

Research Article

Ability to Write Scientifically with a Local Base Through the Application of the Drill Method of Mathematics

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Abstract.

The problems found in the students' writings were the use of Indonesian grammar that was not standardized, the use of incorrect punctuation, and the lack of scientific principles in writing proposals. The ideas written have not been systematic and they are not able to develop the ideas in writing activities, so students find it difficult to complete. This research aims to develop students' writing skills based on local wisdom through the drill method, by conducting an experimental research type of two classes. The instrument used was a writing test and the data were analyzed using the t test at a significant level of 5%. Before conducting the t test, a prerequisite test was carried out, namely the normality test of the data and the homogeneity test. The results showed that the value of t arithmetic is greater than t table so that the accepted hypothesis is an alternative hypothesis, which means that the drill method can develop students' scientific writing skills.

Keywords: ability to write scientifically, application of the drill, mathematics.

1. INTRODUCTION

Writing is one of the important skills that must be mastered by students as prospective teachers. Since students will face various writing tasks such as working on assignments in the form of papers, compiling practicum reports, compiling research proposals and compiling thesis final assignments. These tasks cannot be avoided by students because they are part of the lectures that must be done [1, 2], stated that writing is an important skill to be used in all fields of science. Besides, writing is a means to think in developing insight, a means of da'wah and as a place for self-actualization [3]. Writing is a process of expressing ideas and ideas in written form that contains information that is conveyed to the reader, writing is one of the important aspects in the communication process

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because with well-written writing it will be easy for readers to understand the content of the message contained in the writing. The scientific writing is a work that contains a particular problem by using scientific principles [4, 5]. The scientific rules are to use the scientific method to discuss problems, use standard language in presenting studies, and writing must refer to scientific principles, namely being objective, logical, empirical, systematic, straightforward, clear and consistent.

In linguistics, there are four skills that must be mastered, such as reading, writing, listening and speaking skills. From those four skills writing is the most difficult skill to master for both teachers, students' and students. The skill with the most problems is writing skill stated that writing skills are considered as one of the most complicated skills to teach because writing skills are the most complex cognitive activities and require students to pay attention to sentence structure, content, vocabulary, punctuation, and spelling together [6]. The problem here is that it is difficult to learn and teach [7], found that the problem that students have not been able to produce papers that match the criteria and in writing thesis students have not been able to describe ideas and ideas appropriately. Problem among students that writing activities were still low [8–10]. This is supported by minimal student publication of the data. The same problem was experienced by [11] and [12] as lecturers in the linguistics study program. Before teaching, first give preliminary test related to writing skills. The results obtained indicate that the students' writing ability is low. [13], found problems for students who were mentored, such as students having difficulty in writing papers, reports and etc. Many found corrections from supervisors related to the contents of student thesis. Another problem found [14] is that in writing, students find many problems in expressing ideas and ideas correctly, not being able to link ideas between paragraphs, not being able to use standard grammar correctly and the use of conjunctions and punctuation is not appropriate. The results of research that students' thesis writing skills are still low and have not been entrenched [15–17]. The problems found are (1) students have not been able to develop ideas; (2) students in completing papers are not in accordance with the systematics and as a result seem messy; (3) use of inappropriate grammar; (4) there are still writings that are not in accordance with the PUEBI. From the various problems found above, it is not much different from the problems that researchers found where students had difficulty completing the assignments or reports given [18].

Difficulties in writing the assignment caused students to be late in submitting assignments. In addition, being late in submitting, the contents of the writing did not match with the format and the ideas expressed were not appropriate. From these various problems, the solution used is to apply the drill method. The drill method is a method

that can actively involve students to do exercises repeatedly [19, 20]. The drill method is a method that can help students to understand the material or skills in accordance with the habits that are given continuously [19, 21, 22]. Drills method is a method that can instill habits in students as a result of providing continuous training [23, 24]. The practice method is a teaching method that can help students who have learning difficulties [25, 26]. By giving practice repeatedly so students get used to it, and able to overcome the difficulties encountered. Stated that learning to write is learning that requires high skills. These skills can be obtained from study habits such as continuous practice given in the learning process.

2. RESEARCH METHOD

The research is experimental research design, the population were the sixth semester students which are consist of two classes at Writing Scientific Research lesson. The sample was taken from all population to be the control and experimental class. Therefore, Tabel 1. show the design of the research was Pretest-posttest group design.

TABLE 1: Research design.

