

**THE RELATIONSHIP BETWEEN
INTELLIGENCE, CRITICAL THINKING SKILLS IN READING AND
EFL PROFICIENCY
AMONG EFL LEARNERS**

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ABSTRACT

Regarding the Indonesian government need to increase English as a Foreign Language (EFL) proficiency scores, the present study is intended to find the relationship between intelligence (IQ), critical thinking skills (CTS) and EFL proficiency among pre-advanced EFL learners in Indonesia. Thirty five respondents having EFL proficiency scores of at least 500 are taken as the samples of the study. All of the respondents are further being given a test on intelligence and critical thinking skills in reading respectively. The scores of EFL proficiency are taken from the English students records in the even semester of 2011/2012. All of the three results of scores are analyzed using multiple regression analysis. On the basis of this analysis, the research questions are: how IQ is related to CTS in reading, and how IQ and CTS in reading contribute to EFL proficiency. The first result shows that there is no significant relationship between IQ and CTS in reading. The pedagogical implication is that in order to be able to read EFL reading, EFL learners do not need specific level of IQ. The second result indicates that there is no significant relationship between IQ scores and EFL proficiency scores, but there is a significant relationship between the scores of CTS in reading and EFL proficiency. The pedagogical implication is that the scores of CTS in reading are not influenced by the level of IQ and thus CTS in reading can be taught in the classroom to increase EFL proficiency.

INTRODUCTION

English as a Foreign Language (EFL) proficiency is one of the communicative competences in English teaching that should be attained in higher education curriculum in Indonesia. This communicative competence comprises both linguistic and performance competences that has become the agenda of national curriculum in higher education (*Peraturan Presiden RI No.8 tentang KKNi, 2012*). Those competences have been inclusively integrated in designing the curriculum in higher education in the recent years. However, some studies have indicated that most of EFL learners still have unsatisfactory result in English as Foreign Language (EFL) proficiency (Lie, 2007). The low scores of EFL reading and English

communication is possibly the causes of the unsatisfactory scores on EFL proficiency. This finding is indicated as many studies to increase EFL reading competences (Sulistyo & Suharmanto, 2007; Lie, 2007, Iftanti, 2012). As the studies touch the external factors such as the unsatisfactory results of EFL proficiency, there are still few discussing the role of internal factors like intelligence and critical thinking skills in the development of EFL proficiency.

The relationship among intelligence, critical thinking skills in reading and EFL reading proficiency is tied by cognitive competences. Each contains both verbal and non-verbal reasoning as the primary components. The term verbal and non verbal reasoning in IQ (Sternberg, 2009) appears similar to the term analysis and assessment in CTS in reading (Paul, 2006), and it is equal to the term literal and evaluative competence in EFL reading proficiency based on Barrett's taxonomy of reading comprehension (Clymer, 1968).

Intelligence is a concept that can be viewed as tying together all of the cognitive psychology. Intelligent Quotient, further called IQ is defined as capacity to learn from experience, using metacognitive processes to enhance learning and the ability to adapt to the surrounding environment. For adult learners, it consists of six verbal competence or verbal scales and five performance competence or performance scales. The six verbal scales involve comprehension including linguistic competence and verbal reasoning; vocabulary, ability to develop new vocabularies; information, consisting schemata for general knowledge; similarities, ability to develop implied meaning; arithmetic, ability to count; and digit span that can stimulate attention and concentration. Performance scales includes five non verbal competence namely objects assembly that stimulates ability to make performance reasoning; block design, that is coordinating visual and motor; picture completion, to encourage intense observation; picture arrangement that sharpen analysis and logical thinking and digit symbol that advance motor skills (Sternberg, 2009).

There are various kinds of intelligence such as Intelligence Quotient (IQ), Emotional Quotient (EQ) and social intelligence, and each of which could be assessed. The way to assess intelligence is by conducting intelligence test or Intelligence Quotient (IQ) test. This type of test could be conducted to assess a person of a given life span.

