the critical thinking test should also be considered, because it is possible that the low students' result of critical thinking ability may be affected by their knowledge of language, as a result any translation in the native language of the participants can be the preference as found in the *Watson-Glaser Critical Thinking Appraisal® Manual* [6], and also in the other critical thinking test, for instance *Cornell Critical Thinking Test* that was used in a study conducted by Rashid and Hasyim; in this case, they used the participants' native language, i.e. Bahasa Malaysia.[7] Therefore, any obtained implications from findings may be less accurate. In case there are several implications or generalizations drawn in this study, these may be under the assumptions that the research instrument is valid and credible. As a result, this study may be considered to tend to be explanatory in nature and it mainly provides a description of the possibilities and alternative conclusions.

In addition, some difficulties were found in terms of looking for some raters who were competent and willing to assess the 60 participants' writing

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[5]Tricia Hedge, *loc. cit.*

[6]*Watson-Glasser™ User Guide and Technical Manual UK Supervised and Unsupervised Versions 2012*, *op. cit.*, p. 1.

[7]Rosyati Abdul Rashid and Rosna Awang Hasyim, *op. cit*., p. 376.

responses. Also, there was only limited time to administer the instrument; in this case, the participants had some courses to attend as well as there were some tests they should take.

Another shortcoming found was the difficulty to access and look for some related previous studies which were done in Indonesia. Even though it was believed that there were also some studies related to the critical thinking ability and writing ability carried out in Indonesia, lacks of access to search them and only limited publication related to the studies of critical thinking ability and writing appeared to be a problem.

CHAPTER V
CONCLUSION, IMPLICATION, AND SUGGESTION

This final chapter reveals the conclusion drawn from the previous chapter, and it also provides some pedagogical implications associated with critical thinking ability and teaching of the writing skill. Besides, some suggestions in terms of students' critical thinking ability and their writing ability as well as for any further studies in the same field are discussed here.

A. Conclusion

Based on the findings described in the previous chapter, this study arrives at a conclusion that there is any significant relationship between critical thinking ability and writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014. The students with the better critical thinking ability have the better writing ability than the poor ones. The more critical they are, the more creative they develop the writing ideas which lead to their good writing attainment.

B. Implication

Based on the findings of this study, the critical thinking ability has 37.21% contribution towards the writing ability of the sixth semester students of Department of English Education of Syarif Hidayatullah State Islamic University Jakarta academic year 2013/2014. Consequently, the lecturers of Department of English Education are expected to design the writing course that is not only can facilitate students to develop their writing ability but also can explore and develop their critical thinking ability more.

C. Suggestion

This study proposes several suggestions as follows:

1. Beside the language proficiency that must be considered by the sixth semester students of Department of English Education in the English learning process, they also should equip themselves with critical thinking ability for it will not only provide them with the good academic performance (for instance, the writing ability), but it will also make them able to cope with the problems they find in their real life.
2. The raters of students' writing should have the same agreement and understanding about the topics of the test of written English; therefore, any training and discussions should be more provided before the participants' writing responses are rated;
3. The participants' native language can be the preference that is used in critical thinking test in order that there is not any vague result (that is distorted by the participants' knowledge of language) of the critical thinking test conducted by the participants.

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APPENDICES

Appendix 1

Instrument Specification

Variable of the Study	Indicator	Test Number in the instrument	Total of Test Item
Critical Thinking Ability	1. Analyzing inferences.	A1, 2, 3, 4, 5, 6	6
	2. Analyzing assumptions.	A7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17	11
	3. Analyzing deductions.	A18, 19, 20, 21, 22, 23, 24	7
	4. Interpreting information.	A25, 26, 27, 28, 29, 30	6
	5. Analyzing and evaluating arguments.	A31, 32, 33, 34, 35, 36, 37	7
Writing Ability	1. Developing the content of writing well.	B1	1
	2. Organizing the writing ideas well, logically, and cohesively.		
	3. Using the effective and appropriate word choice or vocabulary.		
	4. Using language usage (grammar and sentence structure) well and correctly.		
	5. Using mechanics (spelling, punctuation, and other writing conventions) correctly.		
Total			38

Appendix 2

CRITICAL THINKING TEST[1]

Time: 30 Minutes

Direction:

1. write down clearly on the answer sheet: **your name, student's number (NIM),** and **day/date of the test**;
2. in this part of the test, there are five sections:
   -section 1: Inferences
   -section 2: Assumptions
   -section 3: Deductions
   -section 4: Interpreting Information
   -section 5: Arguments
3. each section has its own instructions that will be explained later;
4. *read the instructions of each section carefully*;
5. cross one of the options that you think is the best answer for each question,
   e.g.:
   for section 1:

   for section 2-5:

6. if you want to correct the answer you have already chosen, just give two horizontal lines on the wrong answer, and then cross another option for the correct one,
   e.g.:
   for section 1:

   for section 2-5:

7. read each question carefully before you answer it;
8. recheck your work before it is submitted.

[1]http://www.assessmentday.co.uk, 2014.

Section 1 (Inferences)

Instructions:

1. an inference is a conclusion drawn from observed or supposed facts. For example, if someone presses a light switch but the light does not turn on, they might infer that the filament has burnt out. However, inferences may or may not be correct; for example in this case, the bulb could be missing, or a fuse could be blown;
2. in this section, the test will begin with a statement of facts that must be regarded as true. After each statement you will be presented with possible inferences which might be drawn from facts in the statement. Analyze each inference separately and decide on its degree of truth;
3. for each inference, you will be provided with 5 possible answers: T**RUE**, **PROBABLY TRUE**, **MORE INFORMATION REQUIRED**, **PROBABLY FALSE**, and **FALSE**;
   - select **TRUE** if you believe the inference is definitely true, i.e. it correctly follows beyond a reasonable doubt;
   - **PROBABLY TRUE** if, based on the facts at hand, you think the inference is PROBABLY TRUE; that it is more likely to be true than false, but not true beyond a reasonable doubt;
   - **MORE INFORMATION REQUIRED**, if you decide that there is no enough data to make a decision based on the provided facts (or lack of facts);
   - **PROBABLY FALSE** if, based on the facts presented, you think the inference is PROBABLY FALSE, i.e. it is more likely to be false than true, but there is not enough evidence to suggest that it is definitely false;
   - **FALSE** if you think the inference is definitely FALSE, i.e. it must be incorrect because it misrepresents the facts provided or contradicts the facts provided in the statement.

Example:

Statement

Some people think that prospective employees should include a photograph with their application form. Such practice traditionally been criticized for allowing more attractive individuals to get ahead in their career over "plain" colleagues. However, one study demonstrates that this is, in fact, untrue. Ruffle, the creator of this study, attributes his findings to the "dumb-blonde hypothesis"—that beautiful women are thought to be unintelligent. Ruffle submits that companies would be better advised adopting the selection model employed by the Belgian public sector, where CVs are anonymous and candidate names, gender, and photographs are not allowed to be included on CVs. Such a model allows the candidate to be selected on factors relevant to the role applied for.

