



## Jigsaw and Numbered-Heads Together in Teaching Reading Comprehension for Low and High Critical Thinking Students

Jarwanto Jarwanto✉, Suwandi Suwandi, Zulfa Sakhiyya

Universitas Negeri Semarang, Indonesia

### Article Info

#### Article History:

Accepted 09 May 2022

Approved 04 July 2022

Published 15

September 2022

#### Keywords:

Reading

Comprehension,

Jigsaw, Numbered-

HeadTogether, Critical

Thinking

### Abstract

This research aims to find out whether Jigsaw technique and N-H-T technique are effective in teaching reading comprehension to high and low critical thinking students. This research used experimental study that was conducted at SMAIT Bina Amal Semarang. The population of this research was the Tenth Graders of SMAIT Bina Amal Semarang. Two classes were selected as sample through a cluster random sampling. Each class was classified into two groups (the students having high and low critical thinking). The techniques to collect the data was multiple choice test to obtain the data of students with high and low critical thinking based on their reading comprehension result. The two instruments were tried out to obtain the valid and reliable items. The data was analysed by using multifactor analysis of ANOVA 2x2. Before conducting the ANOVA test, normality and homogeneity tests were conducted. Based on the findings, it can be concluded that there is no significant difference statistically between both techniques to students with high and low critical thinking in teaching reading due to the learning process at this school used both online and offline learning (students attended school five times in two weeks based on attendance number) also the allocation time of teaching learning was decreased during Covid-19 pandemic.

#### ✉Correspondence Address:

Pascasarjana UNNES Jl kelud Utara 3 Sampangan Semarang,

Indonesia,

E-mail: jarwantosyahida@gmail.com

**p-ISSN 2087-0108**

**e-ISSN 2502-4566**

## INTRODUCTION

Education and human development have been central to the Indonesian government's development agenda (World Bank, 2020). Education has been significantly improved over the past two decades to achieve this goal. Education reforms and increased spending on education since the early 2000s have helped to improve access to education, especially for disadvantaged children (World Bank, 2018b). The number of enrollments in primary and secondary education has increased to 31 percent since 2002, which accounted for more than 10 million students. Indonesia has also made great strides in addressing gender parity in education. In 1975, 65 percent of students were men, while today, the number of male and female students is roughly the same. Despite these significant achievements, Indonesian students are yet able to reach their full potential, particularly in essential skills such as reading and writing, with only 30 percent of children passing the reading scores. The result means that the critical thinking ability of Indonesian students is still low.

Furthermore, the performance of Indonesian students in PISA 2018 showed that Indonesian students ranked 74th out of 80 countries, or 6th from the bottom in the literacy category. PISA 2018 gave Indonesia an average score is 371, which was below Panama (Schleicher, 2018).

Unlocking Indonesian students' full potential is crucial to the nation's future success. One of the biggest challenges is that Indonesian children do not study enough, despite Indonesian pupils going to school for an average of 12.4 years, they only learn for approximately 7.8 years worth of learning (Human Capital Index 2020). Leigh (1999) added that schooling does not guarantee the learning process, which means that higher order of thinking and critical thinking was rarely stimulated.

Critical thinking is one of the most discussed skills in this era. In a study by the Educational Testing Service (Liu, Frankel & Roohr, 2014) in which more than 200 institutional Provost investigated the most

frequently measured general education skills, the investigation found that critical thinking is one of the most routinely cited skills. Moreover, professional success was considered essential to both. Critical thinking is one of the skills students need in the 21st century (Willingham, 2010). In addition, Soffel (2016) revealed through the 2015 edition of the World Economic Forum's Report on the Future of Work that critical thinking was ranked fourth of the ten skills 21st-century students receive. Critical thinking skill is projected to rise to number one in 2020. Casner and Barrington (2006) identified 92.1% of the 400 employers surveyed where critical thinking is regarded as a vital skill for four-year college graduates to teach and acquire to succeed in today's workforce. Therefore, it turns out that critical thinking is an essential skill that students must learn and master.

Critical thinking is a cognitive activity associated with the use of the mind. Learning to think and evaluate critically and analytically means using mental processes such as attention, classification, choice, and judgment. Therefore, critical thinking is the scientific process of making informed decisions that focus on what to believe and do. The word "reasonable" means that reasoning arises through a logical thinking process, and "judgment" is the determination of how much something meets a standard, rule, or other criteria (Ennis, 1985; Beyer, 1995; Facione, 2000; Stapleton, 2001). Reasonable judgment includes the process of logical thinking, decision-making, and problem-solving (Halpern, 2003; Butler, 2012).

