

Investigating Critical Thinking In Solving Reading Problem

Gadis Dinda Finissha

Universitas Muhammadiyah Gresik, East Java, Indonesia

gadisdinda27@gmail.com

Yudhi Arifani

Universitas Muhammadiyah Gresik, East Java, Indonesia

yudhi_arif@umg.ac.id

Candra Hadi Asmara

Universitas Muhammadiyah Gresik, East Java, Indonesia

candrafkip@umg.ac.id

Received: 22 August 2021

Accepted: 29 August 2021

Published: 1 September 2021

Abstract

The capacity of think critically is needed for student in learning process because it necessary in this era. Student in this era expected to solve problem in learning process use critical thinking especially in reading. So, in this research “how the process of critical thinking can solve reading problem” become the goal of this study. This study focus on 6 sub-skills of critical thinking based on (Facione, 1990) : interpretation, analysis, inference, evaluation, explanation and self regulation. PISA also conduct in this study for assesment .

Descriptive research with qualitative approach apply in this study. Data was collected through a test and interview with all student. Researcher use PISA test to know how student can solve reading problem in comprehension, there are 6 question to analyze 6 sub-skill student critical thinking. The research data was taken from PISA test 2019 and then interview for analyze student process in critical thinking. This research involved 39 students consist of 5 male and 34 female. The subject is student in Thesis and Research Report class University of Muhammadiyah Gresik.

The result is student has different way to solve reading problem, student can give different reason for answer the question and student has different analyze for answer question. Several student find way to think critically, such as through find important point of text for think critically, find the keyword of text for comprehend text and then think critically. Reading strategy and type of reading also influence student comprehension. In further research it can be applied on offline class and use the newest PISA test. The subject in further research can apply in group discussion and using quantitative research.

Keywords: *Critical Thinking; Reading Problem; PISA*

1. Introduction

Critical thinking skill become one of skill that student need in this era. It causes the skill make our thought deeper and for academic field it can help for process the information (Cottrell, 2017). Academic field, especially for student to think deeply and solve the problem is necessary in learning process. Student not just answer question from



teacher but Student need to analyze and solve the problem in learning. It is involve with imaginative, sensitive and creative thinking (McPeck, 2016). There is any correlation among think of creative and think to critical, creatively is process to construct and critically is process to review so, the mind when thinking well must produce and assess at the that time (Paul & Elder, 2007). Critical thinking is the one of higher-order thinking skills that facilitate someone to make a decision and with a proper action (Ennis R. H., 2011). Everyone need to observe any information they get from outside critically and the way to observe information is through reading. Reading can help learning process because student able to develop their critical thinking, improve new and different perspectives, know themselves and other, and analyze situations they will face (Karadeniz, 2015), because the correlation among critical thinking and reading is for build view of reading (Anderson & Pearson, 1984) (Rumelhart, 1977) (Spiro, Bruce, & Brewer, 1980)

One of problem in reading is comprehension (Swerling, 2015). Comprehension is a complicated perceptive, motivational & affective activity and for comprehend text material, reader need to capable for know the words used to deliver meaning, and reader can build meaning when they identify word in text reading (Torgesen, 2000). Some factors that influence reading comprehension is vocabulary, knowing of content, knowing text structure, thinking and reasoning skills, capability to use reading comprehension strategy, motivation and interest (Torgesen, 2000).

Several expert have conducted studies related critical thinking skill and comprehension reading problem such as (Ardhian, Ummah, Anafiah, & Rachmadtullah, 2020) show using appropriate technique can improve reading comprehension skill in student who have high critical thinking skill, (Idol, 1987) show that a mapping strategy of critical thinking can improve reading comprehension, (Khamkhong, 2018) show that PRF-based reading practices were effective in improving the students' reading and critical thinking skills.

Review of previous study related with critical thinking also conducted in different subject, such as analyzing critical thinking of mathematic by (Basri, Purwanto, As'ari, & Sisworo, 2019), the efficiency critical thinking in math by (Su, Ricci, & Mnatsakanian, 2016), the effect of cooperative learning supported by reflective thinking activities on student critical thinking skill by (Erdogan, 2019). But the research above still not discussed the process of critical thinking in solving reading problem.

Several expert give different opinion in component for measure critical thinking skill. According Ennis, component of think critically skills based on FRISCO consist of focus, reason, inference, situation, clarity and overview (Nilson, Fetherston, & McMurray, 2014). It use for make sure for "reaching a decision about what to believe or do" (Ennis, 1991). Other opinion state, five dimension of critical thinking is reasoning in verbal, analysis of argument, thinking as hypothesis testing, likelihood and uncertainty, and decision making and problem (Halpern, 2012). She state that assessment in critical thinking need multidimensional. Based on Facione there are six component of critical thinking skills is interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione, 1990). This study, researcher expand critical thinking problems based on sub-skills by Facione because it more appropriate for assess student critical thinking in reading problem. The researcher wants to know: "How the process of critical thinking can solve reading problem ? "

a. Critical Thinking

Everyday we faced much of uncertain information. Student need to control their own minds for understanding the deepest value in order to take action that contribute for their self and other (Paul & Elder, 2007). This research was conducted to check learners skill in their skills of critical thinking. It is important to know that the term of "skill" can be used in a various meaning as a importance, in some case "skill" is used to indicate that the ability of someone in answer the question (Bailin, Case, Coombs, & Daniels, 2010). The student ability that researcher want to know is critical thinking. There are various definitions of critical thinking, but basically it relates with the way someone in deciding what to do or to believe by focusing someone opinion on it (Norris & Ennis, 1989). (Ennis R. H., 1962) also define that critical thinking is how to assess of statement correctly. (Mertes, 1991) added critical thinking is process that used for define or assess information with appropriate action. Not only we should know about explanation of critical thinking but we must also know the purpose of critical thinking. The purpose of critical thinking according (Maiorana, 1992) is to get understanding, evaluate viewpoints, and solve problems. So in their personal lives, student can solve problems to make effective decision and student have to think critically.

