Annual Assessment Report

Biology Education

Faculty Responsible for the Report

Annual Assessment Report

Program Profile

	2013-2014	2014-2015
Majors (total, majors 1,2,3)	4	4
Minors	N/A	N/A
Concentrations (Add Rows if needed)	N/A	N/A
Full Time Faculty	Vern Hart, Robin Hirsch-Jacobson, Kimberly Keller, Nicholas A. Pullen, Vern Hart, Education Faculty??	Vern Hart, Robin Hirsch-Jacobson, Kimberly Keller, Nicholas A. Pullen, Vern Hart, Education Faculty??
Part Time Faculty	??	??

Commented [PN1]: One student dropped this major another student plans to drop but has yet to file paperwork. Both were assessed as Bio. B.A.

Combine all major students. If your discipline has a **secondary education certification component**, you will need to indicate that in the title of this report unless you are submitting a separate report for the education component.

*If your discipline is a major with **one or multiple concentrations**, that information needs to be included as separate content. Report the number of declared students by concentration and each concentration will need a separate assessment section.

Program Delivery (HLC 3A3)

Traditional on-campus _____X____

Online Program _____

Evening Cohort _____

Analysis:

Program goals for student retention, persistence and degree completion are? Consider the students' "time to degree." Does the actual time to degree fit and reflect the program's expected and advertised time? If not, are there ways to align the two?

The biology faculty do not have adequate access to student data (specifically education coursework), external agency requirements, or institutional planning & guidance to make this assessment.

Outside Accreditation:

Is your program accredited by outside accreditor? If "yes", name the accrediting agency and include the cycle for accreditation review. *We do no know. (DESE?)*

Is accreditation available for your program? *We do no know. (DESE?)*

Are you making strides to attain accreditation? If no, why not?

Program Action Items

Action Item 1:	Assess the viability of the B.S. Biology Education major.
Action steps:	Meet with faculty in the Education department, the Biology department, relevant Division chairs, the Dean of Assessment, and the Academic Dean to determine whether this major should continue to be offered.
Timeline	December 2014
Faculty Responsible	Kimberly Keller, Nicholas Pullen, Robin Hirsch-Jacobson
Evaluation	By the end of the Fall 2014 semester, come to a decision on whether this program is in the best interest of current and future students. *The biology faculty do not support the continuation of this program as a biology degree.*

Action Item 2:	To fully and clearly establish the role of the faculty in Education, Math and Sciences (includes the faculty teaching Biology, Chemistry, Physics, and Science courses) in the collection of data and the future writing of such assessment plans and reports.
Action steps:	Meet with faculty in the Education department, the Biology department, relevant Division chairs, the Dean of Assessment, and the Academic Dean to determine who is responsible for this program and its various components, especially the role of assessments and reports. Pending Action 1 outcome.
Timeline	April 2015

Faculty Responsible	Kimberly Keller, Nicholas Pullen, Robin Hirsch-Jacobson
Evaluation	By the end of April 2015, there is a clear, written understanding of who is writing the reports/plans based on who is qualified to assess and a clear, revised plan of the faculty involved in collecting data for the assessment. *This has been postponed by administration for decision during the summer.*

Program Objectives: (from most recent Assessment Plan)

Objective 1. Demonstrate knowledge of cell ultra structure and basic cellular process and develop an understanding of the requisites of life (MoSTEP competency category 1 and specific competencies 3.2, 4.1, 4.2, 4.3, and 4.7).

Objective 2 Converse with the basic tenets of transmission, molecular, development and population Genetics (MoSTEP competencies 4.3, 4.4).

Objective 3. Give an overview of the major organ system of the human body OR a comparative overview of these systems in the vertebrates. Either option will include the normal and pathological function of those organ systems.

Objective 4. Demonstrate knowledge of the diversity and taxonomy of organisms and the significance of variation in morphology, behavior and life history

Objective 5. Explain the role that natural selection, genetic drift and other phenomena have had on the production of biological diversity and the role evolution has in integrating explanations of both unity and diversity of life (MoSTEP competencies 4.4, 4.5, and 4.6).

Objective 6. Demonstrate knowledge scientific methodologies and usage of current scientific equipment and technologies.

moStep 3: The beginning teacher of science understands the central concepts, tools of inquiry, and structures of the physical sciences and makes these aspects of subject matter meaningful for students. 3.1: Atomic Structure; 3.2: General chemistry and chemical reactions in Physical and Life sciences

moSTEP 8: History and Nature of Science: The beginning teacher of science understands the history and nature of science as a human endeavor and uses this knowledge to make subject matter meaningful for students. 8.1 Science as a human endeavor; 8.2 Nature of Scientific Knowledge; 8.3 Historical Perspectives

*WWU Natural Science General Education Objective 4 also evaluates MoSTEP competency category 7.

