

The Impacts of Scaffolding on Metacognition and Students' Ability of Essays Writing

Herman Budiyo, Elfa Eriyani, Hary Soedarto Harjono, Wiwik Pudjaningsih

Abstract---*This study aimed to examine and describe the effect of scaffolding on the metacognition of writing knowledge and the students' ability to write essays. The research design used was quasi-experiment with pretest and posttest designs. The independent variable of this study was scaffolding learning and the dependent variables were the metacognition of writing knowledge and the students' ability to write essays. The research sample consisted of two groups, which were the experimental class and the control class. The results showed that in general scaffolding writing learning (1) had a significant negative effect on metacognition of writing knowledge of students (sig. 0.012) and (2) significantly positive effect on students' ability of essays writing (0.001). Implications and future research are also discussed.*

Keywords---*essay writing, learning, metacognition, scaffolding*

I. INTRODUCTION

Mastery of writing skills in tertiary institutions (PT), one of it, is through lectures in Indonesian Language courses (MK-BI). The MK-BI is one of the general compulsory subjects (MK-WU) that must be in tertiary institutions (*Permen-Ristekdikti*, 2015). One of the objectives of the MK-BI is "developing academic communication skills in the form of Indonesian language writing for the sake of developing science and technology in the global level". Writing is not an easy task. Abrar et al. (2018), Ahangari, Hejazi, and Razmjou (2014), Astrid et al. (2019), Darzhinova (2019), Lengyel (2019), Erlina et al. (2019), Mukminin, Ali, and Ashari (2015), Marzulina et al. (2019), Nazurty et al. (2019) state that writing is the most challenging task for students. As a skill, Schultz and Fecho (2000) (in Ahangari, Hejazi, & Razmjou, 2014) elaborated that producing a coherent and smooth piece of long writing is a difficult thing to do. This difficulty was felt by almost all students who were completing their final assignments. The constraints of writing skills including the understanding of orthography, sentence structure (grammar), text structure, word choice (diction), and coherence in writing (Sunendar, Cahyani, & Mulyadi, 2014). Added by Imani and Habil (2012), that the main difficulty of students is related to structure or grammar (82%) compared to vocabulary which only (18%). Meanwhile, in writing the chapters which contained in the writing form, the introductory chapter is the most difficult for students, which reached 78%. It can be concluded, in these cases, the ability of students was low.

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Low writing ability is caused by the learning process and student writing habits that have not been effective. Padgett's (1982) research revealed that writing assignments by non-language students were dominated by very few notes and other writing activities (less than 11%). The task of scientific writing includes activities in it. The task of scientific writing tends to prioritize content and ignore the presentation or writing strategy. Padgett (1982) also found that little or no prewriting was done. Thus, it can be said that there is almost no process of providing intensive guidance in writing. The phenomenon above is also found in the students of STKIP YPM Bangko (SYB). The results of the questionnaire delivered to 38 students found that writing activities that were often done by students were answering questions and taking notes. Meanwhile, resume writing activities and scientific essays are rarely done. Writing activities carried out, tend to be without guidance or intensive assistance, both from lecturers or other people who are considered experts. Other facts also reveal that students tend to write based on assignments from lecturers, only about 10% of writing activities were based on students' wishes or initiatives. This is in line with the expression of Lloyd (2007) that students' writing skills are low, motivation is low, and writing habits are also low. The writing learning process in MK-BI at SYB, given in the first semester, lasted for 2 x 50 minutes every week. The lecturers used cooperative learning (involving students), preliminary activities, group work, and class discussions. In the preliminary activities, students pay attention to explanations related to the objectives and benefits of learning as well as the delivery of information in terms of learning material in general. Next, a division of groups and their respective tasks are given.

The lectures that have been held at SYB, have not been able to maximize the ability of scientific writing of students. Of the 10 students interviewed, all of them stated they felt unable to write and did not know how to complete the writing assignment. Furthermore, students explained that they copied more from other people's writing in scientific writing. The learning outcomes that have not been maximized are caused by various factors. According to Slameto (2010), the factors that influence learning are divided into two, which are internal and external. Internal factors are related to all the factors that exist within each individual who are learning, such as physical factors (such as health and fatigue), psychological factors (such as interests, talents, and intelligence). External factors are factors that exist outside the students' individual, which related to the environment of inanimate objects (such as room and temperature settings) and the social environment (such as the social environment of the household, the social environment of the school, and the social environment of the community). Among the various factors that cause the writing ability become not maximal, one of the factors that stands out and can affect all students is the social environment of the school or class. The social environment of the school is arranged by lecturers in such a way as to facilitate students who are physically and psychologically diverse in an effort to achieve learning objectives. These factors, which are intervened, used to see the effect on students' writing ability. One important way to intervene to try is the use of scaffolding in learning. Scaffolding can be used to improve writing skills (e. g., Read 2010, Yeah, Lo, & Huang, 2011, Lloyd 2007, Baradari & Sarfarazi 2001, Bigdeli & Rahimi 2015).