The puposes of assess critical thinking according (Ennis R. H., 1993) is diagnosing the levels of student critical thinking, give feedback of ability the student critical thinking skill, give motivation students to improve critical thinking skill, giving information to teachers about the achievement of their work to teach students to think critically, doing study about critical thinking instructional questions and issues, providing help in deciding

whether a student should enter an educational program and providing information for holding schools accountable for the critical thinking skill of their students.

The characteristics of critical thinking according (Wade, 1995) are, Critical thinking involves 1)asking questions, 2)defining a problem, 3)examining evidence, 4)analyzing assumptions and biases, 5)avoiding emotional reasoning, 6)avoiding oversimplification, 7)considering other interpretations and 8)tolerating ambiguity

Then, some of expert define the component of critical thinking such as according Ennis, component of critical thinking skills as FRISCO consist of Focus (identify the focus or main concern), Reason (identify and assess the reasons reception), Inference (judge the inference quality, analyze the reasons to be acceptable), Situation (pay tight attention on the situation), Clarity (makesure that the language is clear) and Overview (step back and look full scale) (Nilson, Fetherston, & McMurray, 2014). It use for make sure for “reaching a decision about what to believe or do” (Ennis R. , 1991). The other component of critical thinking based on Facione, six component of critical thinking skills is interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione, 1990) and the definitions of component sub-skill critical thinking by (Facione, 1990) :

- (1) Interpretation: To comprehend and explain the meaning
- (2) Analysis : To identify relationship between opinion, problem, idea, and view
- (3) Evaluation : To assess something that can trusted of opinion
- (4) Inference : To recognized and safe elements that needed to get reasonable conclusions; to make hypotheses from statements, opinions, concepts, descriptions, questions, or other forms of representation
- (5) Explanation : To state the results of someone reasoning and to present someone idea in the sahep of strong arguments.
- (6) Self- regulation : Self-consciously to control someone cognitive activities especially using skills in analysis and evaluation based on questioning, confirming, validating, or correcting either someone reasoning or results.

The study of (Basri, Purwanto, As'ari, & Sisworo, 2019) researchers develop critical thinking problem based on the sub skills proposed by Facione because it was considered more suitable for measure students' critical thinking skills in mathematics course, but there is still limited using thus concept for critical thinking in reading problem. Human tendency to communicate and interact is not a phenomenon that emerges recently. These symptoms appear in line with the development of human civilization. Whether for the motive of developing power, politics, survival, and slavery; it has been a long time since humans are out of their closest social environment. This is what leads to the mobility of one people from another region, both in the form of individuals/families and in large waves.

b. Reading Comprehension

Reading is the capable of people to get meaning from written form and interpret the information clearly (Grabe, William; Stoller, Fredricka L, 2019). Reading become something that involve in each aspect at our daily life. In modern era we read all the time in around of us and we use it in many more (Grabe, 2009). In our daily life we can find basic form of reading such as newspaper, magazine, advertisement, message and etc. We read when we receive message, we read when we watch TV, we read when search information in internet and many more activity involve with reading.

When we start reading something, actually we have purpose why we are reading. The goal of reading based on (Grabe, William; Stoller, Fredricka L, 2019) classified be seven purposes : 1) Reading to search simple information 2) Reading to skim quickly , 3) Reading to learn from texts, 4) Reading to integrate information, 5) Reading to write (for writing), 6) Reading to critique texts, and 7) Reading for general comprehension.

Reading involves an interative process which is reader can produce meaning actively through of a set mental process. The process involves construct the meaning between text and readers experience (Shihab, 2011). Reading without thinking is not possible (Shihab, 2011) and Critical thinking allows readers to monitor their comprehension as they read (Goertel, 2018). Goertel also state to think critically about a reading text, reader must know how to take a critical stance, it means they are able to question about the text and involve their own opinion as they construct meaning (Goertel, 2018)

One of language skill that must develop in Indonesian school is reading comprehension because understanding reading become something important and needed for student because the success of student mainly depend on their ability to read (Ardhian, Ummah, Anafiah, & Rachmadtullah, 2020). The ability to represent message from text happen from comprehension of reader (Perfetti, Landi, & Oakhill, 2005). Reader capable to understand and master the text. For understand of the reading content well, it is necessary to have ability to think critically. So with reading,

student expected can get various information, including content of text and understand meaning of reading (Ardhian, Ummah, Anafiah, & Rachmatullah, 2020). For understanding text, knowledge about word choice that is less appropriate can influence reader because if reader not clear the word it will affect in definition of reading (Child, Cirino, Fletcher, Willcutt, & Fuchs, 2019). We can conclude that the definition of reading comprehension is a skill to extract meaning or learn something from written form (Snow, 2002). Other definition of reading comprehension is activity that involve get and build the meaning in which organizing memory become important process (García-Madruga, et al., 2013) Based on several definition of reading comprehension we can say that reading comprehension is activity on reading to understand content of reading text in explicitly and implicitly from reading text.

