

Developing an Instrument to Assess EFL Learners' Critical Thinking Skills in Writing Expository Problem-Solution Essays

Jumariati¹, Eka Puteri Elyani², Nawal³ & Suci Arthyara Larasati⁴

Universitas Lambung Mangkurat
Banjarmasin, Indonesia

Citation: Jumariati, Eka Puteri Elyani, Nawal & Suci Arthyara Larasati (2022) Developing an Instrument to Assess EFL Learners' Critical Thinking Skills in Writing Expository Problem-Solution Essays, *International Journal of English Language Teaching*, Vol.10, No.5, pp.,30-37

ABSTRACT: *Learning activities that utilize a problem-solving approach are an effort to train students' critical thinking skills. However, to determine the success of learning that develops students' critical thinking skills, teachers should be able to measure the skills using the right instrument. This study is aimed to develop an assessment instrument to measure EFL learners' critical thinking skills in writing expository problem-solution essays. The participants of the study were advanced students of Academic Writing who participated in the pilot study small and large scales. The analysis found that the scores yielded by the two raters were valid and reliable (r value obtained was .987 and a value for each component was higher than r table .320). Furthermore, the score on each component of assessment namely the depth of analysis was .640, the feasibility of solution was .667, the logic of argument was .795 and the use of evidence was .908. These scores are greater than the R table which means that the scores are valid. This suggests that the test instrument and the scoring rubric can be used in assessing EFL students' critical thinking skills particularly on the ability to analyze an issue, propose suitable solution, provide logic argument, and use of relevant evidence.*

KEYWORDS: critical thinking skills, writing, expository essay, problem-solution

INTRODUCTION

Having critical thinking skills in the context of learning English as a Foreign Language (EFL) is important (Beaumont, 2010; Fahim & Sa'ee pour, 2011; Nejmaoui, 2019). These skills can be trained and developed during the learning process, for example through problem-based learning activities, collaboration-based learning, discussion, reading and writing ((Alsaleh, 2020; Jumariati et al., 2021) and through cooperative learning (Rimiene, 2002). Students are involved in presentation activities, debates, making posters, and writing expository and argumentative essays based on factual problems as the issues that need to be solved. Through this activity, students learn how to explore a problem, analyze every aspect of the problem, find alternative solutions to problems, realize the consequences of each alternative solution, and propose the most appropriate solution according to their point of view.

However, the success of learning is determined in part by an effective assessment that is based on assessment principles (Pantiwati, 2013) since assessment can give

meaningful information for the teachers and students dealing with learning progress (Khazrouni, 2019). In other words, to determine whether English language learning has succeeded in developing students' critical thinking skills, an assessment to measure students' critical thinking skills is necessary. As explained by (Lai & Viering, 2012), critical thinking skills are reflected in a person's ability to analyze cause and effect, propose the best solutions and put forward arguments. Critical thinking skills are also closely related to metacognitive abilities, problem solving skills and the ability to understand literature (Heard et al., 2020; Paul & Elder, 2007). Hence, it is necessary to consider these components in designing an instrument to assess critical thinking skills.

Assessment of critical thinking skills will provide more comprehensive results if students are asked to produce their own thoughts in the form of oral or written descriptions compared to choosing answers to multiple choice questions (Fisher, 2001; Huffman et al., 2000). Additionally, using performance based assessment as a tool to measure critical thinking skill is appropriate since it requires test takers to utilize their own cognitive skills in analyzing problems as the evidence of their skills in thinking critically (Saxton et al., 2012). Based on this, it is important to conduct a development research to produce an instrument to assess students' critical thinking skills in writing expository essays. This study is aimed to develop an assessment instrument to measure EFL learners' critical thinking skills in writing expository problem-solution essays.

LITERATURE REVIEW

There are some definitions to clarify the term critical thinking skills. (Fisher, 2001) defines critical thinking skills as the ability to provide logical reasons against a condition and the ability to evaluate those arguments. This means that to be able to think critically, a person must be able to assess and criticize arguments for the views or beliefs they have on a matter. Therefore, critical thinking ability is the ability to understand an information/problem, recognize the relationship between elements, assess the credibility of information, and identify important components in drawing logical conclusions deductively or inductively (Facione, 2020).