Glaser (1942), a Psychologist, defines critical thinking as an attitude and logic-application skill in problem-solving. Ennis (1962) logically defines the configuration as a process-oriented and product-oriented phenomenon, which characterizes it as a correct rating of a statement. Current conceptualization suggests that critical thinking requires Goal Oriented Reflection Process Logic (Brookfield, 1987; Ennis, 1989). From the mid-90s to the present, researchers have argued that critical thinking relies on the predisposition and deliberate remorse (Ennis, 1993; Facione, 2011; Paul,

1997). However, researchers as early as Glazer suggest that disposition is integral to this structure. Experts discuss whether they can learn critical thinking or whether it is a developmental process regulated by motivation, propensity, and personality traits. Despite the difference in opinion, the modern researcher agrees that critical thinking is “purposeful, interpretation, analysis, evaluation, self-adjusting judgment leading to conclusions,” And the methodological, standard, or contextual considerations underlying the explanation, concept, and evaluation of evidence” (Facione, 1990., p.2). The writer concludes that critical thinking is the ability of education to correctly assess reason, weigh the relevance of evidence, and identify false arguments to achieve the primary learning goals. In other words, critical thinking encourages students to think positively and dexterously.

There will be doubts in the process of thinking. When students have doubts as consequences of the thinking process, they will consider how to make a decision and solve the problem. English is one of the lessons learned in school that significantly promotes creativity, innovation, and critical thinking in students. However, the minds of the millions of young people who attended school were inevitably shut in (by the young people themselves), and energy was directed towards acquiring capital, with "academic degrees" seen as a precious commodity (Bourdieu, 1996). In addressing this problem, Leigh (1999) added that community foundation is the main task of the continuing education system. However, the individual citizen's role in Indonesia is limited by a curriculum that requires an open and unconditional acceptance. Research on critical thinking skills, such as Alwasilah (2008), found that 83% of Indonesian primary and secondary school students think less critically, while at the college level, the figure was 71%. The lack of critical thinking in Indonesian students has three causes, which are: Indonesian cultural influence (71%), inexperienced teachers and lecturers in critical thinking learning (71%), and low-skilled teachers and colleagues (25%). According to the

research, we can conclude that students' poor critical thinking ability is because teachers rarely develop it, creating a poor critical thinking habit. Lack of development happened despite the argument that teachers play a significant role in developing students' critical thinking skills (Warouw and Friends, 2012). It is because the teacher is poorly qualified to motivate students to engage in critical thinking. Therefore, we need to extract some key points from English to create a critical mindset so that the result is not only innovation but also innovative thinking and a positive impact on students in their development phase.

Reading is one of the most important skills in a language. It plays an essential role in our life. Through reading, we can explore the world that we have never visited before and the great ideas of people in the past. All of which will enrich our experience and knowledge and broaden our horizons. In Indonesia, students find it difficult to understand English texts in magazines, newspapers, and their school books. They are still confused to answer comprehension questions when reading texts. There are many possible reasons, one being the teacher's inability to teach the students. The teaching and learning environment is monotonous; the teacher does not use other strategies and materials in the reading class to motivate students learning ability to read. The teacher teaches students using techniques or methods that are too complex for students to understand, which leads to boredom and makes them lose their attention while studying.

Based on the language assessment theory of Brown (2003), especially for reading, there are some criteria commonly used in measuring students' reading comprehension ability, there are: (1). Main idea (topic), (2). Expressions/idiom/phrases in context, (3) Inference (implied detail), (4). Grammatical features (reference), (5). Detail (scanning for a specifically stated detail), (6). Excluding facts not written (unstated details), (7) Supporting idea(s), and (8) Vocabulary in context.

Based on those statements, the writer concludes that students reading comprehension is the process of getting the message from the

author's written text in the form of an idea, a fact, a feeling, an argument, or other messages. Meanwhile, the criteria commonly used to measure reading comprehension are grammatical features, expressions/idiom/phrases in context, supporting the idea, detail, main idea, inference, excluding fact not written, and vocabulary in context.