Reading comprehension became a skill in reading that important for student and can not be negotiable (Oakhill, Cain, & Nesi, 2016). (Ardhian, Ummah, Anafiah, & Rachmatullah, 2020) added that skill in reading comprehension as a interaction process between readers and texts in reading activity & the activity concern on skill and understanding the content of text that they read. (Khamkhong, 2018) added to interpret a text, reader must be able to comprehend and for criticize the text, reader be able to interpret it first.

There are 3 level on reading comprehension : literal comprehension, inferential comprehension and evaluative comprehension (Basaraba, Yovanoff, Alonzo, & Tindal, 2013). More specifically, in literal comprehension tasks readers need to simply get explicit information in a passage (Carnine, Silbert, Kame'enui, & Tarver, 2010). Next level is inferential comprehension, this level need reader for understand relationships that may not be explicitly stated in the passage but are important for passage understanding, such as the connection between two events in a narrative or understanding a character's reason for a particular action (Applegate, Quinn, & Applegate, 2002). The last level is Evaluative comprehension tasks readers need to analyze and critically interpret the text based on their prior knowledge and experiences (Basaraba, Yovanoff, Alonzo, & Tindal, 2013)

The critical skill that needed for student to be success in school is reading comprehension (Watson, Gable, Gear, & Hughes, 2012). (Snow, 2002) added that to comprehend text, reader must have wide range of capacities and abilities. It include cognitive capacities such as attention, memory, inferencing, visualization ability and critical analytic ability. Be great in class, students are need to read widely for knowledge and information from textbooks, research articles & other sources and also think critically about what they have read (Khamkhong, 2018)

c. PISA (Programme of International Student Assessment)

PISA (Programme for International Students Assessment) is program that design for student start from 15 years old. PISA is collaborative product between OECD and the governments of both OECD countries and it is partner of countries/economies (OECD, 2019). The focusing on young people who have skill and knowledge that important for participant in real life modern era (OECD, 2018)

The assessment not only to makesure the student can increase their knowledge but to know how well student can apply knowledge in real life (OECD, 2019). The assessment held in every 3 years start from 2000 so in 2018 is seventh cycle. The stress is on mastering processes, understanding concepts and function in every situations and assessment area (OECD, 2010) The assessment focuses 3 on the subject matter on school of science, mathematics and reading. The PISA 2018 reading test adopted and adaptive approach, wherein students were assigned units based on their performance in previous units and reading structure developed by reading expert group (OECD, 2018). Reading in PISA's definition is the ability to identify and understand the role that reading plays in the world, to make reasonable judgments and involve with reading that use for make ends meet as a constructive, concerned and reflective people (OECD, 2003). Reading is not only as ability that student get in childhood during early school, reading seen as a set of knowledge, skill and strategy that someone use to interact with someone else or community (OECD, 2018). The point of PISA is reading to learn than learning to read and students are assessed on higher order thinking skills (Brozo, Shiel, & Topping, 2008). The skill for reading, articularly the interpretation, integration, reflection, and evaluation abilities, require critical thinking skills (Khamkhong, 2018). The aim of PISA also to examine learning strategies and problem solving competencies in different topics (OECD, 2010). The types of reading tasks that students are asked to perform include (1) Retrieving information by locating information on text for forming wide understanding, (2) Developing an interpretation by constructing meaning and draw conclusion based on information from text, (3) Reflecting on the content and structure of text connected with their experience, knowledge and evaluate idea critically (Brozo, Shiel, & Topping, 2008).

PISA was launched in 2000 and this program held every three years. In PISA 2018, reading was the major domain of assessment, as it was in 2000 and 2009 (OECD, 2019). So in this study researcher conduct PISA 2018. The 2018 framework defines four dimensions of texts: source (single, multiple); organisational and navigational structure (static, dynamic); format (continuous, non-continuous, mixed); and type (description, narration, exposition, argumentation, instruction, interaction, transaction). There are 3 aspects text in PISA 2018 : 1)Locating Information, 2)Understanding, 3)Evaluating and Reflecting (OECD, 2019). (Khamkhong, 2018) also conduct his study using PISA on Thai EFL learners for develop English L2 Critical Reading and Thinking Skills

2. Research Method

a. Research Design

This study uses descriptive research with a qualitative approach. The goal of qualitative descriptive as (Lambert & Lambert, 2012) is for summarization widely, in daily terms, of particular event that individual or group of individual experiences. (Malgilvy, 2003) add that the goal is to produce clear description and deep understanding of interesting phenomena and natural experience life of people. In a qualitative study, the researcher is the instrument of research, data obtained from asking questions in personal interviews or focus groups, making observations and recording notes, or taking photographs (Magilvy & Thomas, 2009). In this study, researcher describe the critical thinking skill of university student in reading problem.

b. Subject

The subjects of this research are students in Universitas Muhammadiyah Gresik in Thesis and Research Report class. Material in this class involve high order thinking skill (critical thinking). The research subject were 39 student, consisting of 5 male students and 34 female students. The age between 20-24 years old.

