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Enhancing Student's Communication Skills in Writing Biology Practical Reports Using Flashcards

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Abstract

This study aimed to determine students' written communication skills in writing practicum reports using flashcards. The research was conducted on grade 11th high school students with a simple random sampling technique. The research method used was an experimental method with Posttest-Only Control Group Design. In the experimental group, students were instructed to use flashcards to write their practicum reports, while the control group used conventional methods, writing on paper as usual. Students were then asked about their experience with a questionnaire. Students' reports on flashcards were scored and analyzed. The results showed that using flashcards significantly improved students' written communication skills in writing practicum reports. This improvement was reflected in comparing post-test results between the experimental and control groups. In addition, students also responded positively to flashcards to improve their practicum report writing skills. The findings of this study contribute to the practical and theoretical understanding of effective teaching methods for writing, especially in the context of practicum reports. This study gives an insight into students' communication skills in writing that can be improved by applying innovative learning strategies.

Keywors: Flashcard, Written Communication, Laboratory Report

INTRODUCTION

The learning process is a learning activity through scientific work that involves various skills. Biology is one of the subjects that require science-based learning skills. These are called scientific process skills (Rauf et al., 2013). Scientific process skills include observing, classifying, interpreting data, making predictions, forming hypotheses, conducting experiments, and communicating different results by categorizing relevant factual information to test ideas and idea skills (Suja, 2021). The communication stage of scientific process skills is very helpful in developing students' communication skills. Wati et al. (2019) stated that the final stage of scientific process skills is communication, and to ensure students' level of understanding in communicating learning results, students need to communicate the results of the learning process. Communication skills are essential to convey messages, thoughts, emotions, imagination, and ideas (Rao et al., 2016).

Communication skills can be used to convey one's thoughts and feelings to others, either verbally or in writing (Gufron, 2016). Written communication skills can be expressed through text, graphics, or images. Written communication is the sending and receiving messages using written materials (Suja, 2021). Many studies report that Indonesian students' written communication skills still need to be improved. Widdina et al . (2013) stated that students' ability to change data presentation formats still needs to improve compared to other scientific

process skills. One of the causes of low communication skills is that students still need help explaining data from observations and experiments in graphs, tables, or diagrams (Widdina et al., 2013). Other research shows that written communication skills can help students think analytically by making good graphs (Matuk et al., 2019). In both studies, written communication skills are essential to improve conceptual understanding. In biology learning, students' written communication skills can be trained through writing practical reports.

Reporting is an essential communication skill because the Report contains a chronological element of work practices both in the field and the laboratory, which consists of systematic steps and must also be reported systematically. Therefore, a practicum report on the biology learning process must be presented systematically, coherently, and in detail (Slavin, 2018). In practicum activities, students' communication skills are expected to be trained so that they can convey the results of their practicum. A complete practicum report includes objectives, theoretical basis, tools and materials, experimental procedures, observation results, discussion, and conclusions (Dalman, 2014). Students can write practical reports using visual media in cards that contain images of symbols, such as flashcards. Flashcards are learning media in the form of picture cards that are the size of postcards and could be used by students to write practical reports (Wijayanti, 2015). The image conveyed on the card is a hand-drawn image or photo posted on the cards. Practical report writing can use flashcards with code. Barcoded flashcard media is a combination of flashcards and barcodes. Barcodes symbolize certain lines or codes as data storage (Meliawati, 2020).

Based on observations at one of senior high school in Tangerang, Indonesia, it is known that teachers could better evaluate students' written communication skills. A survey of 40 students showed that 100% felt that they had never written a practical report, while 100% felt that they had difficulty writing reports, such as the Report's structure or how to write it. Besides that, the questionnaire results showed that 100% of students never wrote a report during practicum. In contrast, 81.8% of students feel they need help preparing reports, like systematically structuring writing reports. Survey of This also impacts less measurable communication skills of students in a written way, which also includes understanding students from results practicum and skills students need to write a rein systematically.

When writing a practical report, steps should be taken to assess the student's written communication skills systematically. Therefore, when using flashcards to create practice reports, it is essential to analyze students' written communication skills to find out their written communication skills. The chosen practical activity focuses on plant tissue material. This is because students are curious about network forms through this internship. The researcher will analyze the communication skills of Class XI Science students at one of senior high school in

Tangerang, Indonesia. This aims to expand students' knowledge, provide writing experience, and improve students' written communication skills when making practical reports using flashcards.