Life-span development is a development of life from conception to the entire life. Santrock (2002) divides stages in life-span development into eight stages from the prenatal stage to the late adulthood. Firstly, the prenatal stage starts from conception to birth. Secondly, the infancy begins from birth at full term to about 18 months. Thirdly, the early childhood is from about 18 months to about 6 years. Next, the late childhood is about 6 years to about 13 years. After that, adolescence is from about 13 years to about 20 years. Early adulthood starts from about 20 years to about 30 years. Then, middle adulthood begins about 30 years to about 65 years. Finally, late adulthood is from about 65 years and older. The cognitive development of each period is varied. What has been the focus of this study is investigating the cognitive competences of early adulthood that is at the higher education between the ages of 20 to 30 years old and identifying their cognitive competences including intelligence, critical thinking skills and EFL reading proficiency. This becomes important to investigate due to the need of increasing EFL proficiency for Indonesian students (Suparmi 1991).

Other than life-span development, Clymer (1968) emphasizes on cognitive development which is divided into four stages namely sensorimotor stage (0-2), preoperational (2-7), concrete operations (7-11) and formal operations (11-up) (Sternberg, 2009). Firstly, in sensorimotor stage, a child begins life with small number of sensorimotor sequence, for example developing object permanence and the beginning of symbolic thought. Secondly, in preoperational stage, a child begins to develop egocentrism and improved ability to use symbolic thought. Thirdly, in the concrete operation stage a child can reason with

respect to concrete and physical objects. Finally, in formal operation stage, a child could develop capacity for abstract reasoning and hypothetical thinking. This stage is the early beginning of critical thinking.

In addition to Clymer (1968), Perry (1970) continued the development of cognitive skills for early adulthood. It is commonly called post-formal thought. Post formal thought is ability to develop rigid reasoning to more flexible one. These two elements are the key elements of post-formal thought which is a mature thinking based on logic, subjective and intuitive experience. This way of thinking helps a person to solve ambiguity, to clear skepticism, to reduce inconsistency, to lessen contradiction, to tolerate imperfection and finally to accept compromise.

The cognitive developments in post formal thought are divided into four stages namely shifting gears, multiple causality, pragmatism and awareness of paradox. The first stage namely shifting gear is two ways of thinking between abstract and practice. In this stage, a thinker should be able to internalize what is abstract and how to apply it in practical situation. The second stage, multiple causality or the multiple solutions, is an ability to be aware of the reality that a problem has more than one cause, and automatically it has more than one solution. A higher education student should be aware of this phenomenon and regard it critically. The third stage, pragmatism, is an ability to choose the best solution from the many possibilities and recognize the chosen criteria. This stage challenges the higher education students to think critically to find the best decision. The last one is awareness of paradox. That is being aware of the fact that each solution carries its potential conflict. These four cognitive developments in higher education are the ones that occur in early adulthood, thus, people at these ages should be aware of these cognitive skills and use them appropriately.

The most common instrument to measure adult intelligence is Wechsler Adult Intelligence Scale (WAIS), which consists of crystallized and fluid intelligence (Sternberg, 2009). The former is the ability to use skills, knowledge and experience. It relies on accessing information from long-term memory. In WAIS, this crystallized intelligence can be measured in the verbal scales. Different from crystallized, fluid intelligence is the capacity to think logically and solve problems in novel situation. It is the ability to analyze and identify problems using logic (inductive and deductive reasoning). WAIS measures fluid intelligence on the performance scales. The overall scores in WAIS consists of combination of the two scales (Cherry, 2013)

The role of IQ in EFL proficiency scores can be traced through the verbal intelligence such as the skill of comprehending a message, understanding vocabularies, citing information and finding similarities. Such a comprehending and understanding belong to the cognitive domain of Bloom taxonomy (Huitt, 2004).