Inference 1: The "dumb-blonde hypothesis" says that more attractive women are incapable of being intelligent.

Correct Answer: True. (The passage states that the "dumb-blonde hypothesis" is that people think beautiful women are thought to be unintelligent; therefore, the answer is "True".)

Inference 2: The model of selecting future employees adopted by the Belgian public sector aims to reduce discrimination based on appearance and gender.

Correct Answer: Probably True (The passage fails to state why the Belgian public sector has chosen to implement this method of selection; however, we can infer, based on the nature of the information in the passage and the topic discussed, that this is a likely reason behind the method chosen. As we cannot be certain of this, the correct answer is "probably true")

Inference 3: The method of selecting future employees adopted by the Belgian public sector has helped to eliminate discrimination in the Belgian public sector.

Correct Answer: More Information Required (The passage fails to provide information on the success rate of this selection method; it simply outlines the method. Therefore, we cannot say whether this model has been successful. For this reason, we require further information before we can make this inference)

Inference 4: The method of selecting future employees adopted by the Belgian public sector has had the effect of increasing discrimination based on appearance within the Belgian public sector.

Correct Answer: Probably False (While the passage fails to provide information on the success rate of this model of employee selection, it states that under this model, future employees cannot provide pictures of themselves with their application. This would suggest that discrimination would be reduced, rather than increased. However, based on the information provided, we cannot say this for certain. For example, increased visual discrimination may in fact take place in the interview.)

Inference 5: The "dumb-blonde hypothesis" says that more attractive women are less capable of being intelligent.

Correct Answer: False (The passage states that the "dumb-blonde hypothesis" is that people think beautiful women are thought to be unintelligent. So based on the passage alone we are told that the theory describes how people perceive beautiful women to be unintelligent, yet does not state that they are actually less intelligent.)

Questions 1-4

Statement one

Although it is agreed that China is rapidly modernizing its army, there is some doubt surrounding the exact amount it is spending. The research institute 'PIPPI', submits that the annual Chinese defense spending has risen from almost $31 billion in 2000 to over $120 billion in 2010. This figure is almost double the official figure published by the Chinese government, who fail to include other areas such as research and development in the official figure each year. In 2010, the United States government spent around $400 billion on military defense. Based on the current level of military growth, statistics suggest that China's defense spending could overtake America's by 2030. In addition to military spending, China's army continues to enjoy the largest number of people within the ranks of its army than any other country.

1. **Inference 1:** The Chinese government published the official figure in terms of their military spending, and this figure is thought to be misleading or in contradiction with the result of research institute 'PIPPI'.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

2. **Inference 2:** The passage notes that the Chinese government fail to include areas such as 'research' and 'development' from their official figure; however, this would also raise some implications that other areas of spending are also absent from the official figure.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

3. **Inference 3:** This is only a clerical error, in case there are any anomalies between the published figure on military spending and the actual figure spent.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

4. **Inference 4:** In 2010, in comparison with the Chinese government, the United States of America had less spending on its military defenses.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

Questions 5-6

Statement two

Turkey is a surprising addition to the list of rapidly developing economies; with a GDP increase of 8.5% in the year 2011 alone. However, such rapid growth leaves worries regarding possible side-effects. For instance, in 2011 Turkey's rate of inflation was well above that of its peers. Secondly, there is increasing concern regarding Turkey's growing dependency on foreign capital. A large portion of the Turkish banking system is part-owned by banks within the Eurozone. As the single currency is uncertain, such dependency raises questions about the stability of Turkish growth.

5. **Inference 1:** Turkish banks are part owned by European banks because this provides greater economic links with Eurozone.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

6. **Inference 2:** There was a stagnant economy in Turkey in 2011.

A. True
B. Probably True
C. More Information Required
D. Probably False
E. False

Section 2 (Assumptions)

Instructions:

1. an assumption is something which is presupposed or taken for granted. When a person says: "I will see you tomorrow", it is taken for granted that they will be around tomorrow, and that they will not have last-minute plans which prevent them from seeing you tomorrow;
2. in this section you will be provided with a number of statements. Each statement will be followed by a series of proposed assumptions;
3. you must decide which assumptions are logically justified based on the evidence in the statement;
4. if you think that the assumption is taken for granted in the statement, and is therefore logically justified, select "**Assumption Made**";
5. if you think that the assumption is not taken for granted in the statement, and is not therefore logically justified, select "**Assumption Not Made**";
6. remember to judge each question individually and base your responses on the statements provided.

Example:

Statement
Monarchic nations, i.e. those with royal families, differ from republican nations in several ways. An example of this difference is that citizens of monarchic nations pay more tax than citizens of republican nations.

Assumption 1: Republican nations do not have a royal family.

Correct Answer: Assumption Made (The statement says that monarchic nations are those with a royal family. The statement is assuming that this is one aspect which differentiates monarchic nations from republican nations. Thus, it can be assumed that Republican nations do not have a royal family.)

Assumption 2: The only types of nation are monarchic and republican.

Correct Answer: Assumption Not Made (The statement is just talking about the differences between two types of nation; it does not imply that these are the only two nor does the statement rely on there being just two types.)

Question 7-8

Statement one

In 2008, the president of the USA promised to prevent the country entering economic depression, but he failed because at the beginning of 2012, over 12 million USA citizens were unemployed.

7. **Assumption 1:** The number of jobless USA citizens should be less than 12 million.

A. Assumption Made

B. Assumption Not Made

8. **Assumption 2:** Presidents should stick to their promises.

A. Assumption Made

B. Assumption Not Made

Questions 9-10

Statement two

Monarchic nations, i.e. those with royal families, differ from republican nations in several ways. An example of this difference is that citizens of monarchic nations pay more tax than citizens of republican nations.

9. **Assumption 1:** The governments of monarchic nations are responsible for setting tax rates on their citizens.

A. Assumption Made

B. Assumption Not Made

10. **Assumption 2:** A monarchic nation cannot be a republican nation.

A. Assumption Made

B. Assumption Not Made

Questions 11-14

Statement three

Chilean students were right in 2012 to stage protest demanding that university education in Chile should be made free.

11. **Assumption 1:** There are some universities outside of Chile which are free.

A. Assumption Made

B. Assumption Not Made

12. **Assumption 2:** Staging protests will influence the costs of Chilean university education.

A. Assumption Made

B. Assumption Not Made

13. **Assumption 3:** Chilean students do not have the funds for the cost of university education.