METHOD

This study used quantitative methods with a post-test-only control group design following Mustamini (2015). Participants included 80 students in 11th grade at one of senior high school in Tangerang, Banten, Indonesia. The students comprised two classes of 40 students, namely X (experiment group) and C (control group). In the practical work of biology sub material tissue in plants, both groups did the practicum in the same way, namely observing the tissue in the leaves, roots, and stems of dicotyledonous and monocotyledonous plants using a microscope, then from the results of observations students were asked to take pictures of the observations for data that must be reported in writing after doing the practicum. In class X, students are asked to write their practicum reports using flashcards. Flashcards are made digitally with the help of Canva, and flashcard reports are compiled systematically according to the results of observations written according to the practicum report format. Flashcard reports are combined with report designs according to student creativity, starting from report layout, design, and fonts tailored to student creativity. Meanwhile, C-class students traditionally write their Reports, i.e., in the report book. After finishing their Report, students were asked some questions (interviewed) about their experience writing a report in such a manner.

Students' flashcards follow the concept of student creativity. After being tested/ asked to write a practical report on the Flashcard, students were given a questionnaire (consisting of 10 questions) to express their experience. Two experts in education and teaching assessed the instrument. The analysis technique for instrument test results used validity, Product Moment, and reliability.

This research collected data by assessing students' written communication skills in practicum reports and student response questionnaires. Hypothesis testing analysis techniques use the normality test Shapiro-Wilk, homogeneity test Levene, and statistical tests SPSS—assisted parametric *t-test*.

RESULTS AND DISCUSSION

Students' written communication skills will be assessed by writing a practicum report. Student communication skills in the experimental class reached 72.25, and the control class reached 63.5 (Figure 1). After calculations, the overall average value of students' written communication skills and sentence structure is determined.

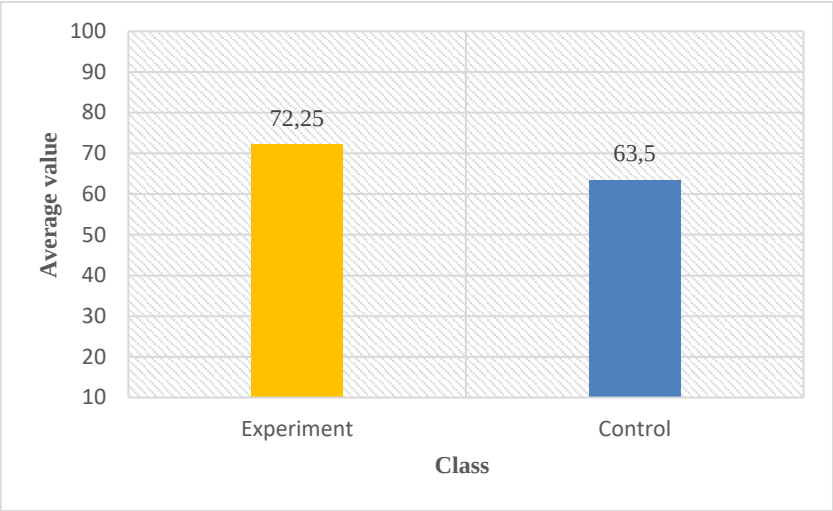


Figure 1. The Average Value of Written Communication skills

Class experiments are compared to class control when comparing the average ability value of communication written by students based on results from the practicum report. This difference occurs in innovation in the form of flashcards for writing down observation results. This is also a response to the innovation flashcards, which makes students more interested in writing reports and more focused and creative in writing observation results.

The Shapiro-Wilk test statistics used with the IBM SPSS Statistic 23 application to test whether the research data is usually distributed. The analysis results are in Table 1.

Table 1. Shapiro-Wilk Normality test result

Class	Statistic	Df	Sig. (2-tailed)	Decision
Experiment	0.954	40	0.104	Normal
Control	0.972	40	0.406	Normal

Based on the results of the analysis of the normality test calculation for the experimental class, the Asymp Sig (2-tailed) value = 0.104> 0.05, the data is said to be expected. This means the post-test data of students' written communication skills in writing practicum reports in the experimental class are normally distributed. While the control class has an Asymp Sig (2-tailed) value = 0.406> 0.05, the post-test data on students' written communication skills in writing practicum reports in the control class is usually distributed.

Furthermore, the data homogeneity test uses the Levene test with IBM SPSS Statistic 23; the calculation results are shown in Table 2.

Table 2. Levene Homogeneity result

Sig.	Decision
0.088	Homogeny

Based on the homogeneity test results, the Sig value = 0.088. Because the Sig value = 0.088> 0.05, the data is said to be homogeneous. After the data is declared homogeneous, the hypothesis test is continued using the independent samples T-test.