Critical thinking skills are often associated with higher order thinking skills (HOTS). This is because many components of higher order thinking skills are needed if someone is required to think critically (Huffman et al., 2000). Specifically, critical thinking skills are closely related to the top three skills in the HOTS version of Bloom's Taxonomy, namely synthesis, analysis, and evaluation. Thus, if students are trained to hone higher order thinking skills such as synthesis, analysis and evaluation, in the end these skills will hone their ability to think critically. That is why, critical thinking is defined as a person's thinking process in analyzing and evaluating information and generating arguments correctly so that it can provide better information by describing the results of observations, experiences, and communication (Paul & Elder, 2002).

Stated in the Framework for Assessment of Critical Thinking Ability by the Australian Education Research Council (ACER), critical thinking skills include the ability to

analyze and evaluate information and justify an argument which implies that someone who thinks critically is able to put forward an argument supported by strong reasons and accurately predict the consequences of the arguments taken (Heard et al., 2020). Furthermore, it is stated that the indicators of critical thinking ability are categorized into several levels ranging from (1) building knowledge through identifying information gaps, distinguishing information, and identifying patterns and connecting them, (2) evaluating reasons/arguments by using logic, identifying assumptions, and justifying arguments, and (3) making decisions through identifying criteria for making decisions, evaluating decision alternatives, as well as testing and monitoring the implementation of decisions.

Learning activities that utilize a problem-solving approach are an effort to train students' critical thinking skills. However, to determine the success of learning that develops students' critical thinking skills, teachers must be able to measure using the right instrument. This is to ensure that the learning model applied has succeeded in developing students' critical thinking skills (Stein et al., 2003) and achieving educational goals holistically (Rimiene, 2002).

RESEARCH METHOD

This study was an educational research and development that attempts to develop an instrument to assess EFL students' critical thinking skills in writing expository problem-solution essays. The procedures consisted of need analysis, designing the first draft of the instrument, validating the first draft, revising the first draft, piloting, and revising and producing the final product (Gall et al., 2005).

The instrument used in this research was validation sheets on the draft of the instrument that was writing test and the analytical scoring rubric. The writing test (writing prompt) instructed the students to write an expository problem-solution essay by choosing one of the wetlands topics provided. Meanwhile, the scoring rubric was an analytical scoring rubric which measured students' critical thinking skills in the components of the depth of analysis, the suitability of the solutions, the logic of arguments, and the use of facts/evidence.

RESEARCH FINDINGS

In the first phase, the researchers examined problems in the field through discussions with the lecturers of the Academic Writing course of the English Education Study Program of FKIP University of Lambung Mangkurat. It was found that students' critical thinking skills need to be trained and measured. However, there are no validated tests and assessment rubrics to measure students' critical thinking skills, especially in Advanced Writing and Academic Writing courses that allow students to practice critical thinking through writing problem-solution expository essays. Hence, it is necessary to develop a validated instrument to measure students' critical thinking skills, especially in solving problems, in the form of writing problem-solution expository essays. Furthermore, the researchers collected information through literature review related to

critical thinking skills in the field of language, especially in writing skills. It was found that there were some indicators of critical thinking in expository writing which comprised of the depth of the causal analysis, the suitability of the solutions proposed, the quality of the arguments proposed, and the use of evidence/facts.

The next phase, the initial prototype of test instrument and the scoring rubric were developed by determining the indicators found from reviewing literature. These drafts were then examined by two experts of language assessment and the teaching of EFL writing. Some revisions were made regarding the efficiency of the instruction/writing prompt and the scoring rubric especially the criteria of argument in the scale of 1. Then, the revised initial drafts were tried out in a small scale by involving ten students of the study program. The students' writings were then scored by two raters and analyzed by using SPSS version 28.0. The analysis showed that the reliability coefficient was .972 which was categorized as high reliability. This is to say that the scores from the raters were highly reliable. Table 1 displays the result of the analysis on the students' essays in the first tryout.

Table 1. Reliability Result on the First Piloting

Reliability Statistics		
Cronbach's Alpha Based on		
Cronbach's Alpha	Standardized Items	N of Items
.972	.974	2

The next phase was conducting a tryout by involving larger number of students. There were 40 students involved in the second piloting. The students' essays were then rated by the two raters and analyzed by using SPSS version 28.0. The data revealed that the reliability coefficient found was .987 which was categorized as very high reliability. Again, this coefficient showed that the scores from the two raters were highly reliable.