Writing skills are easily mastered by students using scaffolding. Scaffolding has a significant effect on the accuracy of student narrative writing (Bigdeli & Rahimi 2015), summary writing (Ahangari, Hejazi, & Razmjou 2014), procedure description writing (Boldrini & Cattaneo 2014), argumentation writing (Shooshtari & Mir 2014) and scientific writing (Sabet , Tahriri, & Pasand 2013, Ibrahim & Nambiar 2012, Veerappan, Suan, & Sulaiman 2011, Baradari & Sarfarazi 2011, Riazzi & Rezaii 2011). Scaffolding learning steps, as outlined by Hammond (2001), there are four stages, which are: (1) building context, (2) modeling, (3) joint development, and (5) independent writing. The context building stage is done by reading lecture material at home and asking questions in class to strengthen the understanding of the students. Modeling phase is done by reading one scientific writing model then analyzing the structure of the text and the use of the

language. Next, at the joint development stage, students are asked to rewrite the text that is modeled using their own language.

In the "independent writing" stage, students compile their own scientific writing. They plan the work to be written, and then write it, and edit it so that it becomes a complete piece of writing. During the writing process, students are given the opportunity to get scaffolding or help from experts (in this case lecturers) or from their peers. The assistance can be in the form of comments and suggestions in terms of word choice, sentence formation, and paragraph structuring, or relating to the contents of the writing. The details can be seen in the following Table-1.

Table 1. Stages of scaffolding writing learning

Stages of Scaffolding		Learning activities
1	Building Context	Students read information about the structure and characteristics of the text at home before face to face activity. Next, answer questions in writing about the understanding of the text, the use and function of the text, the structure of the text, and the characteristics of the use of language in the text. Question and answer about the definition of text, the function and function of the text, the structure of the text, and the characteristics of the use of language in the text.
2	Modeling	Students read sample texts at home and mark the stages of the text structure and use of the language. Students are guided to recognize the structure of the text and the characteristics of language use (vocabulary, sentences, paragraphs, and spelling) in each text structure. Students are guided to deconstruct the text so that the initial framework of the text is arranged.
3	Cooperative development	Students rewrite deconstructed texts using their own language. During writing, students can receive help from lecturers or from friends in terms of choosing words, composing sentences and paragraphs, and using spelling.
4	Self-writing	Students plan their own essay writing, then write, and edit it. Students can get scaffolding or help from lecturers or from their peers. The assistance can be in the form of comments and suggestions in terms of word choice, sentence formation, paragraph structuring, or relating to the contents of the writing.

Scaffolding is in the form of providing assistance in learning undertaken in the context of completing a task that is not possible to complete on its own. The assistance is gradually reduced until students are able to complete their own tasks. Finally, there is a gradual takeover of responsibility by students so that they become independent learners. Independent learners are responsible for the progress of their own learning. For this reason, metacognition abilities are needed (Suratno, 2011). This is possible because metacognition will make students able to regulate themselves by planning, directing, and evaluating (Suratno, 2011). Learners who have good metacognition skills will realize what they don't know and what they know, will control their own learning, update and develop their knowledge, and using new learning strategies to learn more (Akturk & Sahin, 2011). This research dealt with metacognition of writing knowledge. Metacognition of writing knowledge is a person's ability to know and realize their knowledge of writing. The ability becomes the basis for the metacognition of writing arrangements. Theoretically, Kim (2013) divided metacognition knowledge into three aspects, which are self-knowledge, task knowledge, and strategy knowledge. The description above showed the need of scaffolding experiments to see their effects on metacognition and student writing abilities. To found out and tested how much "the effect of scaffolding on the metacognition of students' writing knowledge and writing ability, the researchers conducted this research at SYB. For this reason, the research hypotheses were as follows: (1) there is effect of scaffolding on the metacognition of scientific essay writing knowledge and (2) there is effect of scaffolding on students' ability to write scientific essays.

AI. METHODS

This study examined the effect of scaffolding learning (the independent variable) on the metacognition of writing knowledge (dependent variable-1) and writing ability (dependent variable-2). The research design used was quasi experiment with pretest and posttest designs. The research sample consisted of two groups, which were the experimental class (English

Education Study Program) and the control class (Economic Education Study Program) SYB. Data collection was carried out with a writing knowledge metacognition questionnaire (A-MPM) and essay writing ability test (T-KME). A-MPM was adapted from a questionnaire developed by Kim (2013) and Metacognitive Awareness Inventory from Schraw and Denisson (1994). The results obtained 50 statements with a composition for each of the six aspects of metacognition on writing knowledge, which from the task aspect (9 statements), personal learning process (10 statements), strategy (10 statements), text and accuracy (8 statements), problem solving (7 statements), and discourse features (6 statements). T-KME was used to collect data on students' essay writing abilities. The T-KME was adapted from the Indonesian Language Proficiency Test (UKBI) writing skills test. T-KME consists of writing 200 essays in 30 minutes. The quality of writing can be seen from the content, structure of essays, paragraphs, sentences, word choices, and the application of spelling. Data analysis was performed with independent parametric t-test statistics and nonparametric statistical Mann Whitney rank test (U Test) with SPSS.

III. RESULTS

Description of Research Samples

The sample of this study was the students of social science education in the first semester of the 2018-2019 Academic Year contracting *MK-BI*. The experimental class (KE) was *PS-PBI* students (27 people), the average UN-BI score: 64.61; and the control class were *PS-PE* students (22 people), the average UN-BK score: 64.65.