Table 3. Independent Samples Test Hypothesis test result

		F	Sig.	t	df	Sig. (2-tailed)	Upper
Skills	Equal variances assumed	2.979	.088	5.509	78	.000	16.50674
	Equal variances are not assumed.			5.509	71.998	.000	16.51250

Because the significant value (0.000) is smaller than alpha (0.05), then, the t-test results used assume equal variance, namely with a -t count value of 5.509 and a -t table value of -1.99085 (with df = 78 at two tail 0.05 obtained -t table of - 1.99085). Seeing the significant 0.000, which is smaller than alpha 0.05, and the value of -t count (-5.509) < t table (-1.99085), the decision taken is to reject H_0, which means that there is a difference in value between the Experimental Skills variable and the Control Skills. It can be interpreted that there is an effect of Flashcard innovation as a practicum report on students' written communication skills.

Flashcard innovation in writing practicum reports provides a fun new picture of writing a report. Flashcards have the advantage of providing a fun and exciting activity when writing reports for practice. Students can hone their brains by making reports in the form of flashcards. Creating visual media can also balance the performance of the right and left brain (Parnawi, 2019). Then, use visual media to help students express their creativity in writing. Visual media can influence students' writing skills by providing opportunities for students to maximize the learning process (Dewi et al., 2019). In addition, visual media in learning can also improve communication skills because it reveals the essence of the content presented with complete understanding, both orally and in writing (Kosim et al., 2021). Report writing through innovative practicum reports further develops students' knowledge and creativity, making biology learning interesting. Innovation flashcards with Canva offer many attractive templates for students to create practicum reports. Canva offers many features customized to your student's creativity, including our themes, elements, and fonts. Flashcards are a visual learning media that help students improve their memory ability. Flashcard media is supported by various engaging media so that you can get maximum results in its use (Rahman et al., 2021). Flashcards, which are practical and used in learning innovations such as visual media, are said to have long-term positive effects on learning.

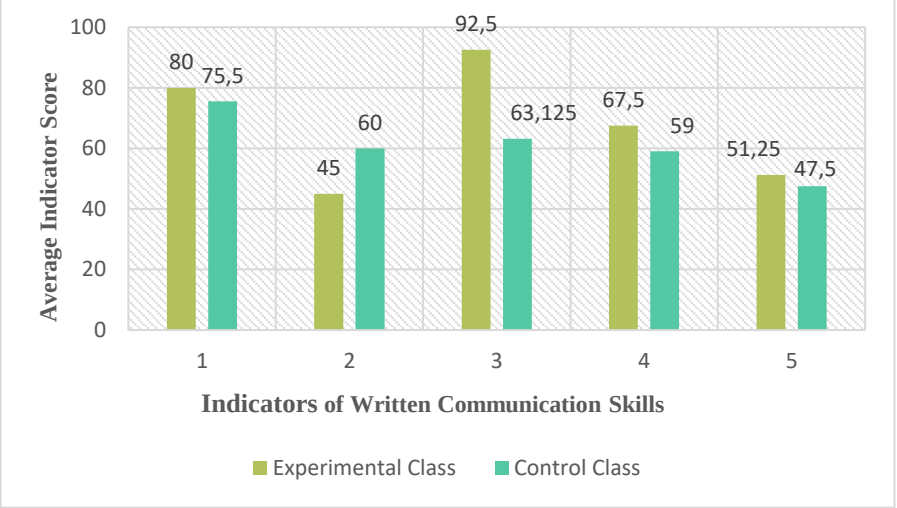
Figure 2. Practical Report using Flashcard

An essential part of report writing is the composition aspect. The organizational aspect of writing relates to the structure of writing and how information is delivered and presented in an organized and exciting manner. This study also examined aspects of reporting as supporting data. The result of the sentence structure assessment showed that the class experiment obtained a higher performance than the control class. The mean value of the reporting structure of the experiment and control class. Therefore, a high mean score for written communication skills is the same as the mean score for an equally competent structure in report writing.

Figure 3. Average Value of Writing Structure

The analysis shows that in the experimental class, most students can write all parts of the report structure systematically and contain indicators of written communication skills assessment. Students in the experiment class can process observation data into compelling and structured writing; students can also present interesting data with the help of report innovation in the form of flashcards as visual media. This matter shows the students' abilities and interests developed in writing observation reports according to the structure systematically and interestingly to read with the help of flashcard innovation. This matter is in line with the opinion of Siregar et al. (2023) that using media facilities can foster interest in writing and improve

students' language skills, especially in writing activities. In addition, students' high interest and ability to write is one measure of success in understanding learning (Purnami, 2021). When evaluating the average reporting structure of the control class, it was found that the score was lower than the experimental class. Most students in the control class still need to write some structural parts of the Report. This is because students usually write their reports in writing, so they are less interested in expressing the results thoroughly and clearly in their reports. Students are bored with writing reports according to the existing report structure, so they choose not to write part of the structure. This shows that students need more motivation to interpret observation data into valuable data. Consistent with Adan (2023), students experience learning difficulties because many students with low learning motivation appear uninterested, give up quickly, and do not focus on learning.



