

# The Contribution of Language Control Toward Scientific Writing

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### Abstract

The superior human resource can be seen from their productivity activities in a positive way. One of the productivity activities especially in the academic field is to make writing. Basically the skills of scientific writing are supported by the mastery of good logic of language. One of the writing skills used in expressing ideas is in writing scientific articles. Logic if language in this study means as way for the scientific article writers to think systematically. Survey method with correlation technique was used as research method in this research. The population in this study were all students of the Indonesian Language Education Program FKIP UNS. The data collection and writing skills of scientific article were obtained by conducting test techniques with the practice of writing scientific articles, mastering the logic of language with objective tests as much as 40 items. Data analysis technique here included two thing, namely descriptive analysis and inferential analysis. The analysis of inferential data was used simple regression and correlation techniques. Data analysis was conducted in this study and it refered to the concept of simple analysis of regersion correlation. The result of the analysis showed that there was a positive relationship between the logic of the language with the writing of scientific articles (ry1) of 0.42. Furthermore, to know the significance of coefficient correlation, then the T test was done. Based on the results of tests that hade been done, the result showed that the strength of the relationship between tr logic language mastery and scientific skills skill was as much as 4.39 and it was greater than the value of t table as much as 1.651.

Keywords: Logic of Language; Scientific Writingarticle; Correlation; Quantitative

### Introduction

The excellent human resources can be seen from their positive productivity. One of productivity in academic writing is scientific writing. Academicians assume that the best work is a work which is produced through writing. (Dalman., 2012, p. 21) states that writing is a skill that is useful for everyone. Writing skill must be mastered because it has benefits. A person is capable to influence others through writing so he can change the reader lives. The benefit for academics writing activities is capable to deliver an idea to a globalization problem. Based on the future challenge, writing can be an investment to improve human resources. Through this activity, the young generations can maximize the potential of human resources by creating new ideas and communicate it to modernize the nation in various fields of science.

One of the writing skills used in delivering idea is scientific writing of article. Romli (2007, p. 45) states that the essential of writing an article is expressing opinion or idea about a theme. It means writing is an activity to express an idea in scientific writing. Scientific article is an essay or writing which is argumentatively. This statement is based on the research results or theoretical study. Delivering ideas in scientific work must qualify a scientific language. Scientific language must not contradict to logical and empirical (Parera., 2010: 186). The systematical scientific language reflects the systematic of person's thinking.

The rule of scientific language has a function as limiting the breadth of meaning in every scientific sentence. It means to maintain the objectivity of ideas. Scientific language which has a high quality in scientific work lies in the logical elements of the language. Ranjabar (2014., p. 61) argues that one of the benefits of logic is directed in expressing abstract, careful and logic idea. Element of language can be said as language control is an element of language which requires systematic, logic, and contradictive, language of logic in scientific articles have a function to minimize the symptoms of contradictions.

Contradiction is a form of contention in a single statement. Another element which is very influential on the scientific content of a scientific article is a symptom of repetition. Repetition concept does not bring the empirical elements so that the findings or concepts of theory which described were not as solid content. In the writing of scientific articles, repetition of the concept becomes a distortion of scientific article lacks sufficient science content. These elements of logic are important in a scientific article.

In fact, the students are not able yet to write down ideas logically. In formulating an opinion, students tend to compile expert opinions randomly even they are not in line with one another and do not synthesize these opinions. This indicates that the students 'thinking in scientific articles does not have a systematic path". It certainly affects the objectivity of the students' scientific articles. In Hodges, Bichkam, and Seawright (2017., p. 1-15) found that plagiarism in Europe, Asia, Africa, and America have a form of similarity sentence structure. This condition means that the similarity indicates that the students lack the mastery of the logic of language in expressing the content of their thinking.

We can know together that the words and sentences in scientific paper must be analytical sentences, is sentences or statements that contain general truth. Writing of scientific articles avoids the form of synthetic statements of truths based on special observations (not yet generally acknowledged). In addition, the sentence form which is analytical, the logic of language in scientific articles has a function to minimize the symptoms of contradiction. Contradiction is a form of contention in one statement. It is reinforced by Sitepu (2016, p. 12) that the purpose of the article is to communicate the new scientific findings.

