

## **Assessment Plan: GELOs in Biology Courses**

### **PLNU General Education lab courses (BIO 101, 103, 105, 130, 210 & 211)**

**Learning Outcome:** GELO 1d. Critical Thinking: Students will be able to examine, critique and synthesize information in order to arrive at reasoned conclusions. This outcome will be measured yearly via direct, summative assessment.

#### **Outcome Measure:**

- 1) BIO 101, 103, 105, 210, 211 Signature Assignment: Multiple choice questions on the final exam taken from the Test of Scientific Literacy Skills (TOSLS). The whole class was assessed.
- 2) BIO 130 Signature Assignment: Motor unit lab activity. Students were chosen randomly by the administration.

#### **Criteria for Success:**

- 1) For BIO101, 103, 105, 210, and 211, at least 60% of the students will answer the questions correctly (an average of 60% for all of the questions). 60% was chosen since these are all introductory courses. BIO210 and BIO211 are freshmen courses for all Biology Department majors and also service courses for Allied Health majors. BIO101, 103, and 105 are General Biology courses for all other majors. Questions from the TOSLS were chosen that specifically addressed critical thinking and were appropriate for the content of each course.
- 2) For BIO130, at least 70% of the students will score at an average of level 2 or higher on the AACU critical thinking rubric. Level 2 was chosen because this course is the introductory Anatomy & Physiology course for pre-nursing students and Allied Health majors.

### Longitudinal Data:

Class	SPRING, 2017		FALL, 2016		
	n	% of Students Answering TOSLS Questions Correctly (Ave + S.D.)	n	% of Students Answering TOSLS Questions Correctly (Ave + S.D.)	% of Students Scoring at Level 2 or Higher on AACU Rubric
BIO101	34	72 $\pm$ 12	45	73 $\pm$ 15	NA
BIO103	48	71 $\pm$ 12	48	73 $\pm$ 14	NA
BIO105	NA	Not assessed	47	75 $\pm$ 16	NA
BIO130	NA	Not offered	51	NA	71%
BIO210	79	69 $\pm$ 16	98	80 $\pm$ 16	NA
BIO211	65	83 $\pm$ 5	44	75 $\pm$ 10	NA

**Conclusions Drawn from Data:** The students in the various GE laboratory courses are meeting the criteria for critical thinking.

**Changes to be Made Based on Data:** This is the first year we have used questions from the TOSLS exam, and we are quite pleased with the outcome. We will continue to use these questions for summative assessment in our GE courses.

### Rubric:

- 1) Gormally, C., Brickman, P., and Lutz, M. "Developing a Test of Scientific Literacy Skills (TOSLS): Measuring Undergraduates' Evaluation of Scientific Information and Arguments." C.B. E. Life Science Education 11(4): 364–377 (2012).  
BIO101: Questions 1, 4, 6, 7, 8, 11, 13, 14, 18, 28  
BIO103: Questions 4, 6, 7, 8, 11, 13, 14, 18, 28  
BIO105: Questions 2, 6, 18, 28  
BIO210: Questions 1, 2, 7, 8, 11, 19, 24, 25  
BIO211: Questions 2, 6, 18, 28
- 2) BIO130: AACU Critical Thinking Rubric, Row 5.