Description of Preliminary Test Results on Writing Ability

Preliminary tests are given to students (A) *PS-PBI*, (B) *PS-PLS* and (C) *PS-PE*. Results of the Preliminary test are scored following the TEEP Weir scale (Weigle, 2002) with a maximum score of 28. The central tendency of the Preliminary test results is presented in Table-2

Table 2. Comparison of preliminary tests for essay writing in three classes

Class	N	Mean	Median	Modus
A	28	9.179	9.5	7
B	24	8.5	8	7
C	27	8.593	8	7

Table 2 informed the number of samples for each class, the mean, median, and mode of each class. The mode or value that often appears in all three classes was the same, which was 7, while the median or middle value of class A was 9.5, and class B and class C were the same median, which was 8. The average values of the three classes were relatively the same, i.e., sequential for class A, B, and C were 9,179, 8.5, and 8,593. Furthermore, the results of this preliminary test were analyzed using the Kruskal Wallis test with SPSS. This test was used for comparative analysis of more than two independent samples with ordinal type data and the sample size is not the same (Siregar, 2015). This formula was used because the initial test data of writing ability in the three classes did not meet the normality requirements, and the sample of the three classes was not the same. The hypotheses to be tested were: (1) H_0 : there was no difference in the ability to write *PS-PBI*, *PS-PLS*, and *PS-PE* student essays. (2) H_A : there were significant differences in the ability to write essays for *PS-PBI*, *PS-PLS*, and *PS-PE* students. The Chi-square value was 2,344. The value of X_{table} for significance level of 0.05 is seen in the Chi-square table (X_{table} : 0.05: 3-1) which was 5.991. Thus, it means that the value of X_{count} 2,344 < X_{table} 5,991, H_0 was accepted, there was no difference in the ability to write essays for students in English Education (PBI), Non-School Education (PLS), and Economic Education (PE) classes. This showed that the writing ability of the third class students was relatively the same, not showing a significant difference.

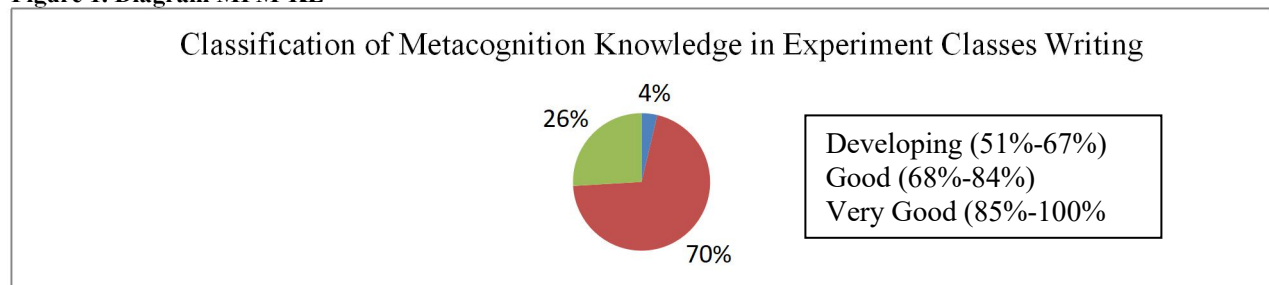
Description of Student Metacognition on Writing Knowledge (MPM-M)

A questionnaire with 38 statement items was used to measure The MPM-M. Each statement was responded by choosing one of the six answer choices, which were numbers 1 (Strongly Disagree), 2 (Disagree), 3 (Somewhat Disagree), 4 (Agree Agree), 5 (Agree), and 6 (Strongly Agree) Agree). The score of each student was obtained by summing the score of each item statement of each student. The ideal score that a student might get was $6 \times 38 = 228$. For the importance of classification, the score was converted to a percentage, which the score obtained divided by the *ideal score multiplied by one hundred*.

Metacognition of Experimental Writing Class Knowledge(MPM-KE)

The MPM-KE score was 142-209, the ideal score was 228, the average: 180, and the standard deviation: 15.92. Frequency distribution and classification of diversity MPMM scores, both: 70%; very good: 26%; and growing: 4%. The description was as in Figure 1: The following MPM-KE diagram.

Figure 1. Diagram MPM-KE

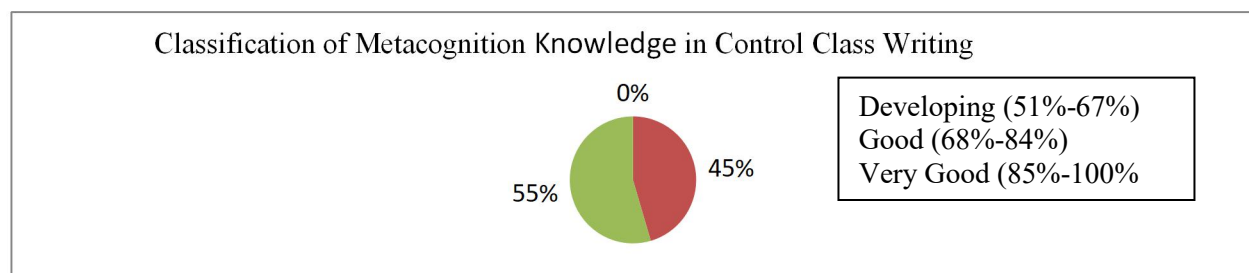


Based on the diagram in Figure 1, it appeared that the MPM-KE score occupies the widest area in the Good, followed Very Good, and Developing categories.

Metacognition Knowledge of Writing Control Classes (MPM-KK)

The MPM-KK score was at 158-212, the ideal score was 228, the average: 192, and the standard deviation: 14.9. Frequency distribution and classification of diversity MPM-M scores, both: 55%; very good: 45%; and growing: 0%. The description was as in Figure 2: The following MPM-KK diagram.