An assessment should be done to know the students' progress in reading comprehension. It also needed significant objectives of education (Rohmatul et al. 2020; Amali, L et.al. 2022). According to Brown (2004: 4), assessment is the measurement process done by the teacher whenever students practice language skills. It is divided into two types: The first is a formal assessment that the teacher does without designing the assessment. The form of this assessment is incidental, unplanned comments or responses into impromptu feedback to the students like "good job," "excellent," or "well-done." It can be done by giving feedback on the students' papers and correcting students' pronunciation. The second type is a formal assessment in the form of exercises that the teacher should prepare to assess the students' competence, such as quizzes, assignments, and examinations.

In addition, Alderson (2000, pp. 206-232) states that the teacher can use seven types of reading assessments. One of them is multiple choice which provided choices for students in answering the questions. This multiple-choice evaluation format aims to see the test taker's cautious when concluding. In addition, this format allows candidates to make logical inferences when deciding on an answer. Candidates may have different beliefs and opinions, and the reasons can be seen by the test taker (Brown, 2004; Ennis R. H., 2003; Abdalla, 2011; Luo, 2011; Kastner & Stangl, 2011; Javid, 2014; Kılıçkaya, 2016; Tangianu, 2018). Therefore, reading assessments (multiple choice in this case) can be used to measure the students' competence, and the teacher can choose more than one reading assessment to check students' competence.

Therefore, the teacher must consider an adequate strategy to awaken the interest and motivation of the students to learn reading comprehension and quickly master the material explained by the teacher. Cooperative learning is also known as small group learning. Lie (2008, p.18) backs it up by stating that cooperative learning allows students to work in small groups. Cooperative learning is similar to small group learning, but it is more than that. Cooperative learning, according to Olsen and Kagan (1992), is an organized learning activity in which the process is dependent on the socially structured exchange of information among students in groups. Meng (2010) studied collaborative learning through a jigsaw that students in the experimental class benefited from the collaborative learning approach. It also stimulates students' interest in studying English, stimulates their motivation, and improves their reading comprehension. In addition, puzzle co-learning embodies learner-centric, teacher-supported, positive, interdependent communication. Therefore, it is no exaggeration to say that the collaborative puzzle learning approach is an effective way to teach English reading.

In other cooperative learning, Numbered-Heads Together (NHT) technique is a solution to solve students' passivity and difficulty in understanding the text. Himmele & Himmele (2011) showed that the Numbered-Heads Together technique would likely facilitate student participation and cognitive involvement. That means that after increasing opportunities, many students are likely to participate in the process of learning English and promote cognitive participation.

Therefore, the researchers aim to describe the process of using Jigsaw and Numbered-Heads Together (NHT) in the reading class and discover more direct evidence from teachers and students. This study will help English teacher to formulate different questions by combining easy, intermediate, and challenging questions (basic understanding, critical thinking, and creative thinking). Thus, it will help the students get used to dealing with different types of questions and

help them to think rationally and critically to find an answer to the question on the kind of reading comprehension and rational thinking based on the students' level of thinking.

## METHODS

In this research, the researchers applied an experimental pre-test post-test design. The researcher used pre-test and post-test; in experimental design, the researcher chose two classes as experimental classes. The experiment is conducted to explore the strength of the relationship between variables. Thus, in this case, there were 3 (three) variables involved, independent variable, dependent variable, and moderator variable. The independent variables were Jigsaw Technique and Numbered-Heads Together (NHT); the dependent variable was reading comprehension and critical thinking as the moderator variable.

Further, this research applied a 2x2 factorial design with a statistical analysis ANOVA (Analysis of Variance). The factorial design was defined as a modification of an actual experimental design, with the further complication (usually moderator variables) included in addition to the treatment variables (Tuckman, 1978; Fujikoshi, 1993; Gelman, 2005; Gelman & Hill, 2006; Casella, 2008). In this study, a two-way ANOVA was used to compare group which differs from one another along two dimension factors. It enables the researcher to identify causal relationships since it allows the researcher to observe the effect of systematic and hanging one or more variables under control conditions. In this research, the researcher used an interview and a test to get the data. The interview was used to get the data from the English teacher, and the test was used to get the data on the students' reading skills.

## RESULTS AND DISCUSSIONS

The research aims to determine the effectiveness of the Jigsaw technique to improve the student competence in reading techniques for students with high critical and low critical thinking. In order to make the measurement more straightforward, the Jigsaw technique is compared with another technique usually used by the teacher in teaching reading comprehension. So Numbered-Heads Together (NHT) technique was chosen as the comparative technique.