In addition to intelligence, critical thinking skills, further called CTS, is another skill that is required to survive in this globalization era. The tight and worldwide competition in this era requires people to have CTS to innovate ideas in technology, to increase educational quality and to produce outstanding human resources (Kameo, 2007). CTS in this study are defined as the ability to analyze and assess source of information to challenge the authority to identify the weakness of the argument using certain standards or criteria. The given standards and criteria are taken from Paul (2006) who elaborates CT into eight elements of reasoning and nine intellectual standards. These eight elements of reasoning are establishing purpose, raising questions, looking for information, making inferences, constructing concepts, making assumptions, drawing implications and establishing point of view, and nine intellectual standards. These eight elements actively help establishing reasoning skills to achieve particular intellectual standards. These standards are the nine intellectual standards

considered as standards of judging something intellectually which consist of ability to identify clarity, accuracy, precision, relevance, depth, breadth, logic, significance and fairness. These nine standards can be used as a measurement to see how critical someone in thinking is. Since the eight elements and the nine standards of CT by Paul (2006) has been proved to be successful in measuring the CT of the students in different levels of competence (Stonewater J.K.& Wolcott, S.K. 2005, Crook, 2006; Scanlan, 2006; Niewoehner & Steidle, 2008).

Although CTS are important to conduct in the teaching and learning process, there are some constraints that hamper their implementation in the classroom; one of them is the cultural constraint. The CT-based learning, as mentioned above, is not yet cultivated well in EFL teaching and learning in Indonesia due to the cultural constraints. Kameo (2007) reported that no matter how good CT sounds in theory, it cannot be automatically transplanted into a culture which holds different values. There are two dimensions of culture in her point of view namely power distance and individualism. The former deals with the authority given by teachers to the students, and the latter related to the individualism. She emphasized that Indonesian students tend to respect their teachers too highly such as accepting answers of a question without questioning and waiting for top-down instruction without initiating. These two factors might be the indicators of valuing submissiveness that do not encourage the development of CTS (Kameo, 2007: 6). In terms of individualism, she added that EFL students tend to be dependent upon the teacher and upon each other. As a result, they tend to have low independence, self-reliance and self-confidence.

The above mentioned constraints need to be overcome properly. Some of the ways to minimize the problems are by cultivating CTS in all levels of education in Indonesia and integrating CT with four language skills. For example by incorporating the CTS with other subjects or language skills, and encouraging the EFL learners to think critically as early age

as possible. If CT is cultivated properly as early as possible, Indonesian students may get used to thinking critically since the beginning. One of the ways to teach CT is by including the last three aspects of Bloom taxonomy of cognitive domain that is analysis, synthesis and evaluation as well as the last two domains of Barrett's taxonomy namely evaluation and appreciation in the question and answer section (Huitt,2004). In cultivating reading habit among the students, teachers could always encourage the students to develop their evaluation and appreciation on a particular topic. For example, instead of asking the literal and comprehension questions, teachers could stimulate questions that involve evaluation and appreciation such as "how about you?", "what will you do if you are in this position?" and so forth. These stimulating questions could raise the students' awareness and develop their thinking level.

Integrating CTS with other language skills such as reading, writing, speaking and listening are proven to yield more effective result as well. Some research findings indicated that activating this skill is proven to be effective in enhancing reading, writing and vocabulary (Crook, 2006; Scanlan, 2006; Niewoehner & Steidle, 2008). In this study, the CTS are integrated with EFL reading due to the demand of mastering EFL reading for academic purposes in higher education (Cahyono & Widiati, 2006; Suharmanto, 2006).

The role of CTS in EFL reading proficiency in this study falls under the need to be able to analyze and to assess source of information in the reading selection. In analyzing, the readers are expected to find both literal and inferential meaning stated in the reading text. While in assessing, the readers should make evaluative judgment to go further beyond the text itself. Such an analysis and evaluation are parts of higher order thinking based on Bloom taxonomy of cognitive domain (Huitt, 2004).

The EFL reading proficiency is rooted from Barrett's taxonomy of reading comprehension which consists of five aspects namely literal comprehension, reorganization,

inferential comprehension, evaluation and appreciation. Literal comprehension focuses on ideas and information which are explicitly stated in the reading selection. Reorganization requires the student to analyze, synthesize, and/or organize ideas or information explicitly stated in the reading selection. Inferential comprehension is demonstrated by the student when he/she uses the ideas and information explicitly stated in the reading selection as a basis for making intelligent guesses/hypotheses. Evaluation requires responses indicating that an evaluative judgment has been made. Appreciation involves all of the above cognitive dimensions of reading, and requiring being aesthetically and emotionally sensitive to the ideas and information in the reading selection.