Figure 2. Diagram MPM-KK



Based on the diagram in Figure 2, it can be seen that the MPM-KK score occupies the Very Good category greater than the Good category area.

Final Test Description of Student Essay Writing Ability

The students' ability to write essays was measured by asking students to compose essays with a minimum of 200 words in 30 minutes. Students' writing in the form of their opinion about writing was arranged following the structure of the "thesis / statement-argumentation-reiteration". The quality of writing was seen from the structure, paragraph structure, effective sentence structure, word selection, and the use of spelling and punctuation. Posts are rated twice in one month intervals. For

reliability, both assessments were tested for interrater reliability using the SPSS Kappa test. The results of the calculations were presented in Table 4: Results of Interrater Reliability Tests below.

Table 3. Results of interrater reliability tests

Symmetric Measures					
		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Measure of Agreement	Kappa	.857	.054	15.824	.000
N of Valid Cases		49			

a. Not assuming the null hypothesis.

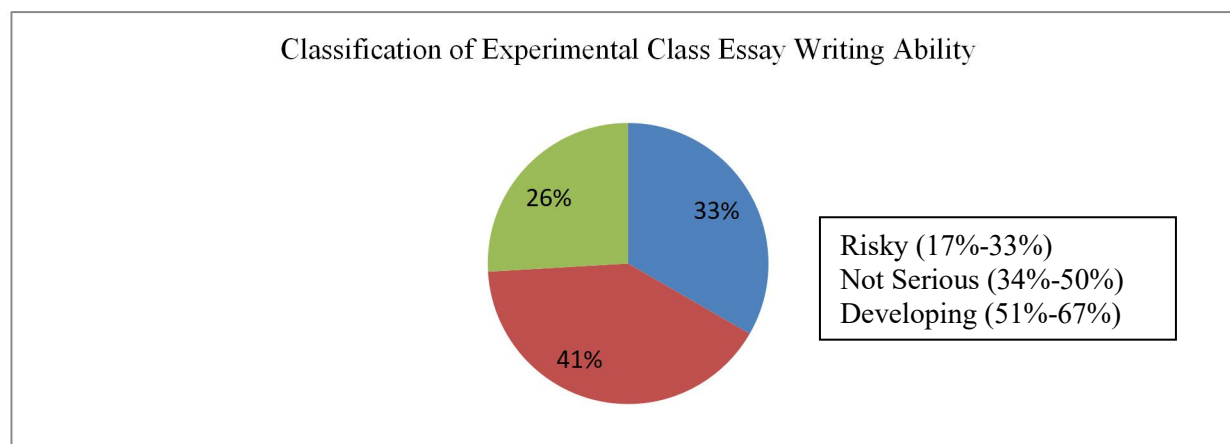
b. Using the asymptotic standard error assuming the null hypothesis.

Based on Table 3, Known that the Kappa coefficient is 0.857, including the Almost Perfect Agreement category (Landis & Koch, 1977). Coefficient of $0.857 > 0.6$, means there was a similarity between the first assessment and the second assessment. In other words, writing assessment has fulfilled the reliable requirements. Next, the first grading score and the second grading are summed. Writing ability scores for each class are described below.

Experimental Class Essay Writing Ability (KME-KE)

Final test of writing ability on Experimental class (KE) from 27 students, the results: score 15-36, ideal score: 56; average: 23.37, and standard deviation: 6.868. There were only three categories of students' writing ability from the six categories that delivered by Green (in Suratno, 2011). Most 41% of students were categorized as: Not Serious; 33% categorized: Developing; and 26% of students were at risk. Thus, Experimental class (KE) students' writing ability can be categorized as "Not Serious", because most students fall into this category. For more details, consider Figure 3: The KME diagram in the following Experimental class (KE).

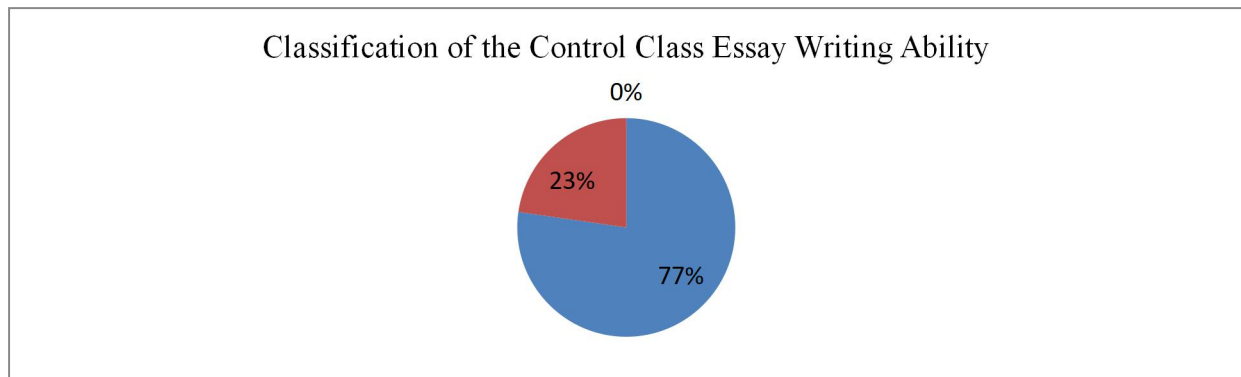
Figure 3. Essay Writing ability diagram on experimental class (KE)



Control Class Essay Writing Ability (KME-KK)

The final test of essay writing ability on the Control Class (KK) of 22 students, the results: score 14-24, ideal score: 56; average: 17.41, and standard deviation: 3.187. There were only two KME students in the six categories submitted by Green (in Suratno, 2011). Most of the 77% of students were categorized: at risk and 23% are categorized as: Not Serious. Thus, *Essay Writing Ability of Control Class (KK)* students were at risk, pay attention to Figure 4: The KME diagram in the following KK.