c. Instrument

The first PISA survey in 2000 and reading was the major domain in 2000, 2009 and 2018 (OECD, 2019). The differences PISA 2018 with previous is involved basic reading processes, such as fluent feading, literal interpretation, inter-sentence integration, extraction of the central themes and drawing inferences, are critical skills for processing complex or multiple texts for specific purposes. So this study uses PISA (Program for International Student Assistance) 2018. PISA not only to know student performance in reading, also science and mathematics. PISA try not only to assess whether student can reproduce knowledge but also to check how well the student can understand from what they have learned and implement in unfamiliar setting in and out of school (OECD, 2010). This study also used interview based on (Facione, 2015) to analyse student critical thinking in every sub-skills. The instrument of the critical thinking test given to the students are presented in table below :

Table 1 : The Description of Critical Thinking Test

No.	Critical thinking sub-skills	Indicator	Amount of item
1	Interpretation	Students can understand and express the meaning of the given statement	1
2	Analysis	Students can analyze the given arguments	1
3	Inference	Students can provide inferences with logical reasons	1
4	Evaluation	Students can assess the given claim	1
5	Explanation	Students can explain their answer	1
6	Self-Regulation	Students can find the mistake in solution of the problem	1
Total items			6

Adapted from (Basri, Purwanto, As'ari, & Sisworo, 2019)

d. Data Collection

Data collection on the subject of the study is sequently, one by one. Researcher share the question PISA reading section in online application. The answer will send back on online application for analyzing by researcher.

After that researcher will interview all students to know how the process of critical thinking. All subject activities at solving reading problems were recorded.

e. Procedure

Researcher conduct data collection for 2 meetings and using PISA reading section 2018. Each questions has 1 question with different level and the type is multiple choice & open response. The reading text has different topic and different aspect depend on goal to assess. Each question contain 1 sub skill of critical thinking that researcher want to know interpretation, analysis, inference, evaluation, explanation and self regulation by (Facione P. A., 1990). So, total of question is 6 as the sub skills. This study involve 39 university student in 7TH semester aged between 20-24 years old. The test should finish in 50 minutes. The student answer assessed based on the researcher rubric. In addition, interview will conduct gradually with student for 30 minutes after student answer the question (Basri, Purwanto, As'ari, & Sisworo, 2019)

f. Data Analysis

Based on (Basri, Purwanto, As'ari, & Sisworo, 2019) data analysis conducted through 3 stages :

- (1) The result data from the test and interview reduced by selecting important data and eliminatin useless data,
- (2) The additional in several test and interview result will describe in six part :
 - a. The critical thinking skills of student in the interpretation sub skills
 - b. The critical thinking skills of student in the analysis sub skills
 - c. The critical thinking skills of student in the evaluation sub skills
 - d. The critical thinking skills of student in the inference sub skills
 - e. The critical thinking skills of student in the explanation sub skills
 - f. The critical thinking skills of student in the self-regulation sub skills
- (3) Conclude the data findings

3. Findings and Discussion

a. PISA Test

Researcher focus on how the process student to answer question with critical thinking in PISA test. Researcher want to know how the process based on their answer. The answer from subject is different, some of them state that PISA test is difficult and the other state that actually not difficult but need to deep analyze for answer the question. But several student state question number 5 difficult to understand. Every student have different difficulties when read of reading text, but every student definitely has unfamiliar word and all of them not open their dictionary to find the meaning. So when they don't know the vocabulary they guess point of the text based on sentence. The other finding is strategy reading that they use when read is they just scanning and skimming text. Some of them get the point from text when use this technique but the other can't get point of text. Several question has more 1 reading text, students are not careful in read questions so they are still confused which reading refers. Based on interview that researcher conduct in this research, subject state that after they read all reading text they get some surprising information.

b. Interview

This research reveals the solve reading problem in PISA 2018 using student critical thinking in PISA reading text. Students are asked to try how to solve the problem based on the text, comprehend the text, understand the problems that are in the text, think critically, and give a reason based their answer. After doing the test, researcher conduct interview to analyze their critical thinking

process and this is the result of interview based on the answer from student consist of 6 sub-skill of critical thinking.

Question 1 : Interpretation

The indicator of critical thinking in sub-skill interpretation is student know and express the meaning of the statement. First question is multiple choice with reading text The researcher give introduction for illustrate the situation so the student can imagine this situation. Then student read the text about “The Professor’s Blog”.

Based on student who has incorrect answer, when researcher ask to them for telling about text, they have simple answer. They actually didn’t read all the text, they say that just scanning and skimming during reading text and they don’t understand at all actually. They look question first and read only some part and they know the answer on the text but they found the answer in the incorrect part. So the purpose of their reading is reading to search for simple information and reading to skim quickly. Total of student who has incorrect answer is 8 students.

The analysis result in the interpretation sub-skills on student who has correct answer, they can give reason why they answer “Nine Months Ago”, they can find the evidence from text in 2nd paragraph in last sentence and subject understand about this text. Total of student who has correct answer is 9 students.

Question 2 : Inference

The indicator of critical thinking in sub-skill inference is student can provide inferences with logical reasons. Second question is complex multiple choice with reading text and student asked to choose fact or opinion based statement on question. The reading text still related with reading text in number 1 and the title of reading text is “Review of Collapse”.

Based on student who has incorrect answer, when researcher ask to them for telling about text, they have simple answer. They don’t really understand the story, don’t understand about text. They answer just based on text but not critically it is fact or opinion and give simple reason. The type of question number 2 is complex multiple choice and there are 5 statement. Total of student who has incorrect answer in 1st statement is 6 students, 2nd statement 9 students, 3th statement is 8 students, 4th statement all of them has correct answer and 5th statement is 3 students.