From the three aspects of cognitive competences, this study is going to find the relationship between IQ and CTS in reading as well as finding the contribution of IQ and CTS in reading on EFL proficiency. Some findings regarding the relationship of these variables are described in the following.

The relationship between intelligence and critical thinking skills indicated that there is no relationship between the two constructs. One finding is revealed by Butler (2012) who argued that critical thinking is what intelligent test fails to adequately measure. This idea echoes the general consensus among the researchers that intelligence and critical thinking are separate constructs and was empirically tested in a series of studies that explored the relationship. Thus, critical thinking and intelligence are separable constructs but share at least one common attribute that they are difficult to adequately assess. This finding is supported by Jauk (2013) who stated that there is still no consensus on how the two constructs, critical thinking and intelligence are related. On the basis of these findings, one of the purposes of this study is to find out how intelligence and critical thinking skills focusing on EFL reading are related.

Different from the not significant relationship between intelligence and critical thinking skills, some studies revealed that there is a significant relationship between intelligence and language proficiency. Shakib (2011) found out that there was a reliable and meaningful relationship between emotional intelligence and language proficiency. Besides, he added that the relationship between students' emotional quotient level and their level of language proficiency was stronger in females than males. In addition, Csapo & Nikolov (2009) supported those findings by stating that there is a significant relationship between inductive reasoning skills and German or English proficiency among Hungarian in educational context. Wray & Fox (2013) also revealed that there is a significant contribution between specific cognitive and language function among young children of seven to eight years old and at their school age. In Indonesian context, Azwar (2010) stated that some studies revealed the significant relationship between IQ test and school achievement, and some others are not. Further, he stated that studies by Wulan, (1986); Pratomo, Purnamaningsih & Harjito (1987); Yuniarti (1988); Suparmi (1991); Budimarwanto (1991) have revealed the significant correlation between IQ test and school achievement in all level of education starting from elementary schools to higher education. Some others, such as the studies by Christianti (1987); Wulan (1986); Purnamaningsih (1987); Utami (1994) found out the not significant relationship between IQ test and school achievement. According to Saukah (2010), there will probably three reasons that make the researcher cannot reject the null hypothesis, first, perhaps because the number of the subject (N) is not big enough, second, the instrument to collect the data is not valid and third, the design of the study is not a right design. On the basis of these findings, this study is going to find out the relationship between intelligence, critical thinking skills in reading and EFL proficiency among English department students.

Besides finding the relationship between intelligence and critical thinking skills and between intelligence and language proficiency, this study is going to investigate the relationship between critical thinking skills and language proficiency as well. Some studies related to this issue are proposed by Bernard (2008) and Lun (2010). Bernard postulated that scores on critical thinking tests have been found to be predictive of or associated with success in a variety of settings for example teaching critical thinking skills, success of educational programs, teaching clinical skills and a variety of abilities for example general academic success. This finding is confirmed by Lun (2010) who proposed that the scores of critical thinking skills significantly predict grade in a university course. In addition, culture does not show effect on the link between scores of critical thinking and grades. From the two findings, it can be concluded that there is a close relationship between skills in thinking critically and language proficiency.

One of the valid instruments to measure adult intelligence (from early adulthood, 20 – 30 years old, to middle adulthood, 30 – 65 years old) is Wechsler Adult Intelligence Scale (WAIS). There are three levels of Wechsler Intelligence scale namely Wechsler Adult Intelligence Scale (WAIS), Wechsler Intelligence Scale for Children (WISC) and Wechsler Preschool and Primary Scale of Intelligence (WPPSI). The Wechsler tests yield three scores: a verbal score, a performance score and an overall score. On the basis of the need of this study, The Wechsler Adult Intelligence Scale (WAIS) is more properly used since it is intended to measure adult intelligence including verbal intelligence, performance intelligence and the overall scores of intelligences. The scores of IQ then is related with the scores of CTS in reading.