Figure 4: Essay Writing Ability diagram for Control Class



The diagram in Figure 4 informed that the ability to write a control class essay consists of two groups, which was Not Serious and Risky.

Prerequisite Test

Normality test, in this study, tests were conducted on the data of essay writing ability and metacognition data on writing knowledge on experimental class (KE) and control class (KK). Testing uses liliefors test. The hypotheses tested are as follows:

HO: data was normally distributed H_o : data berdistribusi normal

Ha: data not normally distributed H_a : data berdistribusi normal

Data was stated as normal distribution if the significance value obtained was greater than the real level of 0.05. Meanwhile, if the significance value was smaller than the real level of 0.05, then the data was declared to have an abnormal distribution. The diagram in Figure 4 informed that the ability to write a control class essay consists of two groups, which were Not Serious and Clean. Data was stated normally distributed if the significance value obtained was greater than the real level of 0.05. Meanwhile, if the significance value was smaller than the real level of 0.05, then the data was declared to have an abnormal distribution.

Writing Knowledge Metacognition Data (D-MPM)

MPM data were tested using the Liliefors test. The results are presented in Table 4

MPM Data Normality Test Results.

Table 4. MPM data normality test results

		Tests of Normality				
		Kolmogorov-Smirnov ^a			Shapiro-Wilk	
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental	.119	22	.200 [*]	.981	22	.931
Controlled	.154	22	.191	.925	22	.098

a. Lilliefors Significance Correction

• This is a lower bound of the true Significance

MPM data on KE and KK apparently fulfilled the normality requirements because their significance values were 0.200 and 0.191, respectively, greater than 0.05.

Essay Writing Ability Data (D-KME)

The results of the D-KME normality test in the experimental class (KE) and control class (KK) data have an abnormal distribution of data, as in Table 5: The following D-KME normality test.

Table 5. D-KME normality test

Class	Sign	α	Description
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Experimental	0,045	0,05	Not Normal
Control	0,009	0,05	Not Normal

Homogeneity Variance Test

Homogeneity test was conducted to test the similarity of KME and MPM data variance in KE and KK. Homogeneity testing uses the levene statistical formula. The following hypothesis is tested.

$$H_o: \sigma_t^2 = \sigma_c^2$$

$$H_a: \sigma_t^2 \neq \sigma_c^2$$

description:

$$\sigma_t^2 = \text{variance of the experimental group}$$

$$\sigma_c^2 = \text{control group variance}$$

Criteria data was said to have a homogeneous variance if the significance obtained was greater than the real level of 0.05. Homogeneity test results using SPSS are presented in Table 6: D-MPM Homogeneity Test and Table 7: D-KME Homogeneity Test.

Table 6. D-MPM homogeneity test

Test of Homogeneity of Variance			
Metacognition			
Levene Statistic	Df1	Df2	Sig.
.122	1	47	.729

Table 6 informed that the significance value obtained was 0.729 greater than 0.05. Means, D-MPM based on experimental class (KE) and control class (KK) variables had the same or homogeneous variants.

Table 7. D-KME homogeneity test

No	Homogeneity test result	Sign	α	Description
1	All classes (experimental dan control classes)	0,000	0,05	Not Homogen

Based on Table 7, it is known that D-KME in all experimental class (KE) and overall control class (KK) has a homogeneous variance. The significance values of both are 0,000 and 0.002 less than 0.05.

Hypothesis Test

Hypothesis test used parametric and nonparametric statistics. The selection was based on the normality and homogeneity of the data. Prerequisite testing that has been done states that not all students' KME data meet the requirements for normality and homogeneity. Therefore, hypothesis test uses an independent t test and the Mann-Whitney test.

Metacognition of Scaffolding Learning and Writing Knowledge

The first hypothesis was, "scaffolding learning has a significant effect on the metacognition of students' writing knowledge". Based on prerequisite testing, D-MPM had a normal distribution and homogeneous variance. Thus, this hypothesis was tested using independent parametric t-test statistics with SPSS. This test is used to test the comparison of MPM scores between experimental class (KE) and control class (KK) (Siregar, 2015).

The hypotheses tested were formulated in sentences and in the form of statistical models.

Ho: $\mu_1 = \mu_2$, there was no significant difference in the average value between the final test metacognition of writing knowledge of the experimental class and the control class.

HA. $\mu_1 \neq \mu_2$, there was a significant difference in the average value between the final test metacognition of the writing knowledge of the experimental class and the control class.

The significance level applied was 0.05 and the rules of significance testing were as follows.

Ho was accepted, if $-t_{table} \leq t_{hitung} \leq t_{table}$.

The basis for decision making can also be done based on the significance value. If the significance value or Sig. (2-tailed) was greater than 0.05, then Ho was accepted.