The analysis result in the inference sub-skills on student who has correct answer, they can give reason why they answer “Fact” or “Opinion” and they can tell again about this text. Student can analyze it is fact or opinion based on word that author use in the text. Total of student who has correct answer in 1st statement is 10 students, 2nd statement 7 students, 3th statement is 8 students, 4th statement is 16 students and 5th statement is 13 students.

Question 3 : Evaluation

The indicator of critical thinking in sub-skill inference is student can evaluate the given claim. The third question is complex multiple choice with reading text and student asked to choose yes or no based statement on question. Student asked to choose the statement is represent the purpose of the article or not. The title of reading text is “Just Say No To Cow’s Milk”.

Based on student who has incorrect answer, when researcher ask to them for telling about text, they have simple answer. They don’t really understand the story, don’t understand about text and they think that the vocabulary little bit difficult. They think that all of statement represent purpose of article but actually no. The other problem is student still confuse the statement based on which article but actually in question already mentioned. The subject still doubt and change their answer also after reread the text. Student just read the point not all the passage so they not really understand. Total of student who has incorrect answer in 1st statement is 4 students, 2nd statement 3 students and 3th statement is 7 students

The analysis result in the evaluation sub-skills on student who has correct answer, they can give reason why they answer “Yes” or “No” and they can tell again about this text. All of them read text to understand the content because it related with the statement. Total of student who has correct answer in 1st statement is 13 students, 2nd statement 14 students and 3th statement is 10 students.

Question 4 : Explanation

The indicator of critical thinking in sub-skill inference is student can explain their answer. The fourth question is open response based on “Just Say No To Cow’s Milk “ text. Student asked to explain the meaning of “surprise” based on text.

Based on student who has incorrect answer, student not understand meaning of “surprise” refer on what and they can not find it on the text. Actually they don’t read all the text. Total of student who has incorrect answer is 7 students.

The analysis result in the explanation sub-skills on student who has correct answer, they understand meaning of “surprise” and can indicate which sentence the referrer is. Total of student who has correct answer is 10 students.

Question 5 : Analysis

The indicator of critical thinking in sub-skill analysis is student can analyze the given arguments. The fifth question is complex multiple choice based on “Just Say No To Cow’s Milk “ and “Farm to Market Dairy” text. Student asked to choose fact or opinion based on statement on table.

Based on student who has incorrect answer, student not analyze based on their own answer but based on whether or not the statement is in the text so they can’t analyze by their self . Some student have correct answer but the reason is not quite right. They not completely read all of text, even though this statement based on 2 reading text and to know their understanding, researcher ask them to give conclusion of text. Total of student who has incorrect answer in 1st statement is 10 students, 2nd statement 4 students, 3th statement is 8 student and 4th statement is 4 students.

The analysis result in the analysis sub-skills on student who has correct answer, they can analyze statement fact or opinion and give reason with evidence. Total of student who has correct answer in 1st statement is 7 students, 2nd statement 13 students, 3th statement is 9 student and 4th statement is 13 students.

Question 6 : Self – Regulation

The indicator of critical thinking in sub-skill self-regulation is student can find the mistake in solution of the problem. The last question is complex multiple choice based on 3 reading text about “The Galapagos Islands“. Student asked to choose yes or on based on statement on the table.

Based on student who has incorrect answer, student think that the statement is aspect of credibility. Some student has correct answer but the analyze is quite right. Researcher add 1 question to make sure that they really understand or not with “credibility”. They know the meaning but can not define the statement is credibility or readability. Total of student who has incorrect answer in 1st statement is 14 students, 2nd statement 7 students, 3th statement is 8 student and 4th statement is 3 students.

The analysis result in the self-regulation sub-skills on student who has correct answer, they can analyze statement fact or opinion and give reason with evidence. Some student also analyze based on the sentence context. Total of student who has correct answer in 1st statement is 3 students, 2nd statement 10 students, 3th statement is 9 student and 4th statement is 14 students.

Discussion

The finding from all subjects showed that there are several analysis in critical thinking process of students. They can solve problems in reading where the text is taken from PISA reading text 2018 but the other one have difficulty to analyze. Each student are able solving the problem in a different way. First step is researcher ask them to answer question in PISA test. After they submit answer sheet, researcher continue with interview student one by one to analyze process of their critical thinking. Researcher analyze the process of critical thinking based on their answer either wrong or right answer and researcher also want to know the reading comprehension.

Interpretation is one of the critical thinking sub-skills (Facione, 1990). In this sub-skill based on the results of researcher finding and interview, student who has good analysis can understand contain of text because they read whole of text and they can show the evidence from text. This finding in line with (Torgesen, 2000) that knowing of content and reasoning skill of student can influence reading comprehension. So they can think critically about the answer. The previous study by (Idol, 1987) also find that student can improve critical thinking through reading comprehension in important point of reading text.

But for student who has incorrect answer, they just scanning and skimming reading text so they find the wrong answer because they not really understand. This finding in line with (Klingner, Vaughn, & Boardman, 2007) that reader’s reading strategies can influence reading comprehension. In scanning, readers look at specific information such as dates, place, name and others (Yusuf, Yusuf, Yusuf, & Nadya, 2017). The procedure of scanning based on (Olson & Ames, 1972) are : 1) Focus on particular information will be search, 2) Make choice, which clues will support required information, 3) Read quickly for find the clues and if the clues found, read the part of text for find information that you need. Student apply this procedure, but student can not make choice which clues will support required information so they have incorrect answer. On the previous study by (Yusuf, Yusuf, Yusuf, & Nadya, 2017) this procedure can improve student reading comprehension.