Researchers feel the need to do a research about writing scientific articles on the students of Indonesian Language Education UNS who are in the fifth semester considering that they are as students who have a predicate as researcher at the end of their study. Students should have the mastery of good logic of language and maximum scientific attitude in writing an article. Based on the description above, as the background, researchers interested in conducting research with the title: "The relationship between Mastery of Logic of Language and scientific attitude and the Scientific Skill in writing on Students of Indonesian Language Education the fifth semester, UNS Surakarta "Scientific article is one of the scientific works which contain one' s opinion who published work in the mass media, to inform general public (Dalman., 2013: 140). The loading of scientific articles in the mass media can be intended in the publication activities of articles in scientific journals. Publishing ideas to many audiences demand the presentation of scientific articles which are systematic and logical. In general, writing scientific articles

follow the rules or guidelines that have been determined by the organizers of journals that have been set in writing guidelines for the author. A scientific writing has the truth of the content of the paper that can be scientifically accountable and presented scientifically and presented with a scientific language (Afiyanti., Rachmawati., and Milanti., 2015., p. 2). Writing scientific articles using scientific language with the purpose of systematic and logical disclosure of ideas considering the scientific article is a script that must be published for the usefulness of the general audience.

According to Wardani (2007, p. 17) popular scientific paper is scientific paper that presented in the style of a popular or casual language so easily understood by the public and interesting to read. Scientific articles have their own characteristics. These characteristics distinguish scientific articles from other form of scientific articles. Scientific articles tend to be both informative and communicative. In other types of scientific articles, the information presented tends to be rigid and maintain the scientific language. This is precisely the obstacle to the publication of scientific finding. It's a shame when the brilliant findings are just piles of unreadable reports. As Wardani argued above that the scientific article is a popular scientific essay which has a communicative nature. This is because the scientific articles must be included in the list of actual publication so that the ideas which poured is an idea that has novelty and latest elements.

The characteristics of scientific articles can be presented as follows. a) emancipator; b) short; c) appropriate; d) enlightening; f) responsible (Wibowo., 2013, p. 21). Emancipatory is an objective expression of the author's idea without fear of deviating from the previous opinion. The author has the right to express the idea even though the idea is not the same as other previous expert ideas. It is a formation of novelty in a scientific work, especially scientific articles. Brief in scientific articles is a term of solid content or information. The author should pour the idea briefly no need to convoluted. The term "clear" in scientific articles is characteristics that require the author of scientific articles to write with cohesively and coherent. Exactly, the scientific article should focus in a discussion. Enlightening, meaning informative and responsible, having ethics in carrying out the writing. Ethics in the writing can be done by including the source of quotation if the author took ideas from other experts.

Basically it can be said that scientific article is an article of invention reported using a certain methodology which is clear, objective, systematic, and has a high novelty element. Scientific articles are form of reports that must be communicative in order to be able to communicate to the general readers so that the findings can be used directly by audiences. The most crucial characteristic of the scientific is systematic which means having the arrangement in writing or composition with scientific method, objective which means presenting the actual facts in scientific data, and arranged in accordance with the rules of writing in Indonesian language which is good and correct. The scientific article is the result of actual research in a new issue in scholarship. The actual nature of the article should be published. The elements contained in scientific articles which are distinguishable from non-scientific articles. Basically, the skills of scientific writing is supported by the mastery of good logic of language. Logic of language helps the scientific writer to characterize ideas in a logical and systematic way. It is based on the nature of scientific articles that have a scientific language which is logical and special and does not generate multi interpretation. Thus, the mastery of logic of language becomes important to be enhanced by students.

In term of language mastery, logic is a very important element. It is because the logic in the language is closely related to the meaning of a statement in writing. It is based on the principle of writing a scientific article that must be presented in a logical sentence, clear, solid content, and it is not multiple interpretation. Like the opinion of an expert who argues that "In language we must pay attention to logic or can also be called as the logic of language. First, the language logic must satisfy systematic thinking and fulfill the rules of logic. Secondly, the logic of language must satisfy the relationship between the concepts that are linked. Third, the logic of language should not lead to contradiction (Parera., 2010, p.

188). Language has many variations both from casual to formal variations. The language of formal discourse uses logical language. Djojosuroto (2007, p. 177) explained that the language of scientific language must meet the requirements of scientific language with logical, non contradictory and empirical. Scientific language demands the unity of meaning, interpretation and logical relationship.