A. Assumption Made

B. Assumption Not Made

14. **Assumption 4:** Chilean students want to study in university.

A. Assumption Made

B. Assumption Not Made

Questions 15-17

Statement four

Charities don't have to charge VAT (value added-tax) to customers, which mean charity bookshops can change lower prices than those charged by second-hand bookshops which are not registered as a charity.

15. **Assumption 1:** Non-charities pay more tax than charities.

A. Assumption Made

B. Assumption Not Made

16. **Assumption 2:** Customers prefer to pay lower prices.

A. Assumption Made

B. Assumption Not Made

17. **Assumption 3:** VAT increases the price customers pay for things.

A. Assumption Made

B. Assumption Not Made

Section 3 (Deductions)

Instructions:

1. in this section, a statement will be provided followed by a series of suggested conclusions. Here, you must take the statement to be true;
2. after reading each conclusion underneath the statement, you must decide whether you think it follows from the statement provided;
3. if you agree that the conclusion follows the statement, choose **CONCLUSION FOLLOWS**. However, if you do not consider the conclusion to follow, then choose **CONCLUSION DOES NOT FOLLOW**;
4. you must select your answer based only on the information presented; not using general knowledge. Similarly, you are advised not to let your own opinions or prejudices influence your decisions; stick to the statements and base your judgments solely on the facts presented.

Example:

Statement: Sarah owns a new company. New companies are more likely to fail than well established companies. Therefore …

1. **Conclusion one**: Well-established companies are more likely to succeed than new companies.

Correct answer: *Conclusion Follows.*

Explanation: The statement notes that new companies are more likely to fail than well-established companies. ***Well-established companies*** are therefore ***more likely to succeed, by comparison to new companies***.

2. **Conclusion two**: Sarah's company will fail.

Correct answer: *Conclusion Does Not Follow*

Explanation: The statement notes that ***new companies are more likely to fail***. This ***does not mean*** that ***all new companies will fail***.

Questions 18

Statement one

Statistics have shown that companies selling baked goods, such as cakes and pastries, are more likely to be successful if they are advertised as French or Belgian. Therefore:

18. **Conclusion 1:** French and Belgian products are more costly.

A. Conclusion Follows B. Conclusion Does Not Follow

Questions 19-20

Statement two

May 2012 had the highest level of rainfall on record for the preceding fifty years. Therefore:

19. **Conclusion 1:** The rainfall in May 2012 was more than expected.

A. Conclusion Follows B. Conclusion Does Not Follow

20. **Conclusion 2:** The rainfall in May 2012 was greater than in May 2011.

A. Conclusion Follows B. Conclusion Does Not Follow

Questions 21-22

Statement three

Facebook was launched on the American stock market in May 2012. However, statistics suggest that several previously high-performing companies, such as Pandora, Groupon, and LinkedIn fell in value after they were launched on the American stock market. Therefore:

21. **Conclusion 1:** Social networking sites perform badly once they become publicly listed on the stock market.

A. Conclusion Follows B. Conclusion Does Not Follow

22. **Conclusion 2:** All companies decrease in value when first launched on the American stock market.

A. Conclusion Follows B. Conclusion Does Not Follow

Questions 23-24

Statement four

Coley is a company that produces scented candles, using only natural products. Coley is against testing on animals and does not use pesticides in any of its products. Therefore:

23. **Conclusion 1:** The scent from Coley's candles is made from fruits and berries.

A. Conclusion Follows B. Conclusion Does Not Follow

24. **Conclusion 2:** Coley's products are likely to be more costly.

A. Conclusion Follows B. Conclusion Does Not Follow

Section 4 (Interpreting Information)

Instructions:

1. the following questions will consist of a passage of information, followed by a series of conclusions. You are instructed to assume all information in the passage is true. The task is to judge whether or not each of the proposed conclusion logically follows beyond a reasonable doubt from the information given in the paragraph;
2. if you think that a conclusion follows beyond a reasonable doubt (but perhaps not absolutely), select "**CONCLUSION FOLLOWS**";
3. if you think the conclusion does not follow beyond a reasonable doubt based on the facts given, select "**CONCLUSION DOES NOT FOLLOW**";
4. do not use general knowledge when answering, only use the information provided in the passage. Remember to judge each conclusion individually.

Statement
The British National Library has the largest collection of publicly-owned books in the United Kingdom. Therefore:

Conclusion 1: The British National Library is in the United Kingdom.

Correct Answer: *Conclusion Follows* (The statement notes that the British National Library has the largest collection of publicly-owned books ***in the United Kingdom***. For this reason, we can deduce that the British National Library is itself within the United Kingdom. Thus, the correct answer is "Conclusion Follows")

Conclusion 2: There might be a larger collection of publicly-owned books in the United Kingdom.

Correct Answer: *Conclusion Does Not Follow* (The statement notes that the British National Library is ***the largest*** collection of publicly-owned books in the United Kingdom. For this reason, it is not possible for there to be a larger publicly owned collection in the UK. Thus, the correct answer is "Conclusion Does Not Follow")

Question 25-26

Statement one

The Tapoloa Club is a Hawaiian-themed night club in central London. Its most popular drink is the Volcano, which emits sparks and flames. The Tapoloa Club also offers a range of cocktails in perverse containers such as pineapples and coconuts, such as the "Coconut Express" and the "Pineapple Pick-Up" respectively. Therefore:

25. **Conclusion 1:** The "Coconut Express" is the second most popular drink sold by the Tapoloa Club.

A. Conclusion Follows B. Conclusion Does Not Follow

26. **Conclusion 2:** The "Coconut Express" is contained in a pineapple, and the "Pineapple Pick-Up" is contained in a coconut.

A. Conclusion Follows B. Conclusion Does Not Follow

Questions 27-28

Statement two

People with a master's degree in business administration (MBA) earn an income on average 70% higher than people with just an undergraduate degree. MBA students from top business schools earn an income on average 50% higher than the average income of people with MBAs.

27. **Conclusion 1:** A person's income will increase, if he/she gets an MBA.

A. Conclusion Follows B. Conclusion Does Not Follow

28. **Conclusion 2:** The average income of a person obtaining an MBA from a top business school is half higher than that of the average MBA graduate.

A. Conclusion Follows B. Conclusion Does Not Follow

Questions 29-30

Statement three

Hannah has been a solicitor for three years. She works for a law firm in central London and has hopes of being promoted. To be promoted in Hannah's firm, employees must have at least four years' experience practicing as a solicitor. Therefore:

29. **Conclusion 1:** Hannah cannot have a promotion since she lacks enough experience.

A. Conclusion Follows B. Conclusion Does Not Follow

30. **Conclusion 2:** In 3 years' time, assuming that Hannah has not been promoted, she will be over qualified for her current position.

