

Scientific Writing

CLEC 2017
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Objectives

1. To describe the design of our multi-level approach in an effort to integrate scientific writing across the curriculum
2. To illustrate how the initial writing workshop was implemented and the utilization of the department's library liaison as a resource to enhance future implementations of the process
3. To describe the types of assessments that will be utilized in an effort to determine the effectiveness of this approach

The Problem

- Junior Year: Fall Semester Immunology Lab
- Students are required to write three formal laboratory reports.
- Lots of issues with writing skills and critical analysis

Proposed
Sophomore level
writing to
enhance
application skills?

MLS 116
(Intro to MLS)
Correlation of
Results + Diagnosis

MLS 122
(Genetics)
Mechanism of
Action

MLS 326
(Immunology)
Application of all
writing instruction

Plagiarism
Workshop

Writing Requirements

- Introduction: Provide a reasonably knowledgeable reader with the background needed to understand the experiment(s) presented.
- Specimen Requirement: States what type of specimen needs to be collected to perform the test as well as what portion of the specimen.
- Methodology: Describe the test as well as the scientific mechanism of action. We are not looking for a step by step recipe!
- Data and Result: (No interpretation in this section).

Writing Requirements

- Discussion:
 - Clear, concise summary of the major finding
 - Evaluation of quality control
 - Discussion of any experimental error
 - Correlates your results with the patient diagnosis
 - Interpretation of the clinical significance of the results

Writing Requirements

- Literature Cited: International Committee of Medical Journal Editors (ICMJE) format.
- One (1) reference must be from primary literature (i.e., research articles appearing in peer reviewed journals). The remaining two (2) references may be from book chapters and review articles.

Obstacles

- Explaining mechanism of action
- Integrating cited works
- Format of scientific writing
- Clinical significance and correlation of results
- → Advent of the scientific writing workshop freshman year.

Student Writing Examples

- Outright plagiarism in student writing:
- Monoclonal cold agglutinins were described in the 1950s in patients with chronic immune hemolytic anemia and thus were the first M-proteins shown to have antibody activity
- Stone MJ. Heating up cold agglutinins. *Blood*. 2010 Oct 28; 116(17): 3119-3120.
- Monoclonal CA were described in the 1950s in patients with chronic immune hemolytic anemia and thus were the first M-proteins shown to have antibody activity.

Student Writing Examples

- (Junior Level Introduction)
- The autoantibody IgM has an Anti-I specificity for the I antigen on the surface of red blood cell. ⁴The IgM will be attached to the I antigen on the cell membrane of red blood cells and caused the red blood cells to lyse and release hemoglobin. ⁴When the body is not able to keep up with the destruction of red blood cells to the production of red blood cells from the bone marrow (which will reduce the O₂ carrying capacity) it results in anemia.

Student Writing Examples

- (Junior Level Methods)
- After we added a drop of the 3-5% prepared Group O red blood cells to our tubes, we had to carefully shake the test tube rack to ensure that the content are well mixed. Then we incubated our test tube rack in the refrigerator at 4 Celsius for half an hour. The cold temperature will allow the cold antibodies to react and to adhere better.

Our Solution

- As a result of poor student performance at the junior level we have implemented a scientific writing workshop in freshman genetics lab.
- Goals:
- Educate students about what plagiarism is.
- Expose students to citing work in order to reduce future errors .
- Improve understand of mechanisms of action.
- Help students use published scientific works to support their writing.

Our Solution

- Case Report: Severe Hemolytic Disease of the Newborn in a Group B African American Infant Delivered by A Group O Mother
- 2. Using correct scientific writing format, synthesize a well-developed 6-8 sentence paragraph that addresses the following:
 - Students must demonstrate an understanding of the content expressed in their own words.
 - Correlate the mechanism of action of HDFN in relation to mother and infant's ABO blood group types.
 - Incorporate pertinent information from the journal article to support your discussion.
- 3. Accurately cite appropriate information from the journal article in your paragraph (using ICMJE in text citation format).
- 4. Accurately document all references on a separate page titled, Literature Cited (ICMJE format)

Evaluation

Category	Point Value
Paragraph Length (6-8 Sentences)	1
Written in student's own words	1
Correlation of mechanism of action of HDFN to ABO blood group system	2
Incorporation of journal article (Appropriateness and accuracy of supporting information)	2
In text citations (appropriate use and correct format)	2
Literature cited (correct reference format)	2
Total	10

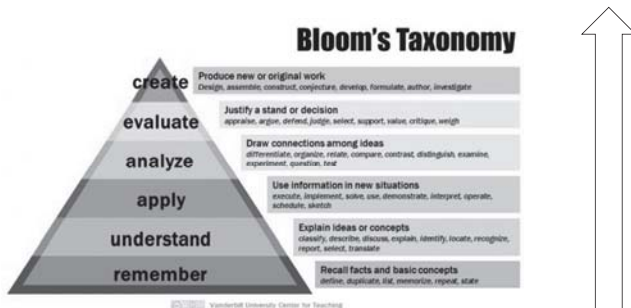
Evaluation

- Students who have earned a minimum of 70% on the writing assignment meet the standard. (Using the provided rubric)
- Revisions to the rubric/evaluation project may change in the future
- We consider >85% as exceeding the standard
- <70% is below standard

YOY progress

- We will compile data for students each year and compare student grades from previous years.
- The goal of this exercise is to evaluate our own teaching quality.
- We will be vigilant about tracking other variables that might impact student performance as well....
- Snow days, student population, changes in faculty....etc...

Tracking Growth



Tracking Growth

- Our overall goal is mastering writing in regards to Bloom's taxonomy.
- By the time the students reach senior year, they must complete a case study capstone project.
- Requires higher level thinking because data is collected from multiple labs.

Tracking Growth (Future Plans)

- We would like to assign numerical values to various levels of achievement.
- The higher the level of thinking, the higher the value.
- This would allow us interpret growth data on a larger scale.