Koromani (2012, p. 16) stated that the language used in logic is a language that informative because it is associated with the term of right and wrong. There are some requirements about logical statements. Djojosuroto (2007, p. 179) stated that there are tree condition in determining a statement whether it belongs to a logical sentence or not: Analytical thinking; No contradiction; there is no conflict with the context. Karl Popper (2008, p. 30) stated that the theoretical system can be said to be axiomatic (logical) if a set of statements or axioms meet the following points: a) Statements or axioms should be free of contradiction; b) the statement system should be free of any other axiom; c) sufficient deduction; d) does not contain assumption. The logic of language in running its function utilizes the element of deductive logic in constructing theory and utilizing the inductive logic element in drawing conclusion. The deductive draws element of the concatenation of Johnson (1992: 201) which includes disjunctive, conjunctive, categorical syllogism, hypothesis, and dilemma. The inductive conclusion includes generalization, analogies, causalities, differences, combination, and residues. Through the elements of logic, it can be used to measure the logic language mastery in a person. An analytical statement is a phrase whose phenomenon is generally accepted. Furthermore, it does not contain contradiction, is does not contain the opposite meaning of a statement. The importance of logic of language is always closely related to the use of the right composition. Effective sentence editors contain logical statements.

Based on the research of Talebzadeh 2012 described that the study had purposes to investigate the effects of three writing tasks (making sentences, composing writing and closing book tests) of learning vocabulary and trying to compare the effectiveness of this task to see which one has the best effect. The results showed that all three tasks (including language or logic composition) were significantly effective in helping learners to learn new vocabulary. The main purpose of this study was to investigate the possible impact of writing instruction on learning new words which taught. It found that the writing composition has a great effect on learning the vocabulary of a second language. The results showed that the application of strategy of a broader writing composition to promote meaningful learning. The mastery of the composition including the mastery of the logic of language which has a good impact on language skills. Language skills including speaking, reading, listening, and writing require the mastery of the composition. The element of composition mastery which needed in writing is the mastery of logic of language. As the mastery of composition above, the knowledge of writing is very important to be mastered. Knowledge of writing or writing skill, or student's writing knowledge which mentioned above includes the elaboration of the content of writing, the clarity of conveying the content, the use of effective sentences, the use of standard vocabulary, the use of spelling and punctuation, the use of synthesis sentences.

### Methodology

The research method used in this research was survey method with correlation technique. This research was conducted by survey method because of considering the purpose of data collection which to find out whether there was a relationship between the variables Meredith D, Gall, Joyce P, Gall, Walter R Borg (2003: 309). In this study, there were two variables, namely the first variable was logic of language mastery (X) and the dependent variable was the skill of writing scientific articles (Y). The population in this study were all students of the Indonesian Language Education Program FKIP UNS, Surakarta which consisted of 2 classes, each class contained 35 students so that the total population of research were 70 students as respondents. In accordance with the opinion of Arikunto (1998: 120) who explained that if the subjects of research were less than 100, it was better to take them as the population of research. Next if it

were large subjects, it can be taken between 10% -15% or 20% -25% or more. Roscoe in Sekaran (2006: 72) explained that "The larger the number of samples, the less chance of error. For that reason, the researchers took a sample of 50% of the total population (140 respondents) by considering several factors, so that the total samples used in this study were 70 respondents or students. collection and scientific articles writing skills using the practice test techniques with scientific article writing, mastery of the language of logic objective test as many as 40 items.

NO	ASPECT	INDICATORS
1	Emancipator	A. own synthesis adequate theory,
		B. using the most appropriate reference (80%
		journals and textbooks up to the year 2007
		the oldest)
		C. conclude the findings logically
		D. express the arguments by strengthening
		existing theories
2	Cohesion and	A. diction precise
	COHERENCE	B. Big Idea sentence
		C. using conjunctions proper inter and intra
		sentence
		D. using good spelling and correctly according
		to EBI
3	Brightens	A. Do not repeat the information with
		different writing
		B. using the use of relevant research
		C. does not use the phrase synthetic
		D. Do not use the phrase contradictory
4	was responsible	A. menuliska bibliography correctly
		B. write the source on the agency theory
		C. using original idea
		D. using logical data