A. Conclusion Follows B. Conclusion Does Not Follow

Section 5 (Analyzing Arguments)

Instructions:

1. in this series of questions, each question is followed by a series of arguments. For this section, you must regard each argument as true, regardless of whether it is weak or strong;
2. if you consider an argument to be strong, select "**Strong Argument**", or if you consider an argument to be weak, select "**Weak Argument**". Judge each question and argument individually. Try not to take into account individual opinion or general knowledge because each argument is considered to be true;
3. **notes:**
   - **a strong argument** is both important and directly related to the question
   - **a weak argument** is not directly related to the question, or is of minor importance. It may also be related to a trivial aspect of the question, or confuses correlation with causation (incorrectly assuming that because two things are related, they cause each other to happen).

Example:

Statement
Should governments be engaging in space exploration research?

1. Argument 1: Yes, the findings of these space exploration research and development programs have been successfully applied to industry, boosting the economies of the host country.

Correct answer: Strong Argument. (The argument directly addresses the initial question, and provides a detailed practical benefit of the initial premise, making this a strong argument).

2. Argument 2: Yes, space exploration has led to numerous discoveries and ushered in the space age.

Correct Answer: Weak Argument (Although the agreement states that discoveries have been made, it does not go into detail about the benefits of those discoveries, and the reference to the space age does not imply a benefit).

Questions 31

Statement one

Should companies downsize their workforces to decrease expenses and maximize profits?

31. **Argument 1:** Yes, companies which have no control over the size of their workforce will be highly vulnerable to economic climates and market changes.

A. Strong Argument

B. Weak Argument

Questions 32-33

Statement two

Should banks and financial institutions be obligated to engage in socially-responsible investing?

32. **Argument 1:** Yes, in comparison to banks which do not engage in socially-responsible investing, the banks engaging in socially responsible investing leads to a happier and more fulfilled workforce.

A. Strong Argument

B. Weak Argument

33. **Argument 2:** No, over-regulation in the financial sector causes reduced opportunities and therefore reduces income and profit.

A. Strong Argument

B. Weak Argument

Questions 34-37

Statement three

Should all members of the European Union join the Eurozone and adopt the euro?

34. **Argument 1:** No, countries may find it difficult to adapt to a new currency.

A. Strong Argument

B. Weak Argument

35. **Argument 2:** Yes, forming a single currency union is the role of the European Union.

A. Strong Argument

B. Weak Argument

36. **Argument 3:** Yes, greater economic unity between countries will lead to some improvement of foreign relations between those member countries, which in turn make each country stronger.

A. Strong Argument

B. Weak Argument

37. **Argument 4:** No, instability of one Eurozone country could bring the whole Eurozone unstable, which make a disruptive influence to the economies of all countries that use the euro.

A. Strong Argument

B. Weak Argument

Appendix 3

TEST OF WRITTEN ENGLISH (INDEPENDENT ESSAY)

Time: 30 Minutes

Direction:

1. read the essay questions/topics*) carefully;
2. there are four topics given, and you are free to choose only **ONE** of them;
3. the essay consists of introduction, body, and conclusion;
4. you have **30 minutes** to plan, write, edit and revise your response;
5. the length of the essay you write should be approximately **300-350 words**;
6. questions/topics:
   a. *It is better for children to grow up in the countryside than in a big city*. Do you agree or disagree? Use specific reasons and details to develop your essay.
   b. *In some countries, teenagers have jobs while they are still students*. Do you think this is a good idea? Support your opinion by using specific reasons and details.
   c. Do you agree or disagree with the following statement? *Watching television is bad for children.* Use specific reasons and details to support your answer.
   d. Do you agree with the following statement? *Face-to-face communication is better than other types of communication, such as letters, email, or telephone calls*. Use specific reasons and details to support your answer.

No.	Scoring Criteria	Description
1.	**Content (30%)**	relevant with the topic chosen.
2.	**Organization (20%)**	ideas are clear, logical, supported, and organized
3.	**Vocabulary (20%)**	use various, effective, and proper words in expressing ideas.
4.	**Usage (25%)**	the grammar used does not obscure the meaning.
5.	**Mechanics (5%)**	good in spelling, paragraphing, capitalization, punctuation, (readable) handwriting, etc.

*) the topics are adopted from http://www.ets.org/

Appendix 4

Writing Assessment Rubric[1]

Participant:		**Topic**: a/b/c/d*)		**Date:**
Aspect	**Score Scale**	**Criteria**		**Score**
Content	30-27	EXCELLENT TO VERY GOOD: knowledgeable • substantive • thorough development of thesis • relevant to assign topic		
	26-22	GOOD TO AVERAGE: some knowledge of subject • adequate range • limited development of thesis • mostly relevant to topic, but lacks detail		
	21-17	FAIR TO POOR: limited knowledge of subject • little substance • inadequate development of topic		
	15-13	VERY POOR: does not show knowledge of subject • non substantive • non pertinent • OR not enough to evaluate		
Organization	20-18	EXCELLENT TO VERY GOOD: fluent expression • ideas clearly stated/supported • succinct • well-organized • logical sequencing • cohesive		
	17-14	GOOD TO AVERAGE: somewhat choppy • loosely organized but main ideas stand out, •limited support • logical but incomplete sequencing		
	13-10	FAIR TO POOR: non-fluent • ideas confused or disconnected • lacks logical sequencing and development		
	9-7	VERY POOR: does not communicate • no organization • OR not enough to evaluate		
Vocabulary	20-18	EXCELLENT TO VERY GOOD: sophisticated range • effective word/idiom choice and usage, word form mastery, appropriate register		
	17-14	GOOD TO AVERAGE: adequate range • occasional errors of word/idiom form, word choice, usage, *but meaning not obscured*		
	13-10	FAIR TO POOR: limited range • frequent errors of word/idiom form, choice, usage •*meaning confused or obscured*		
	9-7	VERY POOR: essentially translation • little knowledge of English vocabulary, idioms, word form • OR not enough to evaluate		
Usage	25-22	EXCELLENT TO VERY GOOD: effective complex construction • few errors of agreement, tense, number, word order/function, articles, pronouns, preposition		
	21-18	GOOD TO AVERAGE: Effective but simple constructions • minor problems in complex construction • several errors of agreement, tense, number, word order/function, articles, pronouns, prepositions *but meaning seldom obscured*		
	17-11	FAIR TO POOR: major problems in simple/complex constructions • frequent errors of negation, agreement, tense, number, word order/function, articles, pronouns, prepositions and/or fragments, run-ons, deletions • *meaning confused or obscured*		
	10-5	VERY POOR: virtually no mastery of sentence construction rules • dominated by errors • does not communicate • OR not enough to evaluate		
Mechanics	5	EXCELLENT TO VERY GOOD: demonstrates mastery of conventions • few errors of spelling, punctuation, capitalization, paragraphing		
	4	GOOD TO AVERAGE: occasional errors of spelling, punctuation, capitalization, paragraphing, *but meaning not obscured*		
	3	FAIR TO POOR: frequent errors of spelling, punctuation, capitalization, paragraphing • poor handwriting • *meaning confused or obscured*		
	2	VERY POOR: no mastery of conventions • dominated by errors of spelling, punctuation, capitalization, paragraphing • handwriting illegible • OR not enough to evaluate		
Total Score				
Comment:				**Rater,** .....