Before the treatment was applied, the researcher divided the class into two groups, students with high critical thinking and students with low critical thinking. The researcher then delivered a pretest to determine where the students should be categorized. The pretest contained several questions about the students' learning habits and their views about English teaching-learning. After the students answered the pretest, the researcher calculated the data using the normality and homogeneity tests. After finding that all data was distributed normally, the researcher measured data homogeneity. Because all data were normally distributed and homogeneous, the instruments were appropriate for the students.

### **Jigsaw and Numbered-Heads Together (NHT) Technique in teaching Reading Comprehension for High Critical Thinking Students**

The value of Jigsaw Sig. is  $0,075 > 0,05$ . So, it can be concluded that  $H_0$  is accepted and  $H_a$  is rejected. It means that the Jigsaw technique effectively teaches reading comprehension to students with high critical thinking. Furthermore, for NHT the value of Sig.  $0,408 > 0,05$ . So, it can be concluded that  $H_0$  is accepted and  $H_a$  is rejected. It means that the Numbered-Head-Together technique effectively teaches reading comprehension to students with high critical thinking.

**Table 1.** Jigsaw in Experimental Class

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	410,833	7	58.690	3.181	0.075
Within Groups	129,167	7	18.452		
Total	540,000	14			

**Table 2.** Numbered-HeadTogether (NHT) in Experimental Class

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	110,000	3	36.667	1.052	0.408
Within Groups	383,333	11	34.848		
Total	493,333	14			

### Jigsaw Technique in teaching Reading Comprehension for Low Critical Thinking Students

From the data measurement, it is found that the value of Sig. 0,120 > 0,05. So, it can be concluded that Ho is accepted and Ha is rejected. It means that the Jigsaw technique effectively

teaches reading comprehension to students with low critical thinking. In addition, the NHT value of Sig. 0,782 > 0,05. So, it can be concluded that Ho is accepted and Ha is rejected. It means that the Numbered-Head-Together technique effectively teaches reading comprehension to students with low critical thinking.

**Table 3.** Jigsaw in Control Class

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	306,667	6	51.111	2.453	0.120
Within Groups	166,667	8	20,833		
Total	473,333	14			

**Table 4.** Numbered-HeadTogether (NHT) in Control Class

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	51,458	3	17,153	0.362	0.782
Within Groups	521,875	11	47,443		
Total	573,333	14			

### Difference of Effectiveness Between Jigsaw Technique and NHT Technique in Teaching Reading Comprehension to High and Low Critical Thinking Students

The result shows an interaction between the teaching technique (Jigsaw and NHT) and reading comprehension. The result means that the teaching technique's effect on the students' reading skills depends on the students' critical thinking. Based on the findings, it can be concluded that there is no significant difference statistically between both techniques for students with high and low critical thinking in teaching reading.

Finally, based on all the explanations proven by the data gained in the research and the statistical calculation, the researcher demonstrates that Jigsaw and NHT techniques improve the student's competence in reading comprehension, both for students with high critical thinking and students with low critical thinking. Covey (2008) said that the Jigsaw technique help students realize that they are essential components of a whole and encourages cooperation in a learning environment. It would make them more active in learning the material. In addition, some previous studies explained that the NHT technique is appropriate for improving reading comprehension.

**Table 5.** Paired Samples Test of High Critical Thinking Students

		Paired Differences					T	Df	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Jigsaw – Posttest NHT	-1.667	7.715	1.992	-5.939	2.606	-0.837	14	0.417

**Table 6.** Paired Samples Test of Low Critical Thinking Students

		Paired Differences					T	Df	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Jigsaw – Posttest NHT	2.000	5.916	1,528	-1.276	5.276	1.309	14	0.212

Based on Table 5, there is no significant difference statistically between Jigsaw and Numbered-Heads Together for teaching reading comprehension to high critical thinking students. Moreover, Table 6 shows there is no significant difference statistically between Jigsaw and Numbered-Head-Together for teaching reading comprehension to low critical thinking students.

The researchers analysed that two factors of the problem of researchers' during the research were the learning process at this school uses both online and offline learning during the Covid-19 pandemic (students attend school five times in two weeks based on attendance number) also the allocation time of teaching learning was decreased 50% during the Covid-19 pandemic.