 Table 1 Grating writing articles scientific

Table 2	Grille	Control	Logic Net
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Table 2 Office Control Logie Net					
Aspects of Logic Speak	Elements	Number Problem			
Logic deductive	Statement	1, 2, 3, 4			
	Negation	5, 6, 7, 8, 17			
	Conjunction	9, 10, 11, 12, 13, 14			
	Disjunction	14, 15, 16			
	quantifier	18, 19, 20, 21			
	Modus Ponen, Tolens, syllogism	22, 23, 24, 25, 26			
	Generalization	27, 28, 29, 30, 31			
	Analogy	32, 33, 34, 35			
	Causation	36, 37, 38, 39, 40			

#### 1. Test Instrument

Before used to retrieve data research, research instruments in the form of tests (scientific article writing skills and mastery of language logic) need to be tested to determine the level of validity and reliability problems. Reliability refers to the degree of reliability of something. Reliability means to be believed, so reliable (Arikunto., 1993: 142) .According Arikunto (1993: 136), validity is a measure that indicates the levels of validity or validity of an instrument. An instrument is said to be valid if it can reveal the data of the variables studied properly.

To test the skill of writing text scientific articles (Y) using the conceptual validity or construct validity, can not be done empirically or using statistics. Validity of construct validity are conceptual or theoretical validity test by looking at the indicators that could be used in the assessment of writing skills text scientific articles. However, to test reliability of scientific writing skills test was conducted with statistical techniques by using reliability ratings. In the logic of language mastery variables using correlation formula *Point biserial* and using *Kuder-Richardson*KR-20 -20 or the results obtained 40 items about the logic language of 45 questions and 5 questions that are not eligible to be used as a measuring instrument mastery of language logic.

#### 2. Hypothesis Testing Data Analysis

Data analysis technique involves two things: descriptive and inferential analysis. Descriptive analysis, intended for the presentation of descriptive data by way of describing the acquisition of data have been processed, ie the central tendency, a tendency deployment, the results of the preparation of the frequency distribution of the value of each variable as well as image frequency histogram, whereas inferential analysis was used to test the hypothesis or conclusion. Inferential data analysis using the technique of regression and correlation analysis (simple). As simple or multiple regression equation to be searched are as follows: simple linear regression form:  $\gamma = \alpha + bX_1$  with the provisions of the terms are accepted hypothesis.

The data collection of writing skills of scientific articles was done by using test techniques through the practice of writing scientific articles, mastering the logic of language with objective tests as much as 40 items. Script writing guideline for scientific articles was based on four indicators, namely emancipatory, cohesion and coherence, enlightening, and responsible. In the objective tests, the logic of language mastery was based on the indicators of dominance of logical sub-variables, namely statement, negation, conjunction, disjunction, quantifier, generalization, analogy, and causation. Before being used to retrieve the research data, the research instruments were in the form of tests (writing skills of scientific articles and mastery of logic language) needed to be tested to determine the level of validity of the item and their reliability. Reliability refers to the level of reliability something. Reliability means trustworthy, reliable (Meredith D., Gall., Joyce P., Gall., Walter R. Borg., 2003: 333).

### Discussions Positive Contribution Logic Language to Improve Writing Scientific Article Skills

Descriptive results from the research which conducted from November 2017-January 2018 it is known that the prices of the 70 students of the research descriptions show the following scores. The descriptive scores of writing scientific articles were as follows. The total score was 5153.75, The mean was 73.63, the median was 73.75, and mode was 73.75, the varians was 72.15, Simp. Raw was 8.49, the maximum value was 97.50, the smallest value was 53.75, and Span 43.75. The descriptive scores of writing scientific articles were as follows. The total score was as much as 31.33, the

Kriteria	Y	Х
Nilai total	5153.75	2193
Mean	73.63	31.33
Median	73.75	31
Modus	73.75	30
Varians	72.15	14.05
Simp. Baku	8.49	3.75
Nilai terbesar	97.50	40
Nilai terkecil	53.75	21
Rentangan	43.75	19

median 31, the mode 30, the variance 14.05, Simp. Baku 3.75, the largest value 40, the smallest value 21, Span 19.