*) Circle one of the letters in accordance with the topic chosen by the participant.

[1]This is an analytic scoring developed by Jacob et. al, quoted in Sara Cushing Weigle, *Assessing Writing*, (New York: Cambridge University Press, 2002), p. 116.

Appendix 6

Instrument Reliability of Critical Thinking Test (Using KR-20 Equation)*

No.	Participants	Item no.																																									Total	Dev	Dev^2
		1	2	4	5	9	10	12	13	14	15	16	17	18	19	20	21	22	23	26	27	28	29	30	32	33	35	36	37	39	41	45	46	49	50	51	52	53			
1	S106	0	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	25	7.485	56.02
2	S102	1	0	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	1	28	10.48	109.9
3	S114	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	0	1	1	0	0	1	0	1	0	1	23	5.485	30.08
4	S124	0	0	0	1	0	0	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0	24	6.485	42.05
5	S113	0	0	0	1	0	0	1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	6.485	42.05
6	S112	0	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	1	0	0	1	1	0	0	0	23	5.485	30.08
7	S111	0	0	0	1	0	0	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	0	0	0	1	1	0	1	1	0	1	22	4.485	20.11
8	S103	0	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	1	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	0	0	1	1	1	21	3.485	12.14
9	S097	1	1	1	0	0	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	1	0	1	1	19	1.485	2.205
10	S121	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	18	0.485	0.235
11	S089	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	1	18	0.485	0.235
12	S122	0	1	0	1	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	1	1	0	0	0	1	1	1	0	1	0	0	0	0	1	1	1	1	17	-0.515	0.265
13	S101	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	1	1	1	1	0	1	0	1	0	1	0	0	0	1	1	0	1	1	1	1	1	1	18	0.485	0.235
14	S023	0	1	0	0	1	0	1	1	1	0	0	0	1	1	0	0	0	1	0	0	0	1	1	1	0	1	1	0	0	0	1	1	1	0	1	1	1	19	1.485	2.205
15	S108	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	1	0	0	1	1	1	0	1	1	0	0	1	0	1	1	1	1	17	-0.515	0.265
16	S104	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	1	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	1	1	0	18	0.485	0.235
17	S110	1	0	1	1	1	0	0	1	0	0	1	0	1	0	0	1	1	1	0	1	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	17	-0.515	0.265
18	S116	0	0	0	1	0	1	0	0	1	1	0	1	0	0	1	0	0	0	0	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	0	19	1.485	2.205
19	S105	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	1	1	14	-3.515	12.36
20	S093	1	1	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	1	1	0	1	0	1	0	1	0	0	0	1	1	1	0	1	0	18	0.485	0.235
21	S119	0	0	0	1	1	0	0	0	1	1	0	0	1	0	1	1	0	1	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	0	1	0	1	17	-0.515	0.265
22	S109	0	0	0	1	1	0	0	0	1	1	0	0	1	1	1	0	1	1	0	1	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	1	0	16	-1.515	2.296
23	S120	0	0	0	1	0	1	1	1	1	0	0	0	0	0	1	0	1	1	1	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	1	1	1	16	-1.515	2.296
24	S128	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	1	15	-2.515	6.326
25	S094	0	0	0	1	0	0	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	1	1	0	1	1	0	1	0	0	0	1	0	0	0	1	16	-1.515	2.296
26	S079	0	0	0	1	0	1	0	1	0	0	0	0	1	1	1	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	1	0	1	1	1	1	16	-1.515	2.296
27	S115	1	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	1	0	1	1	1	0	1	0	14	-3.515	12.36
28	S096	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	13	-4.515	20.39
29	S092	0	0	0	0	1	0	1	0	1	1	0	0	0	1	0	1	0	1	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	1	14	-3.515	12.36
30	S091	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	12	-5.515	30.42
31	S129	0	1	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	9	-8.515	72.51
32	S095	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	0	0	0	0	0	9	-8.515	72.51
33	S107	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	9	-8.515	72.51
Total		8	10	4	24	7	16	12	13	15	15	15	8	22	16	13	17	18	24	12	19	19	15	16	26	17	14	11	10	19	17	11	17	15	18	20	21	24	578	-1E-14	672.2
p		0.242	0.303	0.121	0.727	0.212	0.485	0.364	0.394	0.455	0.455	0.455	0.242	0.667	0.485	0.394	0.515	0.545	0.727	0.364	0.576	0.576	0.45	0.485	0.788	0.515	0.424	0.333	0.303	0.576	0.515	0.333	0.515	0.455	0.545	0.606	0.636	0.727			
q		0.758	0.697	0.879	0.273	0.788	0.515	0.636	0.606	0.545	0.545	0.545	0.758	0.333	0.515	0.606	0.485	0.455	0.273	0.636	0.424	0.424	0.55	0.515	0.212	0.485	0.576	0.667	0.697	0.424	0.485	0.667	0.485	0.545	0.455	0.394	0.364	0.273			
pq		0.184	0.211	0.107	0.198	0.167	0.25	0.231	0.239	0.248	0.248	0.248	0.184	0.222	0.25	0.239	0.25	0.248	0.198	0.231	0.244	0.244	0.25	0.25	0.167	0.25	0.244	0.222	0.211	0.244	0.25	0.222	0.25	0.248	0.248	0.239	0.231	0.198			

Σpq	8.364
M	17.52
k	53
S^2	20.37
r_{11}	0.601

Notes:

p: the proportion of participants who choose the right answer

q: the proportion of participants who choose the wrong answer (q=1-p)

Σpq: the total of multiplication between p and q

k: the total of items

M: the mean score of the right answer

S^2: variance score

Dev: deviation score from mean score

Dev^2: deviation score from square mean score

r11: the instrument realibility using KR-20 (r11=(k/k-1)(S^2-Σpq/S^2))

*only the items which were accepted or not deleted after instrument try out/item analysis (see also Appendix: item analysis and instrument validity)