Group/Class	First test		Action	Final test
Control	√		-	√
Experiment	√		√	√

From the two sample groups above, one group was used as the control/comparison class and the experimental class. The experimental group will be applied the drill method in learning. Both groups were given a pre-test and a final test to determine the students' scientific writing ability. The research hypotheses are:

H_a : There is an effect of using the drill method on the development of students' writing skills in scientific writing courses

H_o : There is no effect of the application of the drill method on the development of students' scientific writing skills in the course of writing scientific papers

The instrument used is in the form of an essay test to write a scientific paper (composing a research proposal) related to a general theme: the implementation of local wisdom from the Bima area in learning at school. The indicators set regarding students' writing abilities shows Table 2.

Data analysis to test the research hypothesis using t test at a significant level of 5%. Hypothesis testing using t test with criteria if the value of t count is greater than t table then the alternative hypothesis (H_a) is accepted and H_o is rejected. The hypothesis

TABLE 2: Scientific work assessment indicators.

No	Indicator
1	Systematical Based
2	The Use of Appropriate Ideas
3	The use of Appropriate Language Style
4	The Interesting of Writing

testing in this study using the help of the SPSS program. 16. Before the t-test is carried out, the normality and homogeneity tests are carried out first. Test the normality of the data using Kolmogorov Smirnov. Homogeneity test is used to prove two homogeneous samples, the data can be searched using the F-test formula, namely:

F = The variance is the calculated mean of the squared deviation of each data to the calculated mean. With the test criteria if F count means not homogeneous and if F count means homogeneous at a significant level of 5% (Sugiyono, 2009: 197). To calculate the effectiveness of the application of teaching materials on students' creativity and learning motivation, a t-test with the formula (pooled variance) was used, this formula was used because the two samples were homogeneous.

$$\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1 + n_2 - 2} \left\{ \frac{1}{n_1} + \frac{1}{n_2} \right\}}} \quad (1)$$

The provision that if t count > t table then the hypothesis Ha is accepted and Ho is rejected and if t count < t table then the null hypothesis (Ho) is accepted and Ha is rejected. In this study, hypothesis testing using multivariate test. With the criteria of significance value of Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root less than 0.05 for the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. Chest analysis in this study using the help of the SPSS program. As for the result criteria, if t count is greater than t table, then the alternative hypothesis (Ha) is accepted

3. RESULT AND DISCUSSION

From the results of data analysis using the SPSS program. 16 the data obtained from the students' writing ability test results both in the control class and in the experimental class as shows Table 3.

Based on the Table 3. the average value of each indicator is obtained. The first indicator is related to systematics with an average value of 84.7, the second indicator with an average value of 79.7. The third indicator with an average value of 79.28 and

TABLE 3: Descriptive statistics of experimental class.

	N	Minimum	Maximum	Mean
	Statistic	Statistic	Statistic	Statistic
Systematical	35	70.00	95.00	84.7143
Idea	35	65.00	95.00	79.7143
Language Style	35	70.00	90.00	79.2857
The Interesting	35	70.00	95.00	82.8571
Valid N (listwise)	35			

for the last indicator is 82.85. The following is a description of the results for the control class.

TABLE 4: Descriptive Statistics control Class.

	N	Minimum	Maximum	Mean
	Statistic	Statistic	Statistic	Statistic
Systematical	35	65.00	90.00	77.8571
Ideas	35	60.00	85.00	73.0000
Language Style	35	60.00	85.00	74.5714
Interesting	35	60.00	90.00	72.4286
Valid N (listwise)	35			

Based on the Table 4. the average value of each indicator is obtained. The first indicator is related to systematics with an average value of 77.8 the second indicator with an average value of 73. The third indicator with an average value of 74.57 and for the last indicator is 72. Before testing the hypothesis, first test prerequisites are the normality test of the data and the homogeneity test. The following are the results of the normality test, both pretest and posttest, Table 5.

TABLE 5: Data Normality Test.

	EKS
Chi-Square	13.600 ^a
Df	8
Asymp. Sig.	.093

From the results of the analysis using the SPSS program, obtained a significant value of 0.093. Due to a significant value greater than 0.05, then the data is normally distributed. The following are the test results using the Kolmogorov-Smirnov in Table 6.

Table 6. shows a significant (2-tailed) value of Kolmogorov-Smirnov of 0.057, this value is also greater than 0.05 which means the data is normally distributed. Following are the results of the normality test of the final test data with a significant value of 0.621.

TABLE 6: One -sample Kolmogorov-Smirnov test pretest.

		Control class	Experiment
N		35	35
Normal Parameters ^a	Mean	.0000	63.3714
	Std. Deviation	.00000 ^c	3.43071
Most Extreme Differences	Absolute		.225
	Positive		.117
	Negative		-.225
Kolmogorov-Smirnov Z			1.333
Asymp. Sig. (2-tailed)			.057

This value is also greater than 0.05 which means the data is normally distributed. The following are the results of the homogeneity test in Table 7.

TABLE 7: Test of homogeneity of variances.