Meanwhile, if the significance value or Sig. (2-tailed) was less than 0.05, then Ho was rejected (not accepted).

Table 8. MPM statistics

Group Statistics					
	Classes	N	Mean	Std. Deviation	Std. error Mean
Metacognition	Experimental Class	27	180.44	15.919.	3.064
Writing Knowledge	Controlled Class	22	192.05	14.911	3.179

Based on Table 8 MPM statistics above, it is known that the SPSS calculation above showed the comparison of the average and standard deviation of MPM in experimental class (KE) and control class (KK). The average MPM at KE: 180.44 was smaller than the KK average, which was 192.05. The standard deviation (SD) of KE was 15,929 and KK was 14,911.

Table 9. MPM difference test results

Class	Average	T-Hitung	T-Tabel	Sig.
MPM in experimental class 180.44 (KE)		-2.610	2.01174	0.012
MPM in control class (KK) 192.05				

Based on the Independent Sample Test table, it is known that the MPM count was -2,610. The value of the table at df 47 ($n-2 = 49 - 2$) is 2.01174. Thus, $t_{count} < -t_{table}$ and sig. (2-tailed) was $0.012 < 0.05$ so that Ho was rejected and Ha is accepted. There was a significant difference in the final MPM test scores on experimental class (KE) and control class (KK). This means that scaffolding learning had an effect on student MPM. The effect was seen in the difference in the average MPM score, which was a significant difference between experimental class (KE) and control class (KK). The average score shows that the MPM on control class was higher than experimental class, the difference $192.05 - 180.44$ is 11.61. At the time of the preliminary test, the MPM scores of the two classes did not differ significantly, although the control class average was higher than experimental class. The difference is only $168.36 - 166.44 = 1.92$. Means, experimental class has increased less than control class. Means, the effect of scaffolding learning was negative on student MPM.

Scaffolding Learning and Essay Writing Ability

The second hypothesis was, "there is the effect of scaffolding on the ability to write student essays". This hypothesis was tested using the statistical "nonparametric Mann Whitney rank test (U Test)" with SPSS. Nonparametric tests were used because the data were not normal and not homogeneous, while the U Test was used to compare two independent samples (Siregar, 389).

The hypothesis to be tested was formulated in the form of a statistical model, namely:

Ho: $\mu_1 = \mu_2$, There was no difference in the average ability to write student essays between the experimental class and the control class

Ha: $\mu_1 \neq \mu_2$, there were differences in the average ability to write essays in experimental class and control class students.

The significance level applied was 0.05 and the rules of significance testing were: H_0 was accepted, if $-Z_{table} \leq Z_{hitung} \leq Z_{table}$, and if probability ≥ 0.05 . The results of the analysis using SPSS with the Mann Whitney rank test are presented in Table 10: The following KME rating.

Tabel 10. Rank of KME

class	Average Score	Average rank	Z-Hitung	Z-Tabel	Sig.
Experimental (KE)	23.37	30.93			
Control (KK)	17.41	17.7359	-3.229	1.96	0.001

On Table 10, it is known that the average KE score: 23.37 and KK: 17.41, while the mean rank of KE is: 30.93 and KK was 17.73. Z_{hitung} value obtained was -3.229. The value of Z_{table} at the real level of 0.05 was $1 - 0.05 / 2 = 1 - 0.025 = 0.975$. The value 0.975 in the "Normal Distribution" table was 1.96. Thus, it means that the value of Z_{hitung} -3.229 was smaller than $-Z_{table}$ -1.96 so that the value of Z_{hitung} was in the rejection region of H_0 . The significance value in the Asymp column. Sig. (2-tailed) for the two-tailed test was 0.001 smaller than 0.05. Means that H_0 was rejected and H_a was accepted, there was a significant difference between KME in experimental class (KE) and control class (KK). The significant difference in the average between ME and KK, and the average value of KE higher than KK, can be interpreted that scaffolding learning had a significant positive effect on KME. Student KME on EC increased significantly from an average of 18.15 to 23.37, while KK learning using cooperative learning only increased from 17.18 to 17.41.

IV. DISCUSSION

This study examined two hypotheses: (1) the effect of scaffolding learning on students' metacognition of writing knowledge (MPM) and (2) the effect of scaffolding learning on students' essay writing ability (KME). The study was conducted involving one experimental class (KE) and one control class (KK) in the 2018-2019 semester of MK-BI lecture. KE learning used scaffolding learning steps, which consist of (1) context recognition, (2) modeling, (3) joint development, and (4) independent writing. KK learned to use "cooperative learning". The results showed that scaffolding learning affected the KME of students. Students who learn to use scaffolding have higher abilities than classes that do not use scaffolding. However, scaffolding learning only affects the KME of students with high MPM, and does not affect the KME of students with low MPM. The following is a discussion of the results of this study. The statistical tests found a significant difference in the average MPM score on experimental class (KE) and control class (KK). The average score showed that the MPM on KK was higher than EC, the difference 192.05 minus 180.44 is 11.61. At the time of the preliminary test, the MPM scores of the two classes did not differ significantly even though the KK average was higher than EC. The difference was 168.36 - 166.44 = 1.92. Means, EC has increased less than KK. Why does experimental class that follows scaffolding learning experience metacognition lower than the control class? This situation needs to be explained. Holton and Clarke (2006) state that "... that scaffolding and metacognition draw upon the same set of actions.The external dialogue of scaffolding becomes the inner dialogue of metacognition. "Scaffolding and metacognition are the same set of actions, the external dialogue that occurs in the scaffolding process becomes an inner dialogue on metacognition. Thus, metacognition is formed through external dialogue between students and lecturers or colleagues. Its formation is gradual and requires sufficient time to make a person realize the extent of his knowledge. To be able to realize what is already known and what is not yet known, or to carry out writing assignments with awareness, students need to be given specific scaffolding measures of writing metacognition (Holton & Clarke, 2006).