In terms of assessing the CTS, one of the most common authentic assessments for CT is using International CT Test. In measuring CTS in reading, the test is in the form of analyzing an article using eight elements of reasoning and assessing an article using nine

intellectual standards. Both of the tests could be assessed using scoring rubric for assessing eight elements of reasoning and for measuring nine intellectual standards constructed by Stonewater and Wolcott (2005). The result of assessment could determine the extent to which the EFL learners have learned to think critically within a discipline or subject (Paul and Elder, 2006). This type of assessment has been conducted by West High School in Nebraska in 2010, and it was proven to be successful to measure the High School students' CT in reading. Using EFL context, this study attempts to adapt the two instruments by giving more specific instruction to measure the CTS in reading among English department students.

The purpose of the International CT test is to provide an assessment of the fundamentals of CT that can be used in any subject. Paul and Elder (2006) stated that there are two goals of the test, firstly, to provide a reasonable way to determine the extent to which the EFL learners have learned to think critically within a discipline or subject, and secondly, to provide a test instrument that stimulates faculty to teach their discipline so as to foster CT in the students.

Another type of international CT test is Assessment Rubric for CT (ARC). It is a type of CT test which is introduced by Stonewater and Wolcott in 2005. This ARC is divided into two parts namely analyzing an article and assessing an article. The analysis is worth 80 points; the assessment is worth 20. In the analysis segment of the test, the student must accurately identify the elements of reasoning within an article given (each response is worth 10 points). In the assessment segment of the test, the student must assess the quality thinking of the writer using nine intellectual standards (the total assessment is worth 20 points).

In order to know the extent to which the EFL learners master CTS, ranging from the grading criteria of advanced, proficient, progressing, and beginning. The International CT Test is the appropriate instrument to measure, as what has already been stated by Paul and Elder (2006:3) in their quotation "The International CT Test is the perfect test to teach. For

one, the structure and standards for thought explicit in the test are relevant to thinking in all departments and divisions”.

The above types of CT tests have already been implemented in some schools in the US. Crook (2006), the principle of West High School in Nebraska relates CTS with reading, writing and questioning skills. He reported that CTS are proven to be successful to improve the High School students’ performance in ACT (Application of CT) and SAT (Standards for Assessing Quality Thinking) tests. Therefore, the staff development program utilizes CT instruction for the High school staff. The instrument which is used to assess the students’ performance is using The International CT Assessment defined by Dr. Richard Paul consisting of two parts. The first part requires students to respond to a series of questions pertaining to articles they have given to read. The second part requires that students write an evaluation of an article using standards to evaluate the quality of the author’s thinking. The eight standards are purpose, question, information, inferences, concepts, assumptions, implications and point of view. Each student paper is double-scored by trained district raters using an analytical rubric. Scores are not expressed as a percent of students hitting a cut-score, but instead as a raw score. The CT Assessment was chosen as a measure of CT due to its content and close alignment with the CT goal. Although these two rubrics are used in high school in English speaking country, these rubrics seem working for EFL students at the university level.

On the basis of these findings, this study is intended to relate IQ with CTS of the pre-advanced EFL learners in reading which is later formulated in the first research problem. There are four levels of CTS according to Paul and Elder (2006) namely advanced, proficient, progressing and beginning. These four levels of CT and reading, then, are associated with English Department students’ scores of intelligences and English Proficiency. The

instrument to measure the students' intelligence is using Intelligence Quotient, further it is called IQ test.

Besides relating IQ with CT scores, this study is also intended to find out the contribution of IQ and CTS in reading to EFL proficiency. The EFL Proficiency of the students is measured by using EFL proficiency test designed by the Faculty of Culture Studies in the University of Brawijaya. The scores of EFL proficiency were obtained from the test administered in February 2012.

With this regard, this study is going to see how IQ relate to CTS in reading, then finding the contribution of IQ and CTS in reading to EFL proficiency, which is further elaborated in the following research problems.