Appendix 7

Raw Data of Critical Thinking Ability

No.	Participant	Score
1	1	64.865
2	2	54.054
3	3	54.054
4	4	56.757
5	5	51.351
6	6	43.243
7	7	43.243
8	8	43.243
9	9	45.946
10	10	51.351
11	11	56.757
12	12	48.649
13	13	40.541
14	14	59.459
15	15	62.162
16	16	51.351
17	17	51.351
18	18	40.541
19	19	37.838
20	20	59.459
21	21	48.649
22	22	48.649
23	23	40.541
24	24	51.351
25	25	67.568
26	26	64.865
27	27	51.351
28	28	40.541
29	29	56.757
30	30	51.351
31	31	45.946
32	32	54.054
33	33	56.757
34	34	48.649
35	35	37.838
36	36	70.27
37	37	45.946
38	38	48.649
39	39	35.135
40	40	40.541
41	41	43.243
42	42	54.054
43	43	59.459
44	44	54.054
45	45	48.649
46	46	27.027
47	47	62.162
48	48	45.946
49	49	43.243
50	50	56.757
51	51	54.054
52	52	51.351
53	53	35.135
54	54	56.757
55	55	32.432
56	56	64.865
57	57	51.351
58	58	54.054
59	59	51.351
60	60	40.541
Total		3008.11
Maximum		70.27
Minimum		27.027
Range		43.243

Appendix 8

Raw Data of Writing Ability

No.	Participant	Rater 1					Total	Rater 2					Total	Final Score*
		C	O	V	U	M		C	O	V	U	M		
1	1	21	13	14	18	4	70	17	13	13	13	3	59	64.5
2	2	23	14	14	18	4	73	21	14	15	17	4	71	72
3	3	23	16	14	18	4	75	24	17	17	15	4	77	76
4	4	22	15	15	19	4	75	22	15	16	17	4	74	74.5
5	5	22	17	13	18	4	74	19	17	13	13	3	65	69.5
6	6	23	14	13	18	4	72	18	13	10	10	2	53	62.5
7	7	21	13	13	17	4	68	15	10	10	14	3	52	60
8	8	27	20	17	21	4	89	23	18	14	15	4	74	81.5
9	9	22	15	15	18	4	74	21	13	13	11	3	61	67.5
10	10	24	15	16	18	4	77	23	15	14	18	4	74	75.5
11	11	23	14	15	18	4	74	22	14	14	17	4	71	72.5
12	12	22	14	14	17	4	71	22	13	13	15	3	66	68.5
13	13	22	14	14	17	4	71	14	11	12	11	3	51	61
14	14	23	15	15	11	4	68	24	15	14	15	4	72	70
15	15	21	13	13	18	4	69	21	14	14	18	4	71	70
16	16	20	13	13	21	4	71	19	13	13	19	3	67	69
17	17	24	15	17	23	4	83	23	12	14	18	4	71	77
18	18	27	18	18	19	5	87	21	16	13	13	3	66	76.5
19	19	22	16	16	17	4	75	20	13	12	12	3	60	67.5
20	20	22	15	17	20	4	78	24	17	19	18	4	82	80
21	21	27	15	18	18	4	82	22	14	14	18	3	71	76.5
22	22	22	16	14	21	4	77	19	13	14	15	3	64	70.5
23	23	22	14	15	18	4	73	16	13	13	12	3	57	65
24	24	26	17	18	22	5	88	22	14	18	17	3	74	81
25	25	27	17	18	21	5	88	24	14	13	19	4	74	81
26	26	22	14	14	18	4	72	24	19	17	18	4	82	77
27	27	20	16	15	20	3	74	19	13	16	16	3	67	70.5
28	28	22	14	14	16	4	70	21	12	10	14	3	60	65
29	29	22	15	14	18	4	73	23	17	16	18	4	78	75.5
30	30	22	14	13	11	4	64	22	13	14	14	3	66	65
31	31	26	16	18	21	4	85	23	14	16	17	4	74	79.5
32	32	22	14	13	18	4	71	23	17	17	13	4	74	72.5
33	33	25	17	15	18	4	79	23	19	15	17	4	78	78.5
34	34	21	13	14	16	3	67	22	14	9	13	3	61	64
35	35	25	16	13	18	4	76	23	14	13	11	3	64	70
36	36	22	14	15	18	4	73	22	17	15	21	4	79	76
37	37	22	13	16	18	4	73	20	12	14	16	4	66	69.5
38	38	22	16	14	18	4	74	22	17	11	11	3	64	69
39	39	21	14	15	18	4	72	17	14	11	12	3	57	64.5
40	40	21	13	15	18	4	71	20	10	11	11	3	55	63
41	41	23	15	14	18	4	74	21	13	10	12	3	59	66.5
42	42	21	14	14	17	4	70	21	14	13	16	3	67	68.5
43	43	23	15	15	18	4	75	22	18	17	19	3	79	77
44	44	26	16	16	19	4	81	22	17	12	12	3	66	73.5
45	45	28	17	19	21	5	90	23	14	16	18	3	74	82
46	46	21	13	10	18	4	66	14	8	10	10	3	45	55.5
47	47	22	14	17	18	4	75	20	13	14	17	4	68	71.5
48	48	22	16	17	14	4	73	19	13	14	13	3	62	67.5
49	49	17	13	17	18	4	69	17	11	14	18	4	64	66.5
50	50	23	15	15	18	4	75	19	14	15	15	4	67	71
51	51	25	18	16	18	4	81	25	17	17	16	4	79	80
52	52	22	14	15	18	4	73	21	10	9	17	3	60	66.5
53	53	17	10	13	15	3	58	15	9	8	8	2	42	50
54	54	24	18	18	21	5	86	27	18	17	21	4	87	86.5
55	55	17	12	16	20	4	69	14	10	13	13	3	53	61
56	56	26	17	17	20	4	84	23	17	17	21	4	82	83
57	57	22	16	17	19	4	78	20	14	14	15	4	67	72.5
58	58	22	14	15	18	4	73	23	15	16	18	4	76	74.5
59	59	21	14	14	17	4	70	17	13	14	15	3	62	66
60	60	21	13	14	18	4	70	20	13	12	12	3	60	65
∑							4416	∑					4021	4253.5

*final score= average score of rater 1 and rater 2

	Final Score	Rater 1	Rater 2
Maximum	86.5	90	87
Minimum	50	58	42
Range	36.5	32	45

Note:
C: Content
O: Organization
V: Vocabulary
U: Usage
M: Mechanics

Appendix 9

Descriptive Statistics of Critical Thinking Ability Data

Descriptive Statistics			Statistic	Std. Error
CT	Mean		50.1351	1.16065
	95% Confidence Interval for Mean	Lower Bound	47.8127	
		Upper Bound	52.4576	
	5% Trimmed Mean		50.2002	
	Median		51.3510	
	Variance		80.827	
	Std. Deviation		8.99036	
	Minimum		27.03	
	Maximum		70.27	
	Range		43.24	
	Interquartile Range		13.51	
	Skewness		-.108	.309
	Kurtosis		-.087	.608