*SCI230 (Earth Science) supports the beginning biology teacher via MoSTEP strand 5, which DESE notes is not required.

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Program Objectives Matrix (from most recent Assessment Plan)

	Obj.1	Obj. 2	Obj. 3	Obj. 4	Obj. 5	MoSTEP 3	MoSTEP 8
BIO114/115	I, A	I		I	I	I	
BIO124/125	R	I	I, A	R, A	R		
BIO209				R, A			
BIO231/232	R	M, A		R	R, A		
CHM114/115					R	I, R	
MAT114							
PHY201/202					R	M, A	
SCI205				R			I, A
SCI230*					R		

All objectives must be assessed either yearly or as articulated on a cycle. Objectives are not necessarily assessed each time they are listed as a Program objective for the course. The faculty in the program determine when the objective will be assessed, in which course, with which artifact, and what if any outside assessment will occur.

Fill in the chart with Program Specific Content- Much of this can come from past annual reports. When identifying the methods, consider fall and spring courses and assignments to identify appropriate assessments for the objectives. Best practices recommend multiple measures of assessment for each objective

Assessment of Program Objectives

Objective 1	Demonstrate knowledge of cell ultra structure and basic cellular process and develop an understanding of the requisites of life.
Methods	Final exam questions in BIO 114/115
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions.
Data Collected (course specific)	*BIO 114/115: 90% are proficient, n=50*
Data Collected (Assessment Day, external tests,	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the

Senior Achievement)	information is collected.
Results/Outcomes	*Beginning Students surpassed benchmark.*
Proposed changes to the assessment process	*None at this time*
Budget needs related to the objective?	*None*

Objective 2	Converse with the basic tenets of transmission, molecular, development and population genetics.
Methods	Final exam questions in BIO 231/232
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions.
Data Collected (course specific)	*BIO 231/232: 58% proficient; n=26.*
Data Collected (Assessment Day, external tests, Senior Achievement)	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.
Results/Outcomes	*Did not meet benchmark in BIO 231/232 (12% short).*
Proposed changes to the assessment process	*Maintain proficiency level (score of at least 70%), but lower the benchmark to 60%. For BIO 231/232 we expect lower scores.*
Budget needs related to the	*None*

objective?	

Objective3	Give an overview of the major organ system of the human body OR a comparative overview of these systems in the vertebrates. Either option will include the normal and pathological function of those organ systems.
Methods	Final exam questions in BIO 124/125
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions for each exam.
Data Collected (course specific)	*BIO 124/125: 86.7%; n=30*
Data Collected (Assessment Day, external tests, Senior Achievement)	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.
Results/Outcomes	Exceeded benchmark in BIO 124/125
Proposed changes to the assessment process	none
Budget needs related to the objective?	none

Objective 4	Explain the role that natural selection, genetic drift and other phenomena have had on the production of biological diversity and the role evolution has in integrating explanations of both unity and diversity of life.

Methods	Final exam questions in BIO 124/125
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions.
Data Collected (course specific)	N/A
Data Collected (Assessment Day, external tests, Senior Achievement)	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.
Results/Outcomes	N/A
Proposed changes to the assessment process	Discuss the Assessment Process, how did the data collection go? Do faculty need to modify assignments used for assessment, any changes made to Assessment Day activities. This section is on the Assessment Process, not the results. Do faculty need to work on rubrics, modify objectives, realign courses…
Budget needs related to the objective?	Are there any budget needs for the program to make the assessment more effective?

Objective 5	Demonstrate knowledge scientific methodologies and usage of current scientific equipment and technologies.
Methods	Final exam questions in BIO 231/232
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions for each exam.
Data Collected (course specific)	*BIO 231/232: 92% proficient; n=26*
Data Collected (Assessment Day, external tests, Senior	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.

Achievement)	
Results/Outcomes	*Benchmark surpassed in BIO 231/232.*
Proposed changes to the assessment process	*None at this time.*
Budget needs related to the objective?	*Approximately $125 for the Biology Major Field Test (the $125 covers all objectives, but we will mention it in each table).*

MoSTEP 3	The beginning teacher of science understands the central concepts, tools of inquiry, and structures of the physical sciences and makes these aspects of subject matter meaningful for students. 3.1: Atomic Structure; 3.2: General chemistry and chemical reactions in Physical and Life sciences
Methods	Final exam questions in PHY 201/202
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions for each exam.
Data Collected (course specific)	N/A
Data Collected (Assessment Day, external tests, Senior Achievement)	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.
Results/Outcomes	N/A
Proposed changes to the assessment process	Discuss the Assessment Process, how did the data collection go? Do faculty need to modify assignments used for assessment, any changes made to Assessment Day activities. This section is on the Assessment Process, not the results. Do faculty need to work on rubrics, modify objectives, realign courses…
Budget needs	Are there any budget needs for the program to make the assessment

related to the objective?	more effective?