## CONCLUSIONS

This study concerns the effectiveness of two collaborative techniques (Jigsaw and Numbered-Heads Together) in teaching reading comprehension. The research findings (data analysis and hypothesis testing) concluded that the Jigsaw technique and Numbered-Heads

Together effectively teach reading comprehension to the tenth graders' low and high critical thinking. Based on the students' pre-test and post-test results, their scores significantly differed before and after the teaching technique applied in reading comprehension. The use of techniques is also effective in teaching reading comprehension for tenth graders with low and high critical thinking. The research findings give teachers evidence and input about the importance of reading strategies in teaching reading text types. Teachers are expected to be ready to assist in learning whatever they need to see favorable and appropriate teaching methods related to learning circumstances in the classroom.

Based on the result and findings, the researcher provides some suggestions to whom it may concern to improve the students' reading comprehension. It is hoped that English teacher can adapt and adopt the reading procedures in Jigsaw and Numbered-Heads Together techniques as additional references for improving the students' reading comprehension. In this case, the teacher needs to have an excellent awareness of the students' characteristics so that the teacher

can provide additional assistance in the reading procedure to help students gain more reading comprehension through Jigsaw and Numbered-Heads Together. For students, they are suggested to follow the teacher's reading instructions carefully. Therefore, when the students have difficulties during the reading process, they should actively clarify or confirm to the teachers to improve their reading comprehension. The potency of Jigsaw and Numbered-Heads Together to enhance the students' reading comprehension can be very precious for other researchers to investigate the effectiveness of Jigsaw and Numbered-Heads Together in teaching reading comprehension. Therefore, the result of this research can be used as a reference for researchers to investigate further.

## REFERENCES

- Abdalla, M. G. (2011). *Constructing A-Type Multiple Choice Questions (MCQs): Step by Step Manual*.
- Alderson, J.C.(2000). *Assessing Reading*, Cambridge: C.U.P.
- Amali, L., Anggani Linggar Bharati, D., & Rozi, F. (2022). The Implementation of high order thinking skills (HOTS) assessment to evaluate the students' reading comprehension achievement. *English Education Journal*, 12(1), 10-18.
- Alwasilah, A.C. (2008). *Filsafat Bahasa dan Pendidikan*. Bandung: Remaja Rosdakarya.
- Beyer, B. K. (1995). *Critical thinking*. Bloomington, IN: Phi Kappa Delta Educational Foundation.
- Bourdieu, P. (1971). *Systems of Education and Systems of Thought*. In *Knowledge and Control: New Directions for the Sociology of Education*, edited by Michael Young. London: Collier-Macmillan
- Brookfield, S. (1987). *Developing critical thinking: Challenging adults to explore alternative ways of thinking and acting*. San Francisco: Jossey – Bass.
- Brown, H Douglass. (2003). *Language Assessment Principle and Classroom Practices*. San Fransico, California
- Brown, H Douglass. (2004). *Teaching by Principles an Interactive Approach to Language Pedagogy*. Longman.
- Brown, H. Douglas (2004). *Language assessment: Principles and classroom practices*. White Plains, NY: Pearson Education
- Butler, H. A. (2012). *Halpern Critical Thinking Assessment Predicts Real-World Outcomes of Critical Thinking*. Wiley Online Library, 26(5), 721-729.
- Casner-Lotto, J., & Barrington, L. (2006). *Are They Really Ready to Work? Employers' Perspectives on The Basic Knowledge and Applied Skills of New Entrants to The 21st Century*. U.S. Workforce. Partnership for 21st Century Skills.
- Casella, G. (2008). *Statistical design*. Springer Texts in Statistics. Springer.
- Ennis, R. H. (1993). Teaching for higher order thinking. *Theory into Practice*, 32 (3), 181
- Ennis, R. H. (1962). A concept of critical thinking: A proposed basis for research in the teaching and evaluation of critical thinking ability. *Harvard Educational Review*, 32, 81–111
- Ennis, R. H. (1989). *Critical Thinking and Subject Specificity: Clarification and Needed Research*. *Educational Researcher*, 18(3), 4–10.
- Facione, P. A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction—The Delphi report. Millbrae, CA: California Academic Press.
- Facione, P. A., Facione, N.C., Giancarlo, C.A. (1997) Setting expectations for student learning. *New directions for higher education*. Millbrae: California Academic Press.
- Facione, P. A. (2011). *Think Critically*, Pearson Education: Englewood Cliffs, NJ.
- Facione, P. A. (2000). The disposition toward critical thinking: Its character, measurement, and relationship to critical thinking skill. *Informal Logic*, 20(1), 61-84.