Table 2. Reliability Result on the Second Piloting

Reliability Statistics		
Cronbach's Alpha Based on		
Cronbach's Alpha	Standardized Items	N of Items
.987	.990	2

Subsequent to analyzing the reliability, the scores were analyzed to find the validity. This process was carried out by using SPSS with Pearson Product Moment formula.

The analysis was conducted by calculating the scores in each component of the measurement: the depth of causal analysis, the suitability of the solutions, the logic of the arguments, and the use of evidence. The results showed that the scores in each component were valid as displayed in the Table 3.

Table 3. Results of Validity Analysis

		Correlations				
		ANALYSI S	SOLUTIO N	ARGUME NT	EVIDENC E	TOTAL
ANALYSIS	Pearson Correlation	1	.261	.332*	.431**	.640**
	Sig. (2-tailed)		.104	.036	.006	<.001
	N	40	40	40	40	40
SOLUTION	Pearson Correlation	.261	1	.390*	.526**	.667**
	Sig. (2-tailed)	.104		.013	<.001	<.001
	N	40	40	40	40	40
ARGUMENT	Pearson Correlation	.332*	.390*	1	.651**	.795**
	Sig. (2-tailed)	.036	.013		<.001	<.001
	N	40	40	40	40	40
EVIDENCE	Pearson Correlation	.431**	.526**	.651**	1	.908**
	Sig. (2-tailed)	.006	<.001	<.001		<.001
	N	40	40	40	40	40
TOTAL	Pearson Correlation	.640**	.667**	.795**	.908**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	40	40	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Based on the data in Table 3, the correlation coefficient for the depth of causal analysis was .640 while for the suitability of the solutions was .667. Meanwhile, the correlation coefficient for the logic of the arguments was .795 and the use of evidence was .908. These values were then compared with the R table for 38 students (N-2) at the .005 significance level. Each of the coefficient was greater than the R table which meant that the scores were valid. Hence, it is concluded that the scores generated for each component of critical thinking skills measured are valid.

DISCUSSION

The results of experts' validation indicated that the test instrument was appropriate because it contained the basic components of critical thinking skills, namely the ability

to analyze the causes of problems in the form of evaluating and criticizing, the ability to propose appropriate solutions, the ability to argue using logical and credible facts, and the ability to use relevant sources of evidence through citing and referencing. This is in line with the theory states that critical thinking skills include the ability to analyze problems, elaborate on a condition, propose several solutions, provide logical arguments and credible evidence (Alsaleh, 2020; Heard et al., 2020; Lai & Viering, 2012).

In addition, the essay writing test is a form of performance test that is considered appropriate by instrument validation experts because it requires students' ability to analyze problems and provide solutions along with logical arguments. This is in line with the theory that the performance test is the most appropriate form of test in measuring critical thinking skills because it test takers to independently demonstrate their cognitive abilities, namely their ability to think critically (Saxton et al., 2012).

Based on the results of small-scale and large-scale trials, the test instruments and assessment rubrics were able to produce consistent scores between the two raters. This proves that the test instrument for writing an expository essay problem-solution along with the rubric for assessing critical thinking skills in solving problems that have been developed in this study can produce valid and consistent data. In a subjective writing test, involving two raters as assessors can minimize subjectivity (Alduais, 2013; Saxton et al., 2012). Moreover, training to scoring helped the raters to gain similar perceptions and understanding on how to assess students' essays using the score and criteria provided.

Meanwhile, the level of practicality according to experts is appropriate both from the side of the test maker and the test taker. Specifically, Expert A considered that this instrument was practical in terms of preparation because it did not require many questions which could take a long time to make. Meanwhile, Expert B said that using real issues in the surrounding environment made this test instrument practical both in preparation and execution, especially because references related to factual issues were easy to find. The practicality of the instrument is crucial related to the implementation of the test (Crusan, 2010) and is determined by several things such as human resources (test compilers, implementers and assessors), materials (test materials, equipment, and test venues), the time of preparation and implementation of the test, and the costs to develop, implement and assess (Drid, 2018).