There are two research problems that are going to be discussed in this study. Firstly, how is IQ related to CTS in reading? Secondly, how do IQ and CTS in reading contribute to EFL proficiency?

Regarding the two research problems, the objectives of this study is 1) to find out the relationship between IQ and CTS in reading, 2) to find out the contribution of IQ and CTS in reading to EFL proficiency.

METHODS

The design of the study is ex-post facto. In this study, the researcher tried to establish the co-relational relationship between IQ and CTS in reading, then find out the contribution of both variables to EFL proficiency. The ex-post facto design was appropriate for this study since the IQ and CTS in reading which served as an independent variable could not be manipulated by the researcher. Furthermore, the dependent variables namely the EFL proficiency could not be controlled; therefore, this influence the relationship between IQ and CTS in reading.

The research project was executed by employing IQ test and its correlation with CTS in reading. After finding the correlation, multiple regression is run to find out the contribution of both variables IQ and CTS in reading to EFL proficiency. The former was designed to answer the first research question and the latter the second. With the first question, answers concerning how IQ relates to CTS in reading are described. The way to measure IQ is using WAIS and administered by Psychological Department of Brawijaya University. The scores of CTS in reading are obtained by conducting CTS in reading test ARC developed by Stonewater and Wollcott (2005) on the basis of the construct validity designed by Paul and Elder (2006), and this is one of the standardized tests to measure CTS in reading.

As a second question has to do with the contribution of IQ and CTS in reading to EFL proficiency, the multiple regression is developed. The multiple regression is used to predict a Y score from two X scores, partially and simultaneously. Since both correlation and multiple regression reside within the camp of quantitative types of research (Ary et al, 2002), in general, the research can be referred to as quantitative. The following diagram will describe the relationship among the variables.

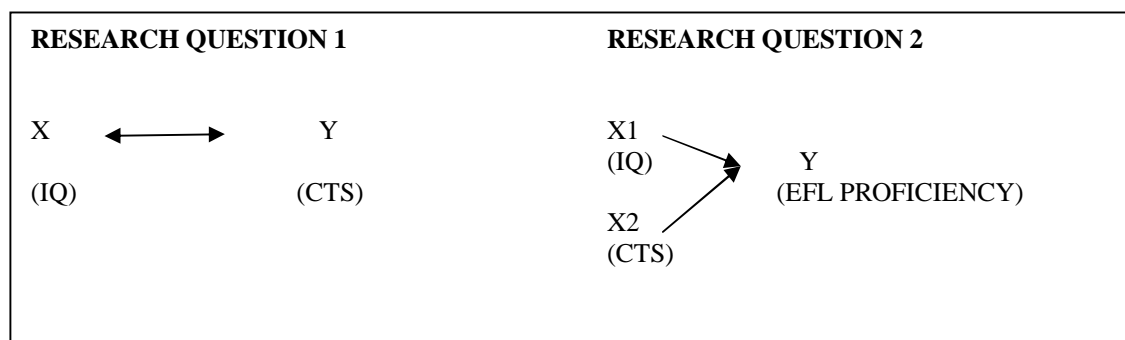


Figure 1 Design of the Study

From the above figure, it can be seen the relationship between the variables. The way to answer the first research question is by running the correlation study between variable X (IQ) and Y (CTS in reading). The second research question is answered by conducting

multiple regression between two independent variables X1 (IQ) and X2 (CTS in reading) and dependent variable Y (EFL proficiency).

The target population of this study is all the third year students of English department. The subject of this study is the third year students of English department at Universitas Brawijaya who have already passed from all reading skill courses such as Basic Reading Skills, Critical Reading and Extensive Reading worth 12 credits. Besides, they are at early adulthood (20-30 years old) period of cognitive development. English department of Brawijaya University in Malang is chosen as the place to conduct the study because the number of students enrolling in Universitas Brawijaya constantly increase from year to year and be the biggest in East Java (Academic documents of Universitas Brawijaya, 2012).