The Data Prerequisites Test In this study, the normality test of data was obtained using Lilliefors technique with Microsoft Excel software which used as test requirements analysis. The normality test of the skill data, namely the writing scientific article text (Y) had a maximum Lo of 0.0169. The calculation of the list of critical values of L for the Lilliefors test with n = 70 and the real level  $\alpha = 0.05$  obtained Lt = 0.1058. Based on the comparison above, it showed that Lo was smaller than Lt, so the null hypothesis was accepted and it could be concluded that the data of scientific article writing skills (Y) come from a normally distributed population. The normality test on the mastery data (X) had a maximum Lo of 0.0046. The calculation from the list of critical values L for the Lilliefors test with n = 70 and the real level  $\alpha = 0.05$ , it was obtained Lt = 0.1058. Based on the comparison above, it appears that Lo was smaller than Lt, so that the null hypothesis was accepted and it could be concluded that population the comparison above, it appears that Lo was smaller than Lt, so that the null hypothesis was accepted and it could be concluded that the logic of language (X) data came from a normally distributed population.

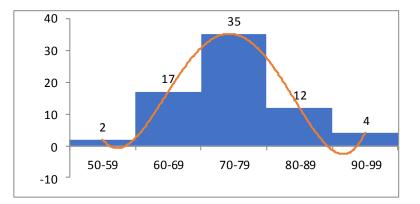


Fig. 1 Hypothesis relationship between the mastery of the language logic and the writing skills of scientific articles

The hypothesis which proposed in this study was "there was a positive relationship between the mastery of the logic of language and the skills of writing scientific articles". Meanwhile, before the hypothesis testing which conducted, first, the significance and linearity of simple regression Y over X was tested Then, determining the equation of the regression to measure the coefficient of value which increased in each variable. Through calculating the regression equation, it could also be used as predictor tool to know the influence of significance of logic of language mastery to increase the writing scores of scientific articles.

The equation  $\hat{Y}=43.46+0.96X$  was obtained as the results of simple linear regression analysis of Y over X. The Anava table for the significance test and linearity regression  $\hat{Y} = 43,46 + 0,96X$ , each made Fo equal to 14,11 and 0,92. The regression equation X to Y could be used as a predictor of the variable that  $\alpha$  symbol is the value of writing score improvement while bX is the value of logic of language mastery, so that it could be explained that the equation  $\hat{Y} = 43.46 + 0.96X$  means that every increase in the skill of writing a scientific article as much as 43.46, followed by the increase of the score of language logic mastery which was as much as 0.96. According to the finding of the equation above, it could be explained that the logic of language had a positive relationship which was significant in influencing the increase of scores or the value of scientific writing skills. This meant that if a person had the ability of good logic of language, he or she will had the skills to write good scientific articles as well.

Furthermore, if the regression equation was known then it was necessary to know the level of significance of the regression equation between X and Y. Based on the calculation of the F distribution list on the real level of  $\alpha = 0.05$  with the numerator 1 and the denominator 68 for the null hypothesis; 1) it showed that the regression was not significant/ meaningless, as a result the Ft = 3.99; and with the dk of the numerator 16 and the denominator 52 for the null hypothesis; 2) It showed that the regression was linear and Ft value was 1.75. The null hypothesis; 1) was rejected because Fo was greater than Ft. In conclusion, the regression coefficient was real so that in terms of this regression, it was significant. In contrast, the null hypothesis; 2) was accepted because Fo was smaller than Ft. Thus, the hypothesis which stated that the regression of Y over X linear was accepted.

Sumber Variasi	Dk	JK	KT	Fo	Ft
Total	70	384423.44	384423.438	-	
Koefisien (a)	1	379444.84	379444.84	-	
Regresi (b/a)	1	897.10	897.10	14.95	3,99
Sisa/residu	68	4081.49	60.0219045		
Tuna cocok	16	901.53	56.35	0.92	1.75
					, · -
Galat	52	3,179.96	61.15		

A simple correlation analysis between the mastery of the logic of language and writing skills of articles, it was obtained the correlation coefficient (ry1) equal to 0.42. Furthermore, to know the significance of correlation coefficient, then t test was done. Based on the results of tests that had been done, it showed that the strength of the relationship between the mastery of the logic of language and scientific writing skill was4.39 which was greater than the t-table as much as 1.651. Based on the results of the analysis, it could be explained that there was positive significant relationship between the mastery

of logic language with scientific writing skills. Therefore, it can be concluded that the null hypothesis (Ho) which stated that "there was no relationship between the mastery of the logic of language and the skill of writing a scientific article" was rejected. In contrast, the alternative hypothesis (H1) which stated that "there was a relationship between the mastery of the logic of language and the skills of writing a scientific article" was accepted. The coefficient of determinant of effective sentence mastery with the skill of writing expositional text was 0.18. This means that about 18.21% of the variance of writing skills for scientific articles can be explained by the mastery of logic of language so that it can be said that the mastery of the logic of language contributed to the ability to write the text of scientific articles as much as 18.21%. Logic is an important element in making scientific articles. Scientific articles have objective and factual characteristics.