MoSTEP 8	History and Nature of Science: The beginning teacher of science understands the history and nature of science as a human endeavor and uses this knowledge to make subject matter meaningful for students. 8.1 Science as a human endeavor; 8.2 Nature of Scientific Knowledge; 8.3 Historical Perspectives
Methods	Final exam questions in SCI 205
Benchmark	70% of students will be at proficient or better; proficient is a 70% or higher on the assessment questions for each exam.
Data Collected (course specific)	N/A
Data Collected (Assessment Day, external tests, Senior Achievement)	Explain the activities used out of class for assessment of the objective. Identify the total number of students in the assessment and how the information is collected.
Results/Outcomes	N/A
Proposed changes to the assessment process	Discuss the Assessment Process, how did the data collection go? Do faculty need to modify assignments used for assessment, any changes made to Assessment Day activities. This section is on the Assessment Process, not the results. Do faculty need to work on rubrics, modify objectives, realign courses…
Budget needs related to the objective?	Are there any budget needs for the program to make the assessment more effective?

Attach Rubrics and or other explanatory documents pertaining to program assessment discussed in the chart to the report (portfolio guidelines, assignment sheet)

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Analysis of Assessment:

Fall semester assessment data were collected for the first time this year and respective science faculty are satisfied with their course-*specific* components of this program.

None of the biology faculty are trained/apprised of appropriate DESE standards nor do they teach the education component (or are qualified to) of this program. Furthermore, we do not have access to these students for the majority of their coursework (education).

These reports will continue to be inadequate.

Analysis of the Assessment Process (Empirical & Non-Empirical) (HLC4B3)

There is no direct assessment of education in this program. All science-related measures are indirect since these students participate only in education dept. assessment days.

Program Changes Based on Assessment:

If this program continues to exist, there needs to be direction/administration from faculty competent in the area (secondary education).

General Education Assessment:

How do the General Education criteria align with the Program Objectives? What courses within your program build upon skills learned in general education courses (please list the program course and the general education criteria). The General Education areas are: Communication, Mathematics, Value, Meaning, Historical Perspective, Critical Thinking, Diversity, Creative and Aesthetic Sensibility, Natural Science and Social Science. (HLC 4B1) N/A??

Faculty filing this report do not have knowledge of or experience in the major components of this degree (secondary ed.).

Program Activities:

Student Performance Day Activities (Assessment Day):

These students participate only in Education Department assessment days.

Senior Achievement Day Presentations:

These students do not take BIO 450. Senior achievement must be through Education.

Service Learning Activities:

How is service learning infused in the coursework within your department? Is service or community engagement in the program mission? Describe the Service Learning Activities that your students and

department engaged in this past year. How did the activities improve student learning? How did the activities benefit the community? N/A??

Program Sponsored LEAD Events:

Highlight lead events sponsored by program faculty that are connected to program or general education objectives for the past academic year. Include a total number of lead events program faculty sponsored. N/A??

Student Accomplishments:

Highlight special examples of student successes in the field (academic: mentor-mentee, conference presentations, competitive internship, journal acceptance; extra-curricular: horse show championship, art exhibit). This is for any accomplishments that a student achieved outside of course work or the normal expectations of student success. N/A??

Faculty Accomplishments:

Robin Hirsch-Jacobson:

Reviewed manuscripts for *Canadian Journal of Zoology*

Kimberly L. Keller:

Published: "The FlxABCD-HdrABC proteins correspond to a novel NADH dehydrogenase/heterodisulfide reductase widespread in anaerobic bacteria and involved in ethanol metabolism in Desulfovibrio vulgaris Hildenborough" in *Environmental Microbiology Reports*.

Nicholas A. Pullen: attended Epigenetics conference at University of Missouri-Columbia;

Reviewed manuscripts for *Cancer Research, PLOS ONE,* and *Cancer Informatics*.

Published: "ADAM-10 is required for SCF-induced mast cell migration" in *Cellular Immunology*

"Modulation, mechanism and angiogenic potential of macrophage polarization (M1/M2) on electrospun bioresorbable vascular grafts." in *Cardiac Pathology*

Awarded extramural travel grant to the AAI master course July, 2015 in Long Beach, CA.