- Fujikoshi, Y. (1993). "Two-way ANOVA models with unbalanced data". *Discrete Mathematics*. **116** (1): 315–334.
- Gelman, A. (2005). "Analysis of variance? why it is more important than ever". *The Annals of Statistics*. **33** (1): 1–53.
- Gelman, A., Hill, J. (2006). *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge University Press. pp. 45–46.
- Glaser, E. M. (1942). An experiment in the development of critical thinking. *Teachers College Record*, **43** (5), 409-410. Retrieved from <http://www.tcrecord.org>.
- Halpern, D. F. (2003). *Thought and knowledge: An introduction to critical thinking*. Erlbaum.
- Himmele, P. & Himmele, W. (2011) in Martriwati & Firdaus (2014). *Total Participation Techniques: Making Every Student an Active Learner*. Alexandria, USA: ASCD product.
- Javid, L. (2014). The Comparison between multiple-choice (MC) and multiple true/false (MTF) test formats in Iranian intermediate EFL learners' vocabulary Learning. *Procedia - Social and Behavioral Sciences*. **98**, 784-788.
- Kastner, M., & Stangl, B. (2011). Multiple choice and constructed response tests: do test format and scoring matter? *Procedia Social and Behavioral Sciences*, **12**, 263-273.
- Kılıçkaya, F. (2016). Grade Cam GO!: Grading multiple-choice tests instantly. *The AATSEEL Newsletter*, 8-10.
- Leigh, B. (1999) *Learning and Knowing Boundaries: Schooling in New Order Indonesia*. Institute of Southeast Asian Studies (ISEAS).
- Liu, O. L, Frankel, L., & Roohr, K. C. (2014). Assessing critical thinking in higher education: current state and directions for next-generation assessment: Assessing critical thinking in higher education. *ETS Research Report Series*, (1), 1 – 23.
- Mason, M. (2008). *Critical Thinking and Learning*. Singapore: Fabulous Printers
- Luo, S. Z. (2011). Multiple-choice item and its backwash effect on language teaching in China. *Theory and Practice in Language Studies*, **1**(4), 423-425.
- Paul, R. W., & Binker, A. J. A. (1990). *Strategies: Thirty-five dimensions of critical thinking*. In A. J. A. Binker (Ed.), *Critical thinking: What every person needs to survive in a rapidly changing world* (pp. 305–349). Rohnert Park, CA: Centre for Critical Thinking and Moral Critique, Sonoma State University.
- Rohmatul, S. M., Bharati, D. A. L., & Rozi F. (2020). The implementation of Authentic assessment to assess students' higher order thinking skills in writing at MAN 2 Tulungagung. *English Education Journal*, **10**(3), 374-386.
- Schleicher, A. (2018). PISA 2018 Insights and Interpretations.
- Soffel, J. (2016). What are the 21-st-century skills every student needs? World Economic Forum.
- Stapleton, P. (2001). *Assessing Critical Thinking in the Writing of Japanese University Students*. SAGE Publications, **18**(4), 506 – 548.
- Tangianu, F. M. (2018). Are multiple-choice questions a good tool for the assessment of clinical competence in internal medicine?. *Italian Journal of Medicine*, **12**(2), 88-96.
- Tuckman, B. C. (1978). *Conducting Educational Research*. New York: Harcourt Brace Jovanovich.
- Warouw, Z. W. M., Raturandang, J. O., Sumakul, J. (2012). *Persepsi Guru Biologi terhadap Pembelajaran Yang Memberdayakan Kemampuan Berpikir Kritis dan Hasil Belajar Siswa di SMP Negeri dan Swasta Tondano*. Dalam *Jurnal.fkip.uns.ac.id*.
- Willingham, D. T. (2010). *Critical Thinking: Why is it so hard to teach?* *Arts Education Policy Review*, **109**(4), 21 – 32.
- World Bank. (2018b). *World Development Report 2018: Learning to Realize Education's Promise*. World Bank, Washington, DC.
- World Bank. (2020). *The promise of education in Indonesia*.