Inference is one of the critical thinking sub-skills (Facione, 1990). In the sub-skill based on the results of researcher finding and interview, student who has good analysis can give reason and they analyze based on keyword from the text. (Broek & Kremer, 2000) made connections between inference-making and critical thinking to advance reading comprehension. They presented the idea, that decision and reasoning skills are closely related to characteristic of readers and skills that affect text comprehension. The previous study also find by (Burns, Hodgson, Parker, & Fremont, 2011) state keyword had significant affect for student comprehension.

For student who has incorrect answer, they don’t really understand the story, don’t understand about text. They answer just based on text but not critically and based on their opinion. So, student not involve one of characteristic of critical thinking according (Wade, 1995) student not analyzing assumptions and biases, they just analyze based on their opinion without appropriate reason. Even though as (Arju, 2010) researcher find if student have opinion about some issue and they analyze in deep, it make their critical thinking improve.

Evaluation is one of critical thinking sub-skills (Facione, 1990). In the sub-skills based on the result of researcher finding and interview, student who has correct answer they can give reason and tell about text. Student interest with text so they can comprehend contain of text. As (Klingner, Vaughn, & Boardman, 2007) state that interest topic and readers' background knowledge can influence student reading comprehension. The previous study of (Arju, 2010) also find that interest topic can improve student critical skill.

For student who has incorrect answer, they don't really understand the story, don't understand about text so they can't think critically, this finding in line with (Watson, Gable, Gear, & Hughes, 2012) critical skill needed for student to be success in reading comprehension. The other problem is they think that the vocabulary little bit difficult. We know that vocabulary is one of factor can influence reading comprehension (Torgesen, 2000). Even though the previous study (Kamali & Fahim, 2011) find, the level of critical thinking student can improve if they can comprehend text when faced with unknown vocabulary items.

Explanation is one of critical thinking sub-skills (Facione, 1990). In the sub-skills based on the result of researcher finding and interview, student who has correct answer they understand meaning of keyword from text. Keywords were defined as "the main to understanding the meaning of the reading part" (Rousseau & Tam, 1991). In previous study by (Rello, Saggion, & Yates, 2014) find that keyword in the text increase the comprehension.

For student who has incorrect answer, they don't understand keyword on text so they can't answer the question. (Liang, 2014) on his finding of research show that using keyword had a positive effect on the reading comprehension performance of reader. So we can say, keyword influent reading comprehension.

Analysis is one of critical thinking sub-skills (Facione, 1990). In the sub-skills based on the result of researcher finding and interview, student who has correct answer they can analyze statement with reason and evidence. It in line with (Wade, 1995) that one of characteristic critical thinking is examining evidence and analyzing assumption & biases. Student match the statement with text for answer question. In previous study by (Poce, Corcione, & Iovine, 2012) find critical thinking skill can increase reasoning ability using reading text

For student who has incorrect answer, student can not give reason and think critically. This finding supported by (Beck, 1989) "there is no reading without reasoning". The component critical thinking sub-skill based on (Facione, 1990) analysis is to identify relationship between statement, question, concepts and description but student can't identify the relation statement on question with description on the text. The previous study by (Firdaus, Kailani, Bakar, & Bakry, 2015) find using appropriate method effectively helps student develop critical thinking skills of information analysis.

Self-Regulation of critical thinking sub-skills (Facione, 1990). In the sub-skills based on the result of researcher finding and interview, student who has correct answer they can analyze based on context of sentence. It in line with (Briggs, Austin, & Underwood, 1984; Simpson, Lorschach, & Whitehouse, 1983) when they find unfamiliar word, they tend to rely too much on guessing the word based on the context or meaning of the passage. Based on Yang (2009) that one of advantage of contextual guessing technique is can develop the students critical thinking.

For student who has incorrect answer, student can not distinguish word credibility and readability so their analysis is wrong. This is be in accordance with (Harmer, 2001) without the right kind of preexisting knowledge, comprehension becomes much more difficult. Because reading comprehension is critical skill that student need to be work out in school (Watson, Gable, Gear, & Hughes, 2012). Actually student have different concept of "credibility" so they can't analyze critically. As previous study by (Oliveras, Marquez, & Sanmarti, 2011) find activity critical reading with analyze can help student to connect different concept they learn in class with analysis on the real life

4. Conclusion

The conclusion based on the finding that researcher showed is all student has different ability to solve problem and student also has different way to analyze problem. Student who has good analyze can give reason based on their answer with evidence they find in the text. The other student difficult to analyze the answer, sometime they can answer correctly but the way they analyze still less precise.

Several student find way to think critically, such as through find important point of text for think critically, find the keyword of text for comprehend text and then think critically, interest topic also influence critical thinking of student, reasoning skill of student influence the critical thinking skill and knowing context help student think critically.

The comprehension of student also different, it is depend on reading strategy that they use in reading text. Some student use scanning and skimming strategy to read the text and they can get the point of text but the other can't get the point because they not really understand the storyline of text. It cause they read some part of text not the whole of text. Even so, there are also student who read all text so they can explain more detail about the text. Misunderstanding of concept also influence their critical thinking

Style in student answer the question also different. The first type is they read all text first to understand contain of text and then they look the question. The second is they look question first and then find the answer in text so they not really read all the text.