Scaffolding learning which done was more focused on scaffolding writing, not devoted to providing MPM scaffolding. Experimental Class learning consists of four learning steps aimed at improving KME. The activity begins with an introduction to the context of a particular writing, writing modeling, developing joint writing, and developing writing independently. So, scaffolding learning is not explicitly aimed at improving metacognition. Then, why can MPM in control class who learn to use group learning, can increase beyond Experimental Class?. To found the answer, a search was carried out on the KME of

students who were associated with their metacognition scores. The 45 respondent received the highest metacognition score in both classes, which was 212; on the other hand, the ability to write gets the lowest score, i.e. 14. The writing does not meet the adequacy and relevance of the content, unclear organization, no cohesion, insufficient use of vocabulary, unclear grammar and many are found inaccurate use of spelling and punctuation. This fact implied that the person concerned did not understand how to respond to the questionnaire or was influenced by negligence. There was an impression; students tend to rush to respond to the questionnaire, without thinking about the purpose of each questionnaire statement. As a result, they provide responses that are not in accordance with the actual situation. This is as revealed by Aktur and Sahin (2011) that one of the basic weaknesses of the questionnaire is the possibility that respondents are reluctant to express their ideas and experiences, and the questionnaire statement is not fully understood by all respondents. Measurement of MPM that describes the actual reality is indeed difficult, because metacognition is an internal behavior (Aktur & Sahin, 2011). Metacognition is not an explicit behavior that is easily observed by others, even the individual concerned is often unaware of the process. This situation can also occur in students so that they did not respond to the questionnaire in accordance with the reality.

The findings of this study state that scaffolding had a significant negative effect on the MPM of students, and specifically affected on the aspects of personal learning, strategy, and problem solving. That was, students who have high MPM tend to have low KME. This finding will cause a long discussion because it is contrary to the theory and findings of previous research.

Cuevas, Fiore, and Ose (2002) found that scaffolding by using diagrams in a computer-based learning environment was effective in increasing students' metacognition, especially in meta comprehension (the ability to monitor comprehension), and the strongest influence was found in students with low verbal ability. Scaffolding Cuevas, Fiore, and Ose (2002) used computer-based diagrams, which are intended for scaffolding meta comprehension. Theoretically, Holton & Clarke (2006) explained that scaffolding can be done by external agents and internal agents. An external agent is another person who provides assistance to learners to be able to complete certain tasks. Assistance provided by external agents in the form of actions that make the internal agent (self-learner) can complete the task independently. Holton & Clarke (2006) call that internal agent metacognition. So, scaffolding given by the teacher (lecturer) by itself is more aimed at building learners' metacognition so that they can complete assignments independently. In this study, metacognition in question is metacognition of writing knowledge, that the ability of students to know and realize their writing knowledge, which can be utilized in completing writing assignments starting from the pre-writing (planning), writing (controlling), and post-writing (evaluation) stages. In writing scaffolding learning, this ability is also a target of learning, students are expected to be able to write independently. That is, scaffolding should have a positive effect on the metacognition of students' writing knowledge. However, the opposite happened. There are several factors which are suspected as the cause. The first factor, the aspects measured. This study only measures knowledge metacognition, ignoring regulatory metacognition. Metacognition Knowledge was only related to students' awareness of what they know, while (allegations) what they know was not yet used as a basis for implementing arrangements.

For example, students responded "strongly agree" to the statement "I realize the need for planning writing activities". In this case, students were very aware that planning was needed in writing activities. Thus, they must compile writing plans before writing. However, in writing practice, students do not prepare their writing plans. From observations, they appear to have written right away, some are pensive or thinking, but no one has written down their written plans. However, it is not certain that they did not draw up a plan. It is possible for students to make plans directly in their memory, without writing them down. It is not monitored, so it cannot be used as an excuse. To be able to monitor the metacognition of students as a whole was indeed difficult. Schraw (in Aktur & Sahin, 2011) acknowledges this difficulty and stated that there is no one method that can be used to measure the metacognition process. Aktur & Sahin (2011) also stated that "there is no single tool that can measure metacognition alone". Tobias and Everson (2002 in Aktur & Sahin, 2011) stated that metacognition is measured using several methods, namely observation, dialogue, and individual self-report. Various methods are

recommended to be used to measure metacognition. This relates to the weakness of self-report in the form of a questionnaire, although it is most often used. The basic weakness of self-report in the form of a questionnaire is that there is a possibility that students are reluctant to express their ideas or experiences, or the possibility of a questionnaire is not fully understood by all students (Baker & Cerro in Aktur & Sahin, 2011).