Information:
1: Describes an empirical picture in the form of a table
2: Read the table of observation results
3: Provide information on the observed images
4: Present the result of observations
5: Explain the result of observations

Figure 4. Average Value of Each Indicator of Written Communication Skills

The calculation and processing of data resulted in higher experimental class scores on four indicators. Meanwhile, there is one indicator that is superior to the control class. This is because the difference between the average values is influenced by the treatment given to one of the data groups. The graph in Figure 4.4 shows the value of each written communication indicator. The first indicator is describing empirical data in the form of tables. The overall assessment of the experimental class and control class is at a reasonable level. The experimental class assessment results are higher than the control class. This is because most experimental class students can present observations in several tables and understand the results contextually. This finding aligns with Hasinah's opinion (2022) that students who can present data in the form

of tables are considered to understand contextual data problems because students can solve them with their thoughts and language about what is known. However, a small number of experimental and control class students still need help to present data in tabular form; according to students at school, they have yet to be taught explicitly about data presentation, so they find it difficult to determine the correct type of table. Some of the factors that constrain students to write the most influential tables are teacher factors and inadequate facilities or media (Juwita, 2022).

The written communication skills of experimental and control class students are obtained by calculating and comparing each indicator that measures written communication skills, as shown in Figure 4. The second written communication skill indicator is reading the observation table. This indicator explains some concepts or primary material from the table made. The evaluation results of the experimental and control classes fall into the appropriate category, but when compared, the experimental class evaluation results are lower than the control class evaluation. This is because students in the experimental class needed help connecting the data in the table and explaining the concept from the literature. According to students, teachers should have specifically taught them to read or infer data from tables and graphs. This is in line with the opinion of Siswonto (2016) that one of the causes of students' poor table reading skills is that schoolteachers rarely teach students how to interpret tables and graphs. In addition, most students still need help reading tables, and most consider table explanations complicated. This is due to the limiting factors that influence inadequate equipment (inability to see/use media) and teacher factors (Setiani, 2021).

The third written communication skill indicator is providing information about the picture. The experimental class evaluation results were higher than the control class. In the experimental class, most students could provide complete and accurate information about the pictures obtained from their observations. In contrast, some students in the control class described the picture entirely, but many needed to be more accurate. The overall assessment of the experimental class was in the "outstanding" category, and the overall assessment of the control class was in the "good" category. This is because students in both biology and other subjects are used to being assigned to provide information about pictures. The habit of training students in answering and completing tasks will make it easier for them to complete the next similar task (Sudaningsih, 2020). Furthermore, according to Safitri et al. (2023), understanding specific problems, developing strategies, and being familiar with certain tasks will help you solve these problems.

The fourth indicator represents the description of the observation results, with the experimental class rated "good" and the control class rated "medium." This is because the

control class displays many pictures of the observation results that need better quality. In contrast, the experimental class presents the observation results as simple but high-quality images. This is in line with Rukajat's (2021) opinion that a good visual presentation should be simple to convey ideas clearly and easily without textual explanation. In this case, the images are not intended to build explanations but to emphasize context—specific main problems (Zulmiyetri et al., 2019). The last indicator explains the observation. The evaluation results of the experimental and control classes fell into the "sufficient" category. Most students had difficulty identifying observations. Students need to be able to identify and connect with essential content and dig deeper into more critical data. Students need help to explain the data.

The indicator explains the results of observations thoroughly. This is related to students' understanding of the concepts used to explain their observations. This finding is consistent with the findings of Nurlaelah et al. (2020), which state that to improve the ability to explain observations, students must improve their ability to understand concepts and connect the elements in them. In addition, abnormalities affect psychological factors such as logical thinking and the ability to think systematically and analyze problems realistically (Kartiani, 2019). The average value of written communication skills of experimental and control class students consists of several distinct levels, ranging from very good to abysmal levels.

CONCLUSION

Using flashcards as media to write practical reports improved students' communication skills in writing. Based on the evaluation results of written communication skills obtained from student practicum reports, the experimental class has an average score of 72.25, which is included in the excellent assessment level. In contrast, the control class obtained an average of 63.5, which is included in the sufficient assessment level. Responds to students' questions revealed that students feel more manageable writing their reports on flashcards and increase their creativity. This research gives insight into students' communication skills. Innovative learning, such as flashcards, could improve students' creativity and communication skills in writing.

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