Alumni (Recent Graduates) Accomplishments (past year graduating class):

Results of Alumni survey and how well the program prepared them for their profession, this data is collected ourselves from contact with students. We can ask the alumni office to share what information they have on your graduates and then provide your own input to the data. Discuss special honors or positions earned by recent graduates of the program. This can be done on survey software, facebook, or an alternative platform that allows the information to be collected. N/A??

Assessment Rubric Annual Assessment Report					
Assessment Component	**Assessment Reflects Best Practices**	**Assessment Meets the Expectations of the University**	**Assessment Needs Development**	**Assessment is Inadequate**	**Comments:**
Learning Outcomes	☐ Program learning outcomes are aligned to national standards	☐ Measurable program learning outcomes. ☐ Learning outcomes are clearly articulated.	☐ Program learning outcomes have been identified and are somewhat measurable	☐ Program learning outcomes are not clear or measurable	☐ Need to work on objectives
Assessment Measures	☐ Multiple measures are used to assess student-learning outcomes. ☐ Rubrics or guides used are provided. ☐ All measurements are clearly described.	☐ Specific measures are clearly identified ☐ Measures relate to program learning outcomes. ☐ Measures can provide useful information about student learning.	☐ Some measurements are described, but need further description.	☐ Assessment measures do not connect to learning outcomes (objectives). ☐ Assessment measures are not clear. ☐ No assessment measures are established.	☐ Only minimal assessment provided and not all objectives have assessment happening.
Assessment Results	☐ All learning outcomes are assessed annually; or a rotation schedule is provided. ☐ Data are collected and analyzed to evaluate	☐ A majority of learning outcomes assessed annually. ☐ Data collected and aggregated are linked to specific learning outcome(s). ☐ Standards for student performance and	☐ Data collected and aggregated for at least one learning outcome (objectives). ☐ Data collection is incomplete ☐ Standards for student performance and gaps in student learning are not identified.	☐ Learning outcomes are not routinely assessed. ☐ Routine data is not collected. ☐ N/A Program is too new to have collected assessment	☐ Standards are recognized for the objectives that have data

	prior actions to improve student learning. ☐ Standards for performance and gaps in student learning are clearly identified.	gaps in student learning are recognized.		data.	
Assessment Component	**Assessment Reflects Best Practices**	**Assessment meets the expectations of the University**	**Assessment needs Development**	**Assessment is Inadequate**	**Comments:**
Faculty Analysis and Conclusions	☐ All faculty within the program synthesize the results from various assessment measures to form conclusions about each learning outcome. ☐ Includes input from adjunct faculty. ☐ Includes input from outside consultant.	☐ Program faculty receive annual assessment results and meet to discuss assessment results. ☐ Specific conclusions about student learning are made based on the available assessment results.	☐ Some program faculty receive annual assessment results ☐ Faculty input about results is sought	☐ Faculty input is not sought. ☐ Conclusions about student learning are not identified. ☐ N/A Program recently started or too few graduates to suggest any changes.	☐ There is little to no evidence of communication between science and education faculty.
Actions to	☐ A	☐ Description of	☐ Adjustments to	☐ No actions	☐ This is out of

Improve Learning and Assessment	comprehensive understanding of the program's assessment plan and suggestions for improvement. ☐ Clearly stated adjustments in curriculum as a result of assessment data. ☐ Actions are innovative in approach in attempt to improve student learning.	the action to improve learning or assessment is specific and relates directly to faculty conclusions about areas for improvement. ☐ Description of action includes a timetable for implementation and identifies who is responsible for action ☐ Actions are realistic, with a good probability of improving learning or assessment.	the assessment plan are proposed but not clearly connected to data ☐ Minimal discussion of the effectiveness of the assessment plan; minimal discussion of changes, if needed.	are taken to improve student learning. ☐ Actions discussed are not connected to data results or analysis. ☐ N/A Program recently started or too few graduates to suggest any changes.	the hands of the science faculty as the core content of the major is with education.

Additional Comments:

This is a program that needs work on the organization and structure of the curricular content. Students and faculty need more guidance.

Issues with assessment: Students do not attend Assessment Day activities generally in their content area. They see themselves as Education majors; this creates a gap in the ability of programs to assess for content.

In the assessment matrix, objective 4 is assessed in Bio 124/125 and in Bio 209. Areas of data that are not available to the faculty writing the report creates difficulty in completing the report. Clarification as to

the degree objectives is the first step as no one currently is clear as to the most current program objectives.

Secondary Education programs on campus are in transition due to the program review of secondary education last spring (may 2015). It is anticipated that the education department will look at the reporting/organizational structure of secondary education immediately.