Appendix 10

Descriptive Statistics of Writing Ability Data (Rater 1)

Descriptive Statistics			Statistic	Std. Error
Rater_1	Mean		74.7667	.83374
	95% Confidence Interval for Mean	Lower Bound	73.0984	
		Upper Bound	76.4350	
	5% Trimmed Mean		74.6481	
	Median		73.5000	
	Variance		41.707	
	Std. Deviation		6.45812	
	Minimum		58.00	
	Maximum		90.00	
	Range		32.00	
	Interquartile Range		6.75	
	Skewness		.555	.309
	Kurtosis		.477	.608

Appendix 11

Descriptive Statistics of Writing Ability Data (Rater 2)

Descriptive Statistics			Statistic	Std. Error
Rater_2	Mean		67.0167	1.21722
	95% Confidence Interval for Mean	Lower Bound	64.5810	
		Upper Bound	69.4523	
	5% Trimmed Mean		67.2593	
	Median		67.0000	
	Variance		88.898	
	Std. Deviation		9.42857	
	Minimum		42.00	
	Maximum		87.00	
	Range		45.00	
	Interquartile Range		13.75	
	Skewness		-.325	.309
	Kurtosis		-.018	.608

Appendix 12

Descriptive Statistics of Writing Ability Data (Final Score)

Descriptive Statistics			Statistic	Std. Error
FWA	Mean		70.8917	.91597
	95% Confidence Interval for Mean	Lower Bound	69.0588	
		Upper Bound	72.7245	
	5% Trimmed Mean		71.0463	
	Median		70.2500	
	Variance		50.340	
	Std. Deviation		7.09505	
	Minimum		50.00	
	Maximum		86.50	
	Range		36.50	
	Interquartile Range		10.25	
	Skewness		-.238	.309
	Kurtosis		.265	.608

Appendix 13

Summary of Normality Test with Shaphiro-Wilks W Test

	Shapiro-Wilk W		
	Statistic	df	Sig.
CT	.988	60	.807
Rater_1	.938	60	.004
Rater_2	.984	60	.622
FWA	.986	60	.743

Inter-Rater Reliability of Writing Ability

No.	Participant	Rater 1					Total (y1)	Rater 2					Total (y2)	r*
		C	O	V	U	M		C	O	V	U	M		
1	1	21	13	14	18	4	70	17	13	13	13	3	59	0.580987
2	2	23	14	14	18	4	73	21	14	15	17	4	71	
3	3	23	16	14	18	4	75	24	17	17	15	4	77	
4	4	22	15	15	19	4	75	22	15	16	17	4	74	
5	5	22	17	13	18	4	74	19	17	13	13	3	65	
6	6	23	14	13	18	4	72	18	13	10	10	2	53	
7	7	21	13	13	17	4	68	15	10	10	14	3	52	
8	8	27	20	17	21	4	89	23	18	14	15	4	74	
9	9	22	15	15	18	4	74	21	13	13	11	3	61	
10	10	24	15	16	18	4	77	23	15	14	18	4	74	
11	11	23	14	15	18	4	74	22	14	14	17	4	71	
12	12	22	14	14	17	4	71	22	13	13	15	3	66	
13	13	22	14	14	17	4	71	14	11	12	11	3	51	
14	14	23	15	15	11	4	68	24	15	14	15	4	72	
15	15	21	13	13	18	4	69	21	14	14	18	4	71	
16	16	20	13	13	21	4	71	19	13	13	19	3	67	
17	17	24	15	17	23	4	83	23	12	14	18	4	71	
18	18	27	18	18	19	5	87	21	16	13	13	3	66	
19	19	22	16	16	17	4	75	20	13	12	12	3	60	
20	20	22	15	17	20	4	78	24	17	19	18	4	82	
21	21	27	15	18	18	4	82	22	14	14	18	3	71	
22	22	22	16	14	21	4	77	19	13	14	15	3	64	
23	23	22	14	15	18	4	73	16	13	13	12	3	57	
24	24	26	17	18	22	5	88	22	14	18	17	3	74	
25	25	27	17	18	21	5	88	24	14	13	19	4	74	
26	26	22	14	14	18	4	72	24	19	17	18	4	82	
27	27	20	16	15	20	3	74	19	13	16	16	3	67	
28	28	22	14	14	16	4	70	21	12	10	14	3	60	
29	29	22	15	14	18	4	73	23	17	16	18	4	78	
30	30	22	14	13	11	4	64	22	13	14	14	3	66	
31	31	26	16	18	21	4	85	23	14	16	17	4	74	
32	32	22	14	13	18	4	71	23	17	17	13	4	74	
33	33	25	17	15	18	4	79	23	19	15	17	4	78	
34	34	21	13	14	16	3	67	22	14	9	13	3	61	
35	35	25	16	13	18	4	76	23	14	13	11	3	64	
36	36	22	14	15	18	4	73	22	17	15	21	4	79	
37	37	22	13	16	18	4	73	20	12	14	16	4	66	
38	38	22	16	14	18	4	74	22	17	11	11	3	64	
39	39	21	14	15	18	4	72	17	14	11	12	3	57	
40	40	21	13	15	18	4	71	20	10	11	11	3	55	
41	41	23	15	14	18	4	74	21	13	10	12	3	59	
42	42	21	14	14	17	4	70	21	14	13	16	3	67	
43	43	23	15	15	18	4	75	22	18	17	19	3	79	
44	44	26	16	16	19	4	81	22	17	12	12	3	66	
45	45	28	17	19	21	5	90	23	14	16	18	3	74	
46	46	21	13	10	18	4	66	14	8	10	10	3	45	
47	47	22	14	17	18	4	75	20	13	14	17	4	68	
48	48	22	16	17	14	4	73	19	13	14	13	3	62	
49	49	17	13	17	18	4	69	17	11	14	18	4	64	
50	50	23	15	15	18	4	75	19	14	15	15	4	67	
51	51	25	18	16	18	4	81	25	17	17	16	4	79	
52	52	22	14	15	18	4	73	21	10	9	17	3	60	
53	53	17	10	13	15	3	58	15	9	8	8	2	42	
54	54	24	18	18	21	5	86	27	18	17	21	4	87	
55	55	17	12	16	20	4	69	14	10	13	13	3	53	
56	56	26	17	17	20	4	84	23	17	17	21	4	82	
57	57	22	16	17	19	4	78	20	14	14	15	4	67	
58	58	22	14	15	18	4	73	23	15	16	18	4	76	
59	59	21	14	14	17	4	70	17	13	14	15	3	62	
60	60	21	13	14	18	4	70	20	13	12	12	3	60	
∑							**4416**	∑					**4021**	