Suggestion

In further research it can be applied on offline class, in order to interviews can conducted after students have worked the test so they still remember the answers because some student forget about their analyze. Then you can conduct the newest reading PISA test 2021. The subject in further research can apply in group discussion and using quantitative research

5. References

- Anderson, C. R., & Pearson, P. D. (1984). *A Schematheoretic View of Basic Processes in Reading* (P D Pearson ed.).
- Applegate, M. D., Quinn, K. B., & Applegate, A. J. (2002). Levels of Thinking Required by Comprehension Questions in Informal Reading Inventories. *The Reading Teacher* , 174-180.
- Ardhian, T., Ummah, I., Anafiah, S., & Rachmadtullah, R. (2020). Reading and critical thinking techniques on understanding reading skills for early grade students in elementary school. *International Journal of instruction*. doi: <https://doi.org/10.29333/iji.2020.1328a>
- Arju, S. (2010, April). Proposing Opinion Writing as a Practice of Critical Thinking. *The Reading Matrix*, 106-114.
- Bailin, S., Case, R., Coombs, J. R., & Daniels, L. B. (2010). Coomon Misconceptions of critical thinking. *Journal Of Curriculum Studies* .
- Basaraba, D., Yovanoff, P., Alonzo, J., & Tindal, G. (2013). Examining the Structure of Reading Comprehension:Do Literal, Inferential, and Evaluative Comprehension Truly Exist? *Reading and Writing* .
- Basri, H., Purwanto, As'ari, A. R., & Sisworo. (2019). Investigating Critical Thinking Skill of Junior High School in Solving Mathematical Problem. *International Journal of Instruction* .
- Beck, I. L. (1989). *Reading and Reasoning*.
- Broek, P. V., & Kremer, K. E. (2000). *The Mind in Action: What It Means to Comprehend During Reading* (B.M. Taylor, M.E. Graves, P.V.D. Broek ed.).
- Brozo, W. G., Shiel, G., & Topping, K. (2008). Engagement in reading: Lessons learned from three PISA countries. *Journal of Adolescent & Adult Literacy* .
- Burns, M. K., Hodgson, J., Parker, D. C., & Fremont, K. (2011). Comparison of the Effectiveness and Efficiency of Text Previewing and Preteaching Keywords as Small-Group Reading Comprehension Strategies with Middle-School Students. *Literacy research and Instruction*, 241-252. doi:10.1080/19388071.2010.519097
- Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2010). *Direct Instruction Reading (Fifth Edition)* .
- Child, A. E., Cirino, P. T., Fletcher, J. M., Willcutt, E. G., & Fuchs, L. S. (2019). A Cognitive Dimensional Approach to Understanding shared and unique contributions to reading, Math, and Attention skills. *Journal of learning Disabilities* .
- Cotrell. (2017). *The Investigating of Critical Thinking*. Canada: SAGE.
- Cottrell, S. (2017). *Critical Thinking Skills (3rd ed) : Effective Analysis, Argument and Reflection*. Red Globe Press.
- Ennis, R. (1991). Critical thinking : A Streamlined Conception. *Teaching Philosophy* .
- Ennis, R. H. (1962). A Concept of Critical Thinking.
- Ennis, R. H. (1993). *Critical Thinking Assessment*. Routledge.
- Ennis, R. H. (2011). *The Nature of Critical Thinking: An Outline of Critical Thinking Dispositions*.
- Erdogan, F. (2019). Effect of Cooperative Learning Supported by Reflective Thinking Activities on Students' Critical Thinking Skills. *Eurasian journal of educational research* .
- Facione, P. A. (1990). Critical thinking : A statement of expert consensus for purposes of educational assessment and instruction. 12-19.