CONCLUSIONS AND IMPLICATIONS

Referring to the findings, it is concluded that the test instrument together with the scoring rubric can be considered as a valid and reliable measure of critical thinking skills particularly in the depth of analysis, suitability of the solutions, logic argument and valid evidence. However, the limitation of the subjects involved in the pilot study suggests further investigation on larger scale of subjects with other factual issues to be

utilized as the stimulus in analyzing cause-effects, proposing viable solutions, and giving logic arguments.

REFERENCES

- Alduais, A. M. S. (2013). *Language Testing: An Introductory Course to Design Tests to Language Components and Skills with Exercises, Assignments, and a Final Test*. Lambert Academic Publishing.
- Alsaleh, N. J. (2020). Teaching Critical Thinking Skills: Literature Review. *The Turkish Online Journal of Educational Technology*, 19(1), 21–39.
- Beaumont, J. (2010). A Sequence of Critical Thinking Task. *TESOL Journal*, 1(4), 1–22.
- Crusan, D. (2010). *Assessment in the Second Language Writing Classroom*. University of Michigan.
- Drid, T. (2018). The Fundamentals of Assessing EFL Writing. *Psychological and Educational Studies*, 11(1), 292–305.
- Facione, P. A. (2020). *Critical Thinking: What It is and Why It Counts*. Measured Reasons LLC.
- Fahim, M., & Sa'eepour, M. (2011). The Impact of teaching Critical Thinking Skills on Reading Comprehension of Iranian EFL Learners. *Journal of Language Teaching and Research*, 2(4), 867–874.
- Fisher, A. (2001). *Critical Thinking: An Introduction*. Cambridge University Press.
- Gall, J. P., Gall, M. D., & Borg, W. R. (2005). *Applying Educational Research: A Practical Guide* (5th ed.). Pearson.
- Heard, J., Scoular, C., Duckworth, D., Ramalingam, D., & Teo, I. (2020). *Critical thinking: Skill development framework*. Australian Council for Educational Research.
- Huffman, K. J., Carson, C. L., & Simonds, C. J. (2000). *Critical Thinking Assessment: The Link Between Critical Thinking and Student Application in the Basic Course*. *Basic Communication Course Annual*, 12.
- Jumariati, J., Amelia, R., Elyani, E. P., & Mahendra, T. (2021). Problem-Based Learning: Its Effects on Students' Ability in Writing Expository Essays. *Linguistic Forum*, 3(1), 22–27. <https://doi.org/10.53057/linfo/2021.3.1.5>
- Khazrouni, M. (2019). Assessment for Improving ESL Learners' Writing Skills among Undergraduate Students: A Case Study of Skyline University College. *International Journal of English Language Teaching*, 7(1), 30–44.
- Lai, E. R., & Viering, M. (2012). *Assessing 21st Century Skills: Integrating Research Findings*. National Council on Measurement in Education.
- Nejmaoui, N. (2019). Improving EFL Learners' Critical Thinking Skills in Argumentative Writing. *English Language Teaching*, 12(1), 98–109. <https://doi.org/10.5539/elt.v12n1p98>
- Pantiwati, Y. (2013). Authentic Assessment for Improving Cognitive Skills, Critical-Creative Thinking, and Meta-Cognitive Awareness. *Journal of Education and Practice*, 4(14), 1–9.

- Paul, R., & Elder, L. (2002). *Critical Thinking: Tools for Taking Your Professional and Personal Life*. <http://www.criticalthinking.com>
- Paul, R., & Elder, L. (2007). *Critical Thinking Competency Standards*. Foundation for Critical Thinking Press.
- Rimiene, V. (2002). Assessing and Developing Students' Critical Thinking. *Psychology Learning and Teaching*, 2(1), 17–22.
- Saxton, E., Belanger, S., & Becker, W. (2012). The Critical Thinking Analytic Rubric (CTAR): Investigating Intra-rater Reliability of a Scoring Mechanism for Critical Thinking Performance Assessments. *Assessing Writing*, 17(4), 251–270. <https://doi.org/10.1016/j.asw.2012.07.002>
- Stein, B. S., Haynes, A. F., & Unterstein, J. (2003). *Assessing Critical Thinking Skills*.