



# LETTER WRITING AS AN ALTERNATIVE ASSESSMENT STRATEGY IN BIOLOGY

**Vilma Muega- Geronimo**<sup>1</sup>

<sup>1</sup>Associate Professor V,  
Laguna State Polytechnic University, Sta. Cruz  
Campus Sta. Cruz Laguna,  
Philippines

**Myralene A. Estrella**<sup>2</sup>

<sup>2</sup>Secondary School Teacher,  
Department of Education Philippines

## ABSTRACT

*This study explores letter writing as an alternative classroom assessment strategy in selected topics in Biology. Letter writing was used to determine if there is an enhancement in the students' performance in Biology compared to the traditional method of assessment during the face-to-face mode of learning. The study also aims to assess the respondents' perception of the benefits of letter writing. The respondents of the study were eighty (80) grade 10 students from two sections, heterogeneous classes. Mean, Standard Deviation, and t-test for dependent and independent samples were employed as a statistical treatment to answer the stated questions. The study reveals that the mean post-test score of the experimental group (letter writing) is statistically significantly higher than the traditional group's mean post-test score. This means that students who used letter writing enhanced their performance in Biology than in the traditional group. The result also reflects that aside from the students' better performance in selected topics in Biology, they could also acquire non-science outcomes. The implication is to use this technique as an alternative assessment strategy in other branches of Science and various delivery modes of learning.*

**KEYWORDS:** Letter Writing, alternative assessment, the traditional method, assessment strategy

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Highlights:

- Assessment is an integral part of education
- Letter writing is an essential activity that all students of Science need to gain a completely focused scientific understanding.
- Letter writing (Letters and persuasive writing) serves as the main ingredient in how students process Science and mathematics concepts.
- Learning can apply science skills and practices beyond the science disciplines

## INTRODUCTION

Assessment is an integral part of education, specifically the part in the classroom setting; it plays at least two critical roles in higher education, ensuring institutional quality and accountability, and the other, in improving student learning (Tunku B. et al.2014). It serves to bridge the gap between what is taught and what is learned (William D. 2013)

Assessment responds directly to concerns about better learning and more effective teaching (Cross, D. R.

2010). It is a measure of the learner's progress. Because classroom assessments are created, administered, and analyzed by teachers themselves, the likelihood that instructors will apply the results of the assessment to their teaching is greatly enhanced. Educators keep on searching for strategies and approaches as well as alternative assessment strategies that will suit the need of this generation. It is necessary that the teacher shift from the traditional to a more prevailing way of assessing students' performance. With the growing attention given to the students' academic performance, teachers are encouraged to find ways to help each student embrace the importance of education. These are the educators' challenges that teachers need to surpass each day.

The traditional assessment strategies do not necessarily measure other students' skills, nor could they measure a full knowledge of the topic discussed, especially in a science subject. One of the characteristics described in Science education for sustainability is that the teaching approach should be interdisciplinary. In this way, learning can apply science skills and practices beyond the science disciplines (Zoller, U. 2012).



Even when lab investigations are included in the instructional plan that requires higher-order thinking skills, the measure of student learning is often limited to recalling factual information, restating a definition, or applying a mathematical formula and problem-solving (Hammerman E. 2009). In a Science classroom, there are so many skills that can be observed and can be used as an assessment, just by merely observing what students write, say, and do can be a form of assessing performance (Agaton P. Jr., 2016).

One suggested strategy in learning Science is letter writing which is most commonly used as an assessment strategy in language courses. Writing is considered one assessment strategy that can increase students' performance because it is assessed for recall and more conceptual understanding (Hohenshell M.L.2008). Strong writing skills may enhance students' chances for success because they are needed to accomplish their educational and employable requirements (Rao and Durga 2018).

Writing is one of the modes of doing Science, from hands-on laboratory work to internet research, reading, and oral discourse. It is an essential activity that all students of Science need to gain a completely focused scientific understanding (Wallace, C. & et.al. 2004).. Letter writing (Letters and persuasive writing) serves as the main ingredient in how students process Science and mathematics concepts. It is also an important component in understanding the relationship between science and society because it offers students opportunities to demonstrate their abilities to apply and communicate concepts, they have learned in Science units (Barber et al. 1995).

The main purpose of Science education is to build students' knowledge of scientific content and scientific thinking skills. Therefore, good reading, writing, and communication skills are indispensable to the practice of Science. And these skills can be measured through an effective assessment's strategy related to writing, reading, or other communication skills (National Research Council, 1999).