Levene Statistic	df1	df2	Sig.
.121	1	68	.729

The homogeneity test was then carried out from the initial test data. The following will present the results of the homogeneity test using Levene. The results of the homogeneity test obtained Levene’s value of 0.121 and a significant value of 0.729. Significant value greater than 0.05 which means both samples are homogeneous, Table 8.

TABLE 8: Group statistics.

	Kode	N	Mean	Std. Deviation	Std. Error Mean
Writing skills	1	35	81.2857	4.95611	.83774
	2	35	74.1429	4.25747	.71964

The average value of the final test in the experimental class (kode 1) obtained a score of 81, while the average value in the control class (kode 2) was 74. The following are the results of the t test using the SPSS program in Table 9.

Based on the test results, the t-count value was 6.486. This value when compared with t table is 0.68 at a significant level of 5% and df = 68. So, count is greater than t table (t Count > t table then the accepted hypothesis is the alternative hypothesis (H_a) which means there is an effect of using the method drill on the development of students’ scientific writing skills.

The results of the analysis show that the average value of each indicator for the experimental class is higher than the average for the control class. In the experimental class, the first indicator is related to systematics with an average value of 84.7. The first

TABLE 9: Independent samples test.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Writing skills	Equal variances assumed	.286	.594	6.468	68	.000	7.14286	1.10439	4.93907	9.34664
	Equal variances not assumed			6.468	66.488	.000	7.14286	1.10439	4.93816	9.34755

indicator is related to conformity with systematics. Students in writing scientific papers have followed the systematics that have been determined according to the material in the scientific paper writing course. The form of scientific work compiled by students is in the form of a mini research proposal with the general theme “The Implementation of Bima local wisdom in learning in schools”. The systematics generally contain an opening section, a content section and a closing section. The opening section consists of a cover page, an introduction, a table of contents, a list of tables (if any) and a list of pictures (if any). The core part starts from the Introduction which consists of the background, problem formulation and objectives. The core section also contains a discussion of theory, relevant research studies, frameworks and hypotheses (if any). then there are methods. Meanwhile, the closing section contains a bibliography and attachments (if any). The complete systematics is contained in the manual for writing scientific papers at STKIP Taman Siswa Bima.

The second indicator with an average value of 79.7. the second indicator is about the ideas/ideas as outlined in the writing from the results of student writing, it can be seen that the ideas written are in accordance with the theme raised. For the third indicator with an average value of 79.28 regarding the use of correct grammar. As a result, students read and check repeatedly related to the writing they wrote, so they can check which writing is less precise, both from sentence editors, writing punctuation marks and using standard language. The results of the written work become better in terms of the use of grammar. The last indicator is about the attractiveness of writing with an average value of 82.85. with the general theme raised related to the implementation of local wisdom in learning. Student’s scientific work has its own charm from each student. Some raised the title about the implementation of ethnomathematics in learning in elementary schools, the application of ethnoscience in science learning, the use of Uma Lengge teaching

aids in geometry learning and so on. In this case, students are able to compose scientific papers well.

Based on the Data being seen from the average value above, the value of the t test results, where t count is greater than t table, which means that the drill method can improve students' writing skills. The results of this study are in line with the results of previous studies. Students' learning to write scientific papers using the drill method are higher than students' learning achievements to write scientific papers using the tutorial method [14]. The drill method is an effective method in developing student skills, according to the theory of Thorndike, Pavlov, and Skinner that continuous practice and practice activities both individually and in groups can change individual behavior. Students who practice writing practice repeatedly can make students more creative, and can increase their ability to develop ideas and ideas through the sincere work they do. Other research results that are in line with the results of this study are the results of research showing that the drill method can improve writing skills with a mastery value of 60% in the first cycle, increasing to 80% in the second cycle and 92% in the third cycle [25]. The drill method is an effort to build continuous learning habits with the aim of training and guiding students to master the material being taught [27]. By applying the drill method in this research, students are able to develop writing skills, are able to write scientific papers according to the systematics, ideas and knowledge are contained in writing correctly and correctly according to each item in the systematics, able to use correct grammar, and able to write interesting. This student's writing ability can be developed through the drill method and honed continuously. Writing ability of each student can be developed seriously and honed continuously and cannot be obtained just like that [28].

4. CONCLUSION

Based on the results of research and data analysis, the results of the t-count value were 6.486. This value is compared with t table of 0.68 at a significant level of 5% and $df = 68$ and it is concluded that there is an effect of the use of the drill method on the development of students' scientific writing skills. Based on the results of this study, it is recommended to use the drill method in learning in order to train students continuously so that students become skilled and agile in solving the problems given. The limitations of this research are that it takes a long time in its implementation and must be careful in correcting scientific papers produced by students.

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