Scaffolding is a help given by people who are more competent to learners to be able to learn and complete tasks that cannot be solved by themselves. Challenging and complex assignments are needed by students to develop their full potential. One task that is considered difficult and plays an important role in the success of student studies is the task of writing. The findings of this study suggest that scaffolding has an effect on student KME. There was a significant difference in KME in Indonesian educational students who learn to use scaffolding compared to those who learn to use group learning. This finding confirms previous research findings which stated that scaffolding has a significant influence on students' scientific writing ability in the context of learning English for foreign speakers, including the findings of Baradari and Sarfarazi (2011), Riazi, and Rezaii, (2011), and Sabet, Tahriri, and Pasand (2013). Baradari and Sarfarazi (2011) stated that scaffolding has a positive influence on students' writing abilities. These findings also confirm the findings of Veerappan, Suan, and Sulaiman (2011), who concluded that the application of scaffolding strategies can improve the ability to write the journals of 3 undergraduate students. So, this finding corroborates previous findings by proving that scaffolding also has a positive effect on the ability to write in the context of Indonesian scientific writing for Indonesian students. The influence of scaffolding is also recognized by students, who stated that the learning carried out makes them recognize the structure of writing and realize the importance of vocabulary selection, the use of spelling and punctuation correctly. This was revealed from their speech during the following focus group discussions.

... With such learning, of course, it has a big impact on my scientific writing skills. ... I began to know oh so this is the structure of scientific texts. ... If the spelling of my language is getting better and better ..., I feel that my language is not only good, but also true. ... Since then I have been able to understand it, oo this is a good language, oo this is the correct language. And also I feel like my EYD, like the English term, my vocabulary, is getting more and more like that. (R-20)

The above quote is the answer given by R-20 during the discussion about the effect of scaffolding learning, with the stages of context recognition, modeling, joint development, and independent development, on their essay writing skills. R-20 said that the learning had a great impact on his writing ability. R-20 became familiar with the structure of scientific work and understood the correct use of language, which had to follow the rules of using spelling and punctuation and vocabulary selection. The opinion of R-20 was justified by other colleagues. R-15 added that R-15 was actually lazy on reading and writing, but learning using scaffolding made R-15 involved in reading and writing activities.

So, like it or not, I have to open a book, read it, analyze it. So I came to understand what you teach, what is there, what the structures of scientific work are, or what you teach for scientific writing. Also my language got better later on. I wrote too. Yes, I'm still lazy, it's just that my grades will drop so I have to write it. From there I learned it, ma'am.

In different words, the five students involved in the discussion admitted that scaffolding learning made them, either voluntary or forced, involved in reading and writing activities so that it had a positive effect on their scientific writing abilities. The increase in KME of Experimental Class is possible because in scaffolding learning, students are not only given an understanding of the meaning and characteristics of writing. However, they also read and analyze examples of writing that they will produce through the modeling stage. This method makes them know how other people compile and develop a written idea. The way that has been learned is applied in the joint development stage. Here, students practice rewriting the writing they have read, or reconstructing the writings of others with their own language. This stage of activity can be likened to the activity of a child who learns to walk by being held by an older person. At certain times, the grip is released so that the

child practices to maintain his own balance. After practicing under the guidance of other people's writing, students develop their own ideas and forms of writing. They can apply the methods that have been proven successfully used by others in the development of their work. At this stage, even though macro scaffolding has been withdrawn, micro scaffolding or individual assistance is still provided according to student needs.

V. CONCLUSIONS AND RECOMMENDATIONS

Scaffolding learning significantly influenced the MPM of non-Indonesian educational students in SYB Jambi. However, the effect was negative because the average MPM score on experimental class was smaller than control class. Significant influence was found mainly on aspects of personal learning, strategy, and problem solving. Meanwhile, on the aspect of assignments, text and accuracy, as well as discourse features, scaffolding learning had no effect even though the average control class was higher than experimental class. Writing scaffolding learning had a significant positive effect on KME of non-Indonesian educational students at SYB Jambi. The effect of scaffolding learning on the aspects of writing ability was not the same. Significant influence on aspects of content, vocabulary, grammar, mechanical I (punctuation), and mechanical II (use of letters and writing words). Meanwhile, scaffolding learning had no proven effect on organizational aspects and cohesion. However, the average Experimental class was greater than the average control class in all aspects.

Based on the research conclusions, several suggestions were given to related parties, such as MK-BI lecturers, heads of study programs or institutions of higher education, and other researchers. (1) It is recommended that MK-BI lecturers use writing scaffolding learning as a variation of learning methods so that students' writing skills can be improved. Maximal result might be obtained if scaffolding learning is used for a longer period and involves many lecturers so that students become accustomed to writing so that their writing skills become better. (2) Considering that writing is needed by students in all subjects, it is recommended that the study program or the competent university institution encourage all lecturers to provide scaffolding of students' writing abilities. That is, all lecturers are given the responsibility to improve students' writing skills, especially by providing scaffolding when assigning students to work on paper assignments or completing written examinations and final assignments. (3) Scaffolding learning had a negative effect on student MPM. This is contrary to the theories and findings of previous studies. In the discussion it was revealed that, at least, there were two factors of concern which are the data collection tool factor and the respondent factor. Metacognition is difficult to measure using one technique, the use of observation and dialogue in addition to self-reports will be able to measure metacognition simultaneously. The respondent factor is related to the possibility of reluctance to express ideas and experiences or not fully understanding the questionnaire statement. For this reason, a deeper study is needed to provide an explanation of the phenomenon. Therefore, further researchers are advised to use several metacognition measurement techniques to scientifically reveal the inaccuracies of the findings of this study with existing theories.

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