

LIBERAL ARTS: BIOLOGY

SPRING 2010

OUTCOMES ASSESSED:

- LO 1.1: Research existing information and data regarding a topic of inquiry
- LO 1.2: Evaluate data relevant to a topic of inquiry both quantitatively and qualitatively
- LO 1.3: Develop an appropriate hypothesis or thesis by applying logical, scientific or quantitative reasoning
- LO 2.5: Produce clear and well organized writing that responds appropriately to an assignment using Standard American English
- LO 2.7: Demonstrate fluency in the language of the discipline
- LO 3.8: Use appropriate software to produce written reports and to develop classroom presentations
- LO 3.9: Apply the technology of the internet, the Web, and online databases to research biological topics and evaluate the material retrieved being mindful of ethical, legal, and security issues

SUMMARY REPORT

Liberal Arts Biology Program

Outcomes Assessment: Spring 2010

Summary Report

Prepared by: Kenneth Thomas, Natural Sciences Department Chair

Learning Outcomes Assessed

Seven learning outcomes were assessed using 9 criteria:

- 1.1 Research existing information and data regarding a topic of inquiry
- 1.2 Evaluate data relevant to a topic of inquiry both quantitatively and qualitatively
- 1.3 Develop an appropriate hypothesis or thesis by applying logical, scientific or quantitative reasoning
- 2.5 Produce clear and well organized writing that responds appropriately to an assignment using standard American English
- 2.7 Demonstrate fluency in the language of the discipline
- 3.8 Use appropriate software to produce written reports and to develop classroom presentations
- 3.9 Apply the technology of the Internet, the Web, and online databases to research biological topics and evaluate the material retrieved being mindful of ethical, legal, and security issues

Product Evaluated

The products evaluated were laboratory reports assessed using a rubric developed in association with Ellen Wentland, Assistant Dean of Assessment, collected from LA: Biology students enrolled in BIO 111/BIO 112, in the Fall 2009, Spring 2010 semesters.

Process Followed

Liberal Arts: Biology majors enrolled in BIO 111 or BIO 112 were assigned laboratory reports which were collected and analyzed by four faculty members in the biological sciences. Faculty members were initially asked to include the following statement in their BIO 111/112 syllabi, informing students of this assessment activity:

"Northern Essex Community College's commitment to student success involves the evaluation of student work to help ensure that students are achieving the learning outcomes targeted by our programs. This process may involve the collection of student classroom products for evaluation at the program or department levels. When collected for this purpose, students' names will be removed from the products so that the assessing is done anonymously. Evaluations carried out at the program or department levels will not impact students' course grades. The process of assigning grades will continue to be the responsibility of the course instructor."

Analysis

A total of 13 students' Lab Reports from BIO 111 and five Lab Reports from students in BIO 112 were analyzed using the designated rubric. The percentage of students who received a score of 2 or higher, was determined for nine criteria, based upon a scale from 0-3. The results are tabulated below:

Criterion	BIO 111 % Rated #2 or #3	BIO 112 % Rated # 2 or # 3	Combined BIO 111/ 112 % Rated # 2 or # 3
A. Research existing information	8 %	60 %	22 %
B. Descriptions of identified research	15 %	40 %	22 %
C. Referencing of researched information	31 %	100 %	50 %
D. Evaluation of collected data	46 %	80 %	56 %
E. Hypothesis(es) presentation	15 %	40 %	22 %
F. Written communication	85 %	100 %	89 %
G. Fluency in language of the discipline	77 %	80 %	78 %
H. Appropriate software usage	100 %	80 %	94 %
I. Application of technologically based databases	8 %	100 %	33 %

Discussion of Results

Assessment of lab reports demonstrates that NECC Liberal Arts: Biology students excelled in the Written Communication, Fluency in Language of the Discipline, Appropriate Software Usage.

Lab report assessments demonstrate that NECC Liberal Arts: Biology students received low scores with the following areas: Research Existing Information, Descriptions of Identified Research, Hypothesis Presentation. This is thought to be an artifact of Descriptive vs. Experimental style lab exercise rather than reflect underperformance in these areas. Some reports were based on experimental type labs, while others were based on observations. Using only 'experimental' type lab reports may help to determine if measured differences between criteria are *real* or *artifacts* of the sampling method. Furthermore, in 8 out of 9 categories, students in BIO 112 scored higher than students in BIO 111.

Conclusion and Action Plan

At the conclusion of the 2009 - 2010 academic year the following conclusions were surmised. Future data collection should occur for further analysis from BIO 111 & 112. Larger sample sizes would enable more valid comparison of students in BIO 111 to those in BIO 112. If lab reports are continued to be used as an assessment tool, then standardize types of lab reports need to be collected to determine if the categorical differences observed (refer to A, B, E vs. F, G, H) are real or an artifact. Currently discussion is underway to determine if a set of standard questions should be developed and used as a supplement to, or replacement for laboratory reports as an assessment tool for Liberal Arts: Biology students at NECC. Conversation with new and existing full time faculty members in the department, who are primarily responsible for BIO 111/112 will continue with Ellen Wentland, Assistant Dean of Assessment.