- Firdaus, Kailani, I., Bakar, M. N., & Bakry. (2015). Developing Critical Thinking Skills of Student in Mathematics Learning. *Journal of Education and Learning*, 9, 226-236.
- García-Madruga, J. A., Elosúa, M. R., Gil, L., Gómez-Veiga, I., Vila, J. Ó., Orjales, I., et al. (2013). Reading Comprehension and Working Memory's Executive Processes: An Intervention Study in Primary School Students. *Reading Research Quarterly* .
- Goertel, R. A. (2018). Critical thinking and reading. *English language teaching* .
- Grabe, W. (2009). *Reading in second language : Moving from theory to practice* .
- Grabe, William; Stoller, Fredricka L. (2019). *Teaching and researching reading : Third Edition*. Routledge.
- Halpern, D. F. (2012). *Halpern Critical Thinking Assessment : Test Manual*.
- Harmer, J. (2001). *The Practice of Language Teaching* (3 ed.). London: Longman Group
- Idol, L. (1987). A critical thinking map to improve content area comprehension of poor readers. *Remedial and special education*. doi:<https://doi.org/10.1177/074193258700800405>
- Kamali, Z., & Fahim, M. (2011, January). The Relationship between Critical Thinking Ability of Iranian EFL Learners and Their Resilience Level Facing Unfamiliar Vocabulary Items in Reading. *Journal of Language Teaching and Research*, 2, 104-111. doi:10.4304/jltr.2.1.104-111
- Karadeniz, A. (2015). An examination of critical reading self-efficacy perceptions.
- Khamkhong, S. (2018). Developing English L2 Critical Reading and Thnking Skills through the Pisa Reading Literacy Assesmen Framework : A Case Study of Thai EFL Learners. *3L: The Southeast Asian Journal of English Language Studies* .
- Klingner, J. K., Vaughn, S., & Boardman, A. (2007). *Teaching Reading Comprehension to Students with Learning Dofficulties* . New York : The Guildford Press .
- Liang, T. H. (2014). The Effects of Keyword Cues and 3R Strategy on Children's E-book Reading. *Journal of Computer Assisted Learning*, 176-187. doi:10.1111/jcal.12072
- Maiorana, V. P. (1992). *Critical thinking across the curriculum: Building the analytical classroom*. (W. Lewis, Ed.)
- McPeck, J. E. (2016). *Critical thinking and education*. St. Martin's Press.
- Mertes, L. M. (1991). Thinking and Writing . *Middle school journal* .
- Nilson, C., Fetherston, C., & McMurray, A. (2014). Developing Children's Critical Thinking through Creative Arts Exposure An Application of Ennis's Super-streamlined Critical Thinking Framework. *The International Journal of Arts Education* , 37.
- Norris, S. P., & Ennis, R. H. (1989). *Evaluating Critical Thinking*. Midwest.
- Oakhill, J., Cain, K., & Nesi, B. (2016). Understanding of Idiomatic Expressions in Context in Skilled and Less Skilled Comprehenders : Online Processing and Interpretation. *Scientific Studies of reading* .
- OECD. (2010). *PISA 2009 Results : What Students Know and Can Do*. OECD.
- OECD. (2018). *PISA 2015 : Results in Focus*. OECD.
- OECD. (2019). *PISA 2018 Assessment and Analytical Framework*. OECD.
- OECD. (2018). *PISA 2018 Draft Analytical Frameworks*. OECD.
- OECD. (2019). *PISA 2018 Released Field Trial and Main Surrvey New Reading Items*.
- OECD. (2003). *The PISA 2003 assessment framework: Mathematics, Reading, Science and problem solving knowledge and skills*. OECD.

-
- Oliveras, b., Marquez, C., & Sanmarti, N. (2011). The Use of Newspaper Articles as a Tool to Develop Critical Thinking in Science Classes. *International Journal of Science Education*. doi:1080/09500693.2011.586736
- Olson, V. A., & Ames, S. W. (1972). *Teaching and Researching Reading in Secondary School*. Atlanta : Georgia State University.
- Paul, R., & Elder, L. (2007). *Critical Thinking Competency Standarts*. Foundation for Critical Thinking Press.
- Perfetti, C. A., Landi, N., & Oakhill, J. (2005). *The Acquisition of Reading Comprehension Skill*. (M. J. Snowling, & C. Hulme, Eds.) Blackwell Publishing .
- Poce, A., Corcione, L., & Iovine, A. (2012). Content Analysis and Critical Thinking : An Assessment Study. 47-63.
- Puspita, I., Kaniawati, I., & Suwarma, I. R. (2017). Analysis of Critical Thinking Skills on the Topic of Static Fluid. *Journal of Physics*. doi:10.1088/1742-6596/895/1/012100
- Rayner, K., & Pollatsek, A. (1989). *The Psychology of Reading*.
- Rello, L., Saggion, H., & Yates, R. B. (2014). Keyword Highlighting Improves Comprehension for People with Dyslexia. 30-37.
- Rousseau, M. K., & Tam, B. K. (1991). The Efficacy of Previewing and Discussion of Key Word on the Oral Reading Proficiency of Bilingual Learners with Speech and Language Impairments. *Education and Treatment of Children*, 199-209.
- Rumelhart, D. (1977). *Toward an Interactive Model of Reading* (S Dornic ed.).
- S.Westwood, P. (2001). *Reading and learning difficulties : Aprpoaches to teaching and assessment* .
- Schleicher, A. (2018). *PISA 2018 : Insights and Interpretations* .
- Shihab, I. A. (2011). Reading as Critical Thinking. *Asian Social Science* .
- Snow, C. E. (2002). *Reading for Understanding : Toward an R&D program in Reading Comprehension*. RAND.
- Spiro, J. R., Bruce, C. B., & Brewer, F. W. (1980). *Theoretical Issues in Reading Comprehension* .
- Su, H. F., Ricci, F. A., & Mnatsakanian, M. (2016). Mathematical Teaching Strategies:Pathways to Critical Thinking and Metacognition. *International Journal of Research in Education and Science* , 2.
- Torgesen, J. K. (2000). Individual Differences in Response to Early Interventions in Reading: The Lingering Problem of Treatment Resisters. *Learning Disabilities Research & Practice* .
- Wade, C. (1995). *Using Writing to Develop and Assess Critical Thinking*. SAGE.
- Watson, S. M., Gable, R. A., Gear, S. B., & Hughes, K. C. (2012). Evidence-Based Strategies for Improving the Reading Comprehension of Secondary Students: Implications for Students with Learning Disabilities. *Learning Disabilities Research & Practice* .
- Yusuf, Q., Yusuf, Y. Q., Yusuf, B., & Nadya, A. (2017). Skimming and Scanning Techniques to Assist EFL Students in Understanding English Reading Texts. *Indonesian Research Journal in Education*. doi:https://doi.org/10.22437/irje.v1i1.4338