To control the language mastery of higher order thinking, the subjects are selected using purposive sampling of 35 students out of 228 the third year students on the basis of their EFL proficiency scores of at least 500. These 35 samples have already fulfilled the minimum requirement of taking samples that is 10% of the population (Ary et al, 2002). The 228 sixth semester students were given CT tests which were administered once in 90 minute duration of test time. After administering the CT tests, the samples were selected on the basis of their EP scores of 500 as the minimum. Those 228 sixth semester students of English department were divided into 6 classes. On the basis of their EP score of the minimum 500, there were 5 out of 42 students from class A, 8 out of 39 from class B, 4 out of 33 from class C, 10 out of 43 from class D, 4 out of 40 from class E and 4 out of 31 from class F were selected as samples. From this purposive sampling then the 35 samples were selected.

The aim of administering the EP is to select the subjects on the basis of their EP level. According to the guideline of administering TOEFL based on Educational Testing Service (ETS), the TOEFL equivalent score of 500 is considered in advanced level, so when they

have to do the critical thinking test, it is assumed that they have no language problems anymore.

The EP scores of the English Department students in the Faculty of Culture Studies are assessed regularly in the beginning of the semester; therefore the researcher only selects the subjects on the basis of their newest EP results namely the EP scores in the even semester of 2011/2012 period in February 2012.

There are two research instruments used in this study. Firstly, using adapted ARC (Assessment Rubric of Critical Thinking) developed by Stonewater and Wolcott (2005) to measure CTS in reading, and secondly using IQ (Intelligent Quotient) Test developed by the Psychological Department under the Faculty of Social and Political Science of Universitas Brawijaya in Malang, to measure the early adulthood's cognitive skills. The former instrument, ARC has already been tried out to the English department students and it undergoes some changes to be adapted into Indonesian context. There are two kinds of CT test, firstly analyzing an article and secondly, assessing the articles, with the focus on assessing the author's thinking. Each of the tests has four categories of scoring from advanced (> 75), proficient ($>50 - 75$), progressing ($>25 - 50$) to beginning (< 25). After analyzing, the text is assessed using nine intellectual standards to evaluate the author's thinking. The author's thinking is scored using the four categories as well from advanced (20), proficient (15), progressing (10) and beginning (5).

FINDINGS AND DISCUSSIONS

On the basis of the statistical result using SPSS 16; it was found that there is no significant relationship between IQ and CTS in reading. This result was obtained by using Pearson Product Moment Correlation Coefficient scores to find the relationship between two variables IQ and CTS in reading. The p-value was described in table 1.

Table 1 Result of Correlation Analysis

Relationship	Correlation Coefficient	<i>p-value</i>	Interpretation
IQ and CTS in Reading	-0.011	0.949	Not Significant

From table 1, it was seen that the *p-value* of 0.949 is bigger than $\alpha = 0.10$. This value indicated that there is no significant relationship between IQ and CTS in reading. Regarding the second research question, the multiple regression analysis shows that there is no significant relationship between IQ and CTS in reading to EFL proficiency. But the partial analysis indicated that there is a significant relationship between CTS in reading and EFL proficiency. The detailed description is in the following table.

Table 2 The Result of Multiple Regression Analysis

Variable	Std coefficient <i>B</i>	Coefficient β	t_{count}	<i>p-value</i>	Interpretation
Constant		474.514	6.789	0.000	Significant
IQ Variable	-0.056	-0.201	-0.336	0.739	Not Significant
CTS Variable	0.318	0.740	1.900	0.067	Significant
α	= 0.10				
R^2	= 0.105				
R	= 0.323				
F-count	= 1.868				
F-table(0.10,2,32)	= 2.477				
<i>p-value</i>	= 0.171				
t-table (0.10,34)	= 1.691				

It can be seen from table 2 that IQ is not significantly related with EFL proficiency, while CTS has significant relationship with EFL proficiency. The statistical interpretation is the following.

$$EP = 474.514 + 0.740 \text{ CTS} - 0.201 \text{ IQ} + \varepsilon$$

- $\beta_0 = 474.514$

The value of beta coefficient is 474.514 meaning that if IQ and CTS have zero value, the value of EFL proficiency is 474.514

- $\beta_1 = 0.740$

The regression coefficient is positive meaning that both CTS and EFL proficiency move

to the same direction as a sign of the relationship between CTS and EFL proficiency. The higher the CTS scores, the higher the scores of EFL proficiency. The regression coefficient is 0.740, meaning that one unit increase of CTS will be followed by 0.740 unit increase of EFL proficiency.