RUBRIC

AY 2009-10

Student name _____

BIO 111/112 Lab Report Assessment Rubric

Rating Criteria	Rating Standards			Rating
	0	1	2	
Research existing information	No research presented	1 or 2 weak references	1 or 2 strong references /research sources identified	More than 2 strong references/research sources identified
Descriptions of identified research	No research presented	Identified research inadequately and/or inaccurately described	Identified research mostly adequately and accurately described.	Identified research completely and accurately described.
Referencing of researched information	No references provided	References inaccurately cited	References cited using currently accepted journal standards, but with some inaccuracies	References accurately cited using currently accepted journal standards
Evaluation of data	No data interpretation	Data poorly interpreted.	Data interpreted partially, though in an incomplete manner	Data clearly presented and evaluated in a meaningful way
Hypothesis presentation	No hypothesis presented	Poorly developed hypotheses, circular or other faulty reasoning present	Reasonable hypotheses are clearly presented adequately but have one or more minor flaws	Hypotheses generated in a sound, scientifically acceptable manner
Written communication	Document is poorly written and nearly incomprehensible	Writing is difficult to follow, incomplete sentences may be present	Writing is somewhat understandable but is presented in a poorly organized manner	Writing is clear, concise and understandable, as well as relevant and timely
Fluency in	Language of the	Some language	Many aspects of the	Language of the

language of the discipline	discipline is ignored	aspects of the discipline are present but are grossly misused.	language of the discipline are present, though sometimes are used inappropriately	discipline is used as intended in an appropriate manner
Appropriate software usage	Lab report is handwritten or presentation not performed using appropriate software	Presentation is poorly executed, obvious lack of software knowledge such as hand drawn graphs, tables, etc.	Presentation is generally well executed although some apparent flaw in software knowledge is present	All presentation guidelines followed, software expertise demonstrated
Application of technologically based Internet, Web, or online databases	No evidence to indicate use of Internet, Web or online databases	Evidence exists that demonstrates the poor use of Internet, Web or other online databases	Good, though imperfect use of Internet, Web or other online databases	Evidence provided of Internet, Web or other online databases use in an appropriate manner that strongly supports the document

RESULTS

April 8, 2010

STUDENTS IN BIO112 CLASS(ES)

LAB REPORT ASSESSMENT RESULTS

Total number of students evaluated = 5

RATING CRITERIA FROM THE RUBRIC USED	NUMBER RATED....						
	0	1	2	3	Total # of ratings	# rated 2 or higher	% rated 2 or higher
Research existing information	--	2	2	1	5	3	60.0%
Descriptions of identified research	--	3	2	--	5	2	40.0%
Referencing of researched information	--	--	1	4	5	5	100.0%
Evaluation of collected data	1	--	3	1	5	4	80.0%
Hypothesis(es) presentation	2	1	2	--	5	2	40.0%
Written communication	--	--	3	2	5	5	100.0%
Fluency in language of the discipline	--	1	2	2	5	4	80.0%
Appropriate software usage	--	1	1	3	5	4	80.0%
Application of technologically based Internet, Web, or online databases	--	--	5	--	5	5	100.0%

STUDENTS IN BIO111 CLASS(ES)

LAB REPORT ASSESSMENT RESULTS

Total number of students evaluated = 13

RATING CRITERIA FROM THE RUBRIC USED	NUMBER RATED....						
	0	1	2	3	Total # of ratings	# rated 2 or higher	% rated 2 or higher
Research existing information	9	3	1	--	13	1	7.7%
Descriptions of identified research	8	3	2	--	13	2	15.4%
Referencing of researched information	6	3	3	1	13	4	30.8%
Evaluation of collected data	--	7	4	2	13	6	46.2%
Hypothesis(es) presentation	5	6	1	1	13	2	15.4%
Written communication	--	2	9	2	13	11	84.6%
Fluency in language of the discipline	--	3	9	1	13	10	76.9%
Appropriate software usage	--	--	4	9	13	13	100.0%
Application of technologically based Internet, Web, or online databases	8	4	1	--	13	1	7.7%

STUDENTS IN BIO111/112 COMBINED

LAB REPORT ASSESSMENT RESULTS

Total number of students evaluated = 18

RATING CRITERIA FROM THE RUBRIC USED	NUMBER RATED....						
	0	1	2	3	Total # of ratings	# rated 2 or higher	% rated 2 or higher
Research existing information	9	5	3	1	18	4	22.2%
Descriptions of identified research	8	6	4	--	18	4	22.2%
Referencing of researched information	6	3	4	5	18	9	50.0%
Evaluation of collected data	1	7	7	3	18	10	55.6%
Hypothesis(es) presentation	7	7	3	1	18	4	22.2%
Written communication	--	2	12	4	18	16	88.9%
Fluency in language of the discipline	--	4	11	3	18	14	77.8%
Appropriate software usage	--	1	5	12	18	17	94.4%
Application of technologically based Internet, Web, or online databases	8	4	6	--	18	6	33.3%