*in this case, the score r (inter-rater reliability) is calculated by using Excel Program (r=Pearson(y1 data set, y2 data set)

Appendix 15

Critical Thinking Ability and Writing Ability

No.	Participant	X	Y	XY	X^2	Y^2
1	1	64.865	64.5	4183.7925	4207.4682	4160.25
2	2	54.054	72	3891.888	2921.8349	5184
3	3	54.054	76	4108.104	2921.8349	5776
4	4	56.757	74.5	4228.3965	3221.357	5550.25
5	5	51.351	69.5	3568.8945	2636.9252	4830.25
6	6	43.243	62.5	2702.6875	1869.957	3906.25
7	7	43.243	60	2594.58	1869.957	3600
8	8	43.243	81.5	3524.3045	1869.957	6642.25
9	9	45.946	67.5	3101.355	2111.0349	4556.25
10	10	51.351	75.5	3877.0005	2636.9252	5700.25
11	11	56.757	72.5	4114.8825	3221.357	5256.25
12	12	48.649	68.5	3332.4565	2366.7252	4692.25
13	13	40.541	61	2473.001	1643.5727	3721
14	14	59.459	70	4162.13	3535.3727	4900
15	15	62.162	70	4351.34	3864.1142	4900
16	16	51.351	69	3543.219	2636.9252	4761
17	17	51.351	77	3954.027	2636.9252	5929
18	18	40.541	76.5	3101.3865	1643.5727	5852.25
19	19	37.838	67.5	2554.065	1431.7142	4556.25
20	20	59.459	80	4756.72	3535.3727	6400
21	21	48.649	76.5	3721.6485	2366.7252	5852.25
22	22	48.649	70.5	3429.7545	2366.7252	4970.25
23	23	40.541	65	2635.165	1643.5727	4225
24	24	51.351	81	4159.431	2636.9252	6561
25	25	67.568	81	5473.008	4565.4346	6561
26	26	64.865	77	4994.605	4207.4682	5929
27	27	51.351	70.5	3620.2455	2636.9252	4970.25
28	28	40.541	65	2635.165	1643.5727	4225
29	29	56.757	75.5	4285.1535	3221.357	5700.25
30	30	51.351	65	3337.815	2636.9252	4225
31	31	45.946	79.5	3652.707	2111.0349	6320.25
32	32	54.054	72.5	3918.915	2921.8349	5256.25
33	33	56.757	78.5	4455.4245	3221.357	6162.25
34	34	48.649	64	3113.536	2366.7252	4096
35	35	37.838	70	2648.66	1431.7142	4900
36	36	70.27	76	5340.52	4937.8729	5776
37	37	45.946	69.5	3193.247	2111.0349	4830.25
38	38	48.649	69	3356.781	2366.7252	4761
39	39	35.135	64.5	2266.2075	1234.4682	4160.25
40	40	40.541	63	2554.083	1643.5727	3969
41	41	43.243	66.5	2875.6595	1869.957	4422.25
42	42	54.054	68.5	3702.699	2921.8349	4692.25
43	43	59.459	77	4578.343	3535.3727	5929
44	44	54.054	73.5	3972.969	2921.8349	5402.25
45	45	48.649	82	3989.218	2366.7252	6724
46	46	27.027	55.5	1499.9985	730.45873	3080.25
47	47	62.162	71.5	4444.583	3864.1142	5112.25
48	48	45.946	67.5	3101.355	2111.0349	4556.25
49	49	43.243	66.5	2875.6595	1869.957	4422.25
50	50	56.757	71	4029.747	3221.357	5041
51	51	54.054	80	4324.32	2921.8349	6400
52	52	51.351	66.5	3414.8415	2636.9252	4422.25
53	53	35.135	50	1756.75	1234.4682	2500
54	54	56.757	86.5	4909.4805	3221.357	7482.25
55	55	32.432	61	1978.352	1051.8346	3721
56	56	64.865	83	5383.795	4207.4682	6889
57	57	51.351	72.5	3722.9475	2636.9252	5256.25
58	58	54.054	74.5	4027.023	2921.8349	5550.25
59	59	51.351	66	3389.166	2636.9252	4356
60	60	40.541	65	2635.165	1643.5727	4225
Total		**3008.108**	**4253.5**	**215528.37**	**155580.67**	**304507.75**

Notes:
X: Students' Critical Thinking Ability
Y: Students' Writing Ability

	X	Y
Minimum	27.027	50
Maximum	70.27	86.5

Appendix 16

Critical Values of Pearson Product Moment Correlation Coefficient*)[1]

df	Non Directional (Two-Tail) Test	
	α=5%	α= 1%
20	0.4227	0.5368
25	0.3809	0.4869
30	0.3494	0.4487
35	0.3246	0.4182
40	0.3044	0.3932
45	0.2875	0.3721
50	0.2732	0.3541
60	0.2500	0.3248
70	0.2319	0.3017
80	0.2172	0.2830
90	0.2050	0.2673
100	0.1946	0.2540

*) due to the needs or importance of this study, only some certain values of Pearson Product Moment Correlation Coefficient (*r*) are presented here (i.e. *r* with df=20 up to df=100and at α=5% and α=1%).

[1]Lyle F. Bachman, *Statistical Analyses for Language Assessment*, (Cambridge: Cambridge University Press, 2005), p. 342

Appendix 17

Critical Values of *t)[2]**

df	Two-Tail Test	
	α=5%	**α=1%**
21	2.080	2.831
22	2.074	2.819
23	2.069	2.807
24	2.064	2.797
25	2.060	2.787
26	2.056	2.779
27	2.052	2.771
28	2.048	2.763
29	2.045	2.756
30	2.042	2.750
40	2.021	2.704
60	2.000	2.660
120	1.980	2.617
∞	1.960	2.576

*) due to the needs or importance of this study, only some certain values of *t* are presented here (i.e. *t* with df=20 up to df= ∞ and at α=5% and α=1%).

[2]*Ibid*., p. 336.

Appendix 18

Preliminary Study: Writing Ability of the Sixth Semester Students of Department of English Education

No.	Score		Frequency	Percentage (%)	Total	Category	Average
	In number	In letter					
1.	50	D	2	4.5	11.3%	Poor	67.15
2.	57	D	1	2.3			
3.	58	D	2	4.5			
4.	60	C	6	13.6	34.1%	Fair	
5.	65	C	5	11.4			
6.	68	C	4	9.1			
7.	70	B	9	20.5	43.1%	Average to Good	
8.	72	B	2	4.5			
9.	75	B	6	13.6			
10.	78	B	2	4.5			
11.	80	A	5	11.4	11.4%	Good	

(Source: Documentation of Department of English Education 2013/2014, Mid Semester Test of 44 students)