Several studies have been conducted on the use of letter writing strategy, one of which is about preservice teachers paired as pen pals with fourth graders. This was their project in language and literacy course. It was found out that this activity brought a modeling of good writing and motivational value of responding in a positive, affirming voice to young writers (Moore,R & Seeger V. 2009)

Likewise, in a study conducted in an English subject, journal writing was utilized to assess the students' understanding of themes and main characters; students believed that the writing made them think more deeply about the story (Wong B., Trevor., J & Shimmer.,

H. 2010). Letter writing was also used to develop the ability to designed effective tasks in terms of gaining high levels of cognitive activity from students. The study affirms the potential value of letter-writing projects while introducing a concern that has implications for all professional development projects (Norton, A., Kastberg, S. 2012). It was also concluded that letter writing found out to be enjoyable for the students (Gambel T. 2008)., and perceive it one of the important components in science learning (Vaughan P. & Hand B.1999).

In this study, letter writing as an alternative classroom assessment strategy was used to determine its effectiveness in the student's full comprehension of the lesson.

### OBJECTIVES OF THE STUDY

- (1) Assess the level of performance of two groups of respondents in terms of;
  - (a) pre-test
  - (b) post-test
- (2) Determine the significant difference in the level of performance between two groups of respondents in terms of;
  - (a) pre-test
  - (b) post-test
- (3) Determine the level of benefits of using letter writing as an assessment strategy in biology

### METHODOLOGY

The researcher focuses only on Grade 10 students with two sections. Eighty students were the respondents of this study. All the said students were used to comparing the outcome of students' performance using letter writing compared to the result in the traditional method using the objective type of test in terms of pre-test and post-test.

Respondents are chosen using quota sampling, wherein the three sections from grade 10 students are written in the paper. These papers are placed in the box. The researcher picked two papers from the box, one was the control group, and the other one was the experimental group. Since each section contains 43-45 students, each name of the students was written in a piece of paper, and the required number of sample unit was picked.

This study is experimental research utilizing a quasi-experimental design wherein the researcher allows to control the assignment to the treatment condition, the respondents are purposely chosen from the group. The research instrument used in gathering primary data is the teacher-made test for the pre-test and post-test from the third grading period in biology, covering the lessons about the three Body systems:



nervous system, endocrine system, and reproductive system.

The reliability of the individual item in self-perceived benefits of the students in letter writing was determined by Cronbach Alpha which obtained a 0.8 reliability value. The pilot testing was done from ten students from the other sections handled by the researcher who was not subjected to the study but could experience the use of letter writing in their assessment answered the survey questionnaire. The researcher used the scoring rubrics to grade the student's letter.

The Mean and Standard Deviation (SD) was used to compare the pre-test and post-test mean results

of the control and experimental group. The t-test was used to determine if letter writing has significantly affected the performance of the grade 10 students. This test compares the mean of two samples.

### RESULTS AND DISCUSSION

The results concerning the use of letter writing as an alternative assessment strategy have been analyzed quantitatively. The presentation of findings followed the order of the questions enumerated in the statement of the problem.

**Table 1. Mean Scores in Pretest and Posttest of the Control and Experimental Group**

Group	Pre-test			Post-test		
	Mean	SD	Remarks	Mean	SD	Remarks
Experimental	15.30	4.45	Fairly Satisfactory	31.45	6.23	VS
Control	15.45	3.48	Fairly Satisfactory	23.05	5.77	VS

Legend:

41.00 - 50.00 - Excellent (E)

31.00 - 40.99 - Very Satisfactory (VS)

21.00 - 30.99 - Satisfactory (S)

11.00 - 20.99 - Fairly Satisfactory (FS)

0.00 - 10.99 - Poor (P)

The pre-test result of the control (M=15.45) and (SD= 3.48) and experimental groups (M= 15.30) and (SD= 4.45) were both interpreted as "fairly satisfactory." The control and experimental group's performance in the pre-test may be fairly satisfactory because of the students' poor background knowledge about the topics. Students were not able to recall the topic about organ systems when they were in elementary.

The post-test result of the control group (M= 23.05) and (SD = 5.77) was interpreted as "satisfactory". On the other hand, the experimental groups (M= 31.45) and (SD=6.23) were interpreted as "very satisfactory".

The result showed that both groups' post-test mean scores were much higher than the pre-test mean scores, which indicated that learning took place

regardless of the assessment used. However, the table revealed that the post-test of the experimental group is higher than the control group. This implies students' performance was enhanced with the use of letter writing. Preferably students enjoyed writing activity as part of the assessment process.

Table 2 presents the mean post-test score in the control group (traditional) is (M= 23.05) with (SD= 5.77) and is statistically significantly higher than its mean pre-test score of (M=15.45) with an (SD=3.48), and it was interpreted as significant. This established that the traditional group also improved. The students also learned in the discussion about the topics in the organ system.