Logic is a powerful tool for measuring the objectivity of works, especially in writing scientific papers. Unsure-logic that is the tool of limitation of subjectivity of work is. through the logic of the students' language has a clear conclusion drawing technique of expert opinion used as a reinforcement of their own opinion. making the intellectual mind not only sharper, but also becoming more developed through thinking exercises and analyzing and exposing problems scientifically; getting one to be able to put one in place and to work on a timely basis; enables one to distinguish the most logical benefits between right thought and therefore will produce the right conclusion and wrong thought sequence by itself will display the wrong conclusion. In the study of Oktaria, Andayani, and Saddhono (2017) have the result that effective mastery of sentences has an influence to improve writing skills. Effective sentence mastery has a crucial element that is used language kelogisan has a function to explain the meaning of straightforward in a text. This means that in writing scientific articles require a logical arrangement of sentences so that the meaning of findings that contained scientific articles can be delivered to the fullest.

Logic in scientific articles is used to draw conclusion and explain theoried in valid way. It is reinforced that the function of logic can be very useful in linguistic research. In Szymanik's study (2014) explained that the power of logical explanation is very broad and therefore, it had proved a valuable tool for many disciplines, including the building blocks of cognitive science, such as philosophy, computer science, mathematics, artificial intelligence, and linguistics. Logic has a good track record in providing interesting insights by formalization, and therefore it is very useful in disambiguation psychological theory. Formalizing the formal cognitive theory was not only a source of explicit experimental hypothesis, but also practically provided computational modeling. The most important point, the modern logic has many tools to assess and compare such psychological theories. Writing scientific articles is very necessary to master the logic of language. As in the research of Creath (2016) which had the results of research that the logical expression theory of CArnap in 1993, namely the term of logism, an utterance consists of analytics, valid, and synthesis. The logical sentence is a sentence that has the truth that is recognized in general. Logic utterance has a function as a tool to expose value ideas or facts. In the writing of scientific articles, it needs the existence of emancipatory scientific elements which require researchers or scientific writers to make legitimate conclusion. Indirectly the use of logic of language in making conclusion in an invention or synthesizing a theory is important.

The cruciality location of logic of language on the writing of scientific articles is in the presentation of the language of scientific articles. Articles should be presented in clear, simple, and well structured. Articles must be full of meaning. Another element that is very influential on the scientific content of a scientific article is a symptom of concept repetition. Repetition of the concept does not bring the empirical elements so that the findings or concepts of theory described do not solid content. In the writing of scientific articles, repetition of the concept becomes a distorted scientific principle that are informative. Repetition of the concept occurs because the author of a scientific article lacks sufficient science or knowledge content. Based on the facts in the field, the lack of content of scientific writers encourages them to commit an aberration called fraudulent contracts. A fraudulent contract is the use of the services of a scientific worker who is not necessarily mastering the logic of language. Bertag and

Harper et al (2016), in this researc, it was explained that the plagiarism transaction was difficult to detect and a form of plagiarism. For that reason, such case can be investigated by analyzing the quality of the content of scientific paper. The quality of the content is strongly influenced by the use of coherent logic of language. When we found scientific paper, which do not have the logic of language coincidently allegedly the result of cheating contract. It becomes the importance of mastering the logic of language in writing scientific articles.

#### Conclusion

Based on the results of data analysis and hypothesis testing that had been described above, it can be concluded that the results of this research were as follows, there was a significant positive relationship between the logic of language with the skill of writing scientific articles. The skill of writing scientific articles could be improved through the logic of language improvement. Based on the above conclusion, the researchers here proposed some suggestions which could be given. First, for some lecturers, they have to be able to study students' logic of language mastery to help them to improve their scientific writing skills. In addition, through the knowledge of students' logic of language, lecturers could detect the originality of students' work through the indicators of logic of language.

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