- $\beta_2 = -0.201$

The regression coefficient is negative meaning that there is opposite direction between IQ and EFL proficiency. The higher the IQ scores will be the lower the EFL proficiency scores. The value of regression coefficient is -0.201 meaning that one unit increase of IQ will be followed by 0.201 decrease of EFL proficiency.

The value of R^2 is coefficient of determination that measures how far the regression model could explain the variety of dependent variable (Y) in 0.105. It means that the obtained regression model could explain 10.5% variable varieties on EFL proficiency (Y). The R value is the correlation that explains the close relationship between independent variable (X) and dependent variable (Y) in 0.323 point.

From the two tables above it can be concluded that IQ has no significant relationship with CTS in reading. This finding verifies the theory proposed by Butler et.al (2012) in which CT skill is what intelligence tests failed to adequately measure because two of them are separable constructs. Thus, based on the finding in this study, a person with high intelligence score does not guarantee that he or she has high CTS and the other way around. Furthermore, Butler et.al also argued that CTS can be taught and explicit CT instruction is more beneficial than implicit instruction. This justifies an understanding that CTS do not depend on intelligence and therefore, these CTS can be cultivated. In addition to Butler, Jauk (2013) argued that there is still no consensus on how the two constructs, IQ and CTS are related.

Regarding the second research problems, there is only one variable (CTS in reading) contribute significantly to the increase of EFL proficiency. This finding verifies some theories from

Bernard (2008) and Lun (2010) that scores on critical thinking tests have been found to be predictive of or associated with success in a variety of settings for example teaching critical thinking skills, success of educational programs, teaching clinical skills and a variety of abilities for example general academic success. In addition, the scores of CTS significantly predict grade in a university course.

Regarding the less significant relationship between IQ and CTS in reading and IQ and EFL proficiency, again, the number of the students joining the test need to be taken into consideration, because the more the number of the subjects, the more significant the result will be.

In conclusion, the insignificant relationship between IQ and CTS in reading, and IQ and EFL proficiency could be caused by the reasons that IQ scores have nothing to do with critical thinking skills and EFL proficiency. The significant relationship between CTS in reading and EFL proficiency brings new horizons that CTS in reading could be taught to increase EFL proficiency without being interfered by IQ scores.

This study has some limitations regarding the number of the subjects used in this study which are not big enough or just adequate and very homogeneous as well. It is in accordance to what Saukah (2010) has already stated that there will probably two reasons that make the researcher cannot reject the null hypothesis, first, perhaps because the instrument to collect the data is not valid and second, the design of the study is not a right design. When similar study is conducted in bigger subjects without limiting the scores of the English proficiency, it may result in different findings.

CONCLUSIONS

Regarding the relationship between IQ and CTS in reading, there are two conclusions that can be made such as the following:

- a. The insignificant levels between IQ and CTS in reading are due to the reasons that both come from separable constructs.

- b. The positive and significant relationship between CTS in reading and EFL proficiency means that the CTS in reading have been found to be predictive of or associated with success in general academic success.

Thus, in general, it can be concluded that CTS in reading determines academic success and it is not related with IQ scores. In addition, the CTS in reading can be used by pre-advanced EFL learners to analyze and assess information to identify the weaknesses of argument using certain standards or criteria.

On the basis of the findings, the pedagogical implication of the study is that the ability to read critically is not influenced by IQ. Therefore, no matter how high or low IQ, can the EFL learners read any text critically. In addition, CTS in reading can be taught to increase the scores of EFL proficiency. Therefore, it is suggested for all of the EFL teachers and curriculum developers to include CTS in reading in the curriculum and material development to increase EFL proficiency.

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