**Table 2. Difference between the Pretest and Posttest scores of the Experimental and Control Group**

Control Group						
Test	Mean	SD	Mean Diff	T	P	Remarks
Pre-test	15.45	3.48	-7.60	-8.70	<0.001	Significant
Post-test	23.05	5.77				
Experimental Group						
Test	Mean	SD	Mean Diff	T	P	Remarks
Pre-test	15.3	4.45	-	-	<.001	Significant
Post-test	31.45	6.23	16.15	14.47		

The mean post-test score in the experimental group (letter writing) is (M=31.45) with an (SD= 6.23) is statistically significantly higher than its mean pre-test score of (M=15.30) with a (SD= 4.45) and it is interpreted as significant. This implies that the letter-

writing group improved their performance in biology and enhanced their letter-writing skills. This finding agreed with the other research results that respondents tend to recall the topics well when they write, and it can increase students' performance [7]

**Table 3. Difference in the Performance between two Assessment Methods**

Pretest						
Group	Mean	SD	Diff	T	P	Remarks
Experimental	15.30	4.45	-0.15	-	0.17	0.867
Control	15.45	3.48				
Posttest						
Group	Mean	SD	Diff	T	P	Remarks
Experimental	31.45	6.23	8.4	6.26	<.001	Significant
Control	23.05	5.57				

Based on the data, both groups have the same level of knowledge in Biology, covering the lessons about the three Body systems: the nervous system, endocrine system, and reproductive system. In terms of the post-test score of the letter-writing group (M=31.45) with an (SD= 6.23) which is statistically higher than the mean post-test score of the traditional group in which the (M= 23.05) and (SD= 5.77) and it was interpreted as "Significant." This implies that the experimental group's letter-writing method was more effective since the respondents' performance was higher than another group. In this case, the decision is to reject the null hypothesis.

In this study, the use of the traditional method and letter writing as a form of assessment affects the students' performance because both groups have surprisingly affected their post-test results. However, the

effects of letter writing as an alternative assessment strategy in biology are much higher than that of the traditional method. It only shows that letter writing is more effective than the traditional one. It established that students in the experimental group learned better than the traditional group students at the end of the experiment.

**Benefits on the Use of Letter Writing**

The level of self-perceived benefits of the students on the use of letter writing as a classroom assessment strategy in biology is "high" (M= 4.14) and (SD= 0.42), which means students perceive that letter writing to be highly acceptable. Based on the indicative statements, students have a clear idea and develop handwriting skills in letter writing.



**Table 4: Item on Benefits of Letter Writing**

Indicative Statement	M	SD	Remarks
As a student, I ...			
am now confident about my ability to write.	4.13	0.72	Agree
enjoyed writing a letter.	4.13	0.82	Agree
learned to write effective and precise sentences and paragraphs.	4.13	0.69	Agree
enhanced and widened my vocabulary skill.	4.08	0.83	Agree
have now a clear idea of the benefits of letter writing.	4.23	0.73	Strongly Agree
was able to remember the information well whenever I write.	4.18	0.64	Agree
was able to learn more Science concepts and their application in real life.	4.13	0.76	Agree
was able to organize properly different scientific ideas and concepts.	4.08	0.62	Agree
was able to improve my communicative competence.	4.10	0.78	Agree
was able to develop my handwriting skill or penmanship.	4.30	0.66	Strongly Agree
<b>Overall</b>	<b>4.14</b>	<b>0.42</b>	<b>High</b>

This implies that with the letter-writing method, students developed confidence about their ability to write, enjoyed writing letters, and learned to write compelling and precise sentences and paragraphs. They were able to remember information and learned more science concepts and their application in real life.

The results are inconsonant with the findings of several researches (Barber et al. 1995 & Gambel T. 2008), which conclude that writing was enjoyable and shows appreciation of letter writing benefits. Some students believe their essays were better organized, more fluent, and clearer than their oral articulation. In other words, they were more comfortable presenting their thoughts in writing than speaking in class.

## CONCLUSION

The hypothesis stated that there is no significant difference in the students' performance in letter writing as an alternative classroom assessment strategy was rejected. The experimental group's level of performance in the post-test was statistically significantly higher than the level of performance of the

control group in the same list. This means that letter writing as an alternative assessment strategy in Biology is more effective than the traditional assessment process.

The result also reflects that aside from the students' better performance in selected topics in biology, they could also acquire non-Science outcomes. In as much as the study proved the use of letter writing could enhance the students' performance in biology, science teachers are advised to consider the use of letter writing as an alternative assessment strategy in Biology and another branch of Science.

Since our country is under a pandemic, educational institutions need various strategies to support other learning delivery models such as synchronous, asynchronous, blended, and modular. In this sense, it is suggested that researchers may conduct follow-up studies on the effectiveness of this strategy in other modes of learning delivery.

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