Feedback for the 2013-2014 Annual Assessment Report
Department of Biological Sciences
Biological Sciences

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Spring 2015
California State University, Sacramento

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I. Summary Memo to the Deans/Chairs/Program Directors

To: **Chair, Department of Biological Sciences**
From: **Office of Academic Program Assessment (OAPA)**
Date: **Spring 2015**
Subject: **Feedback for the 2013-2014 Annual Assessment Report**
CC: **Office of Academic Affairs**

The 2013-2014 annual assessment reports are based on responses to the *2013-2014 Annual Assessment Report Template* prepared by the Office of Academic Program Assessment (OAPA). The feedback for the *2013-2014 Annual Assessment Report* is summarized below:

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We have used appropriate Western Associate of Schools and Colleges, WASC, rubrics for guidance on effective assessment practices in several areas, including the quality of learning outcomes, assessment plans, methods/data/analysis, program review, and the use of assessment data for curricular improvement, academic planning, and budgeting. These rubrics were provided in appendices in the *Feedback for the 2012-2013 Annual Assessment Report*, and will not be repeated here.

We hope all the previous **feedback** reports that you have received in recent years from OAPA in addition to the current one (2011-2012, 2012-2013, and now 2013-2014 Annual Assessment Feedback) will be used to help the academic unit (department, program, or college) determine the extent to which its current assessment system is adequate and what additional components or processes may need to be developed or improved for **all the degree programs** in the academic unit.

We would like to thank Dr. Don Taylor, Interim Assistant Vice President, Academic Programs and Global Engagement, Janett Torset, and our student assistants, Christian and Paul Schoenmann, for their assistance in this assessment review process.

If you have any questions or suggestions, please contact Dr. Amy Liu (liuqa@csus.edu), Director of OAPA.

Thank you.

II. Detailed Feedback for the 2013-2014 Annual Assessment Report
Biological Sciences BS

Template Questions	Detailed Questions/Criteria		Comments
Q1: Program Learning Outcomes (PLO) Assessed in 2013-2014	Q1.1. Which of the following program learning outcomes (PLOs) or Sac State Baccalaureate Learning Goals did you assess in 2013-2014?	Yes	1. Critical Thinking (WASC 1)
	Q1.1.1. Please provide more detailed information about the PLO(s) you checked above.	Yes	Capstone required-course assignment using modified VALUE Rubric
	Q1.2. Are your PLOs closely aligned with the mission of the university?	Yes	
	Q1.3. Is your program externally accredited (except for WASC)? If no, skip to Q1.4.	No	
	Q1.3.1. If yes, are your PLOs closely aligned with the mission/goals/outcomes of the accreditation agency?	N/A	
	Q1.4. Have you used the *Degree Qualification Profile* (DQP)[*] to develop your PLO(s)?	No	
Q2: Standards of Performance/Expectations for EACH PLO	Q2.1. Has the program developed/adopted EXPLICIT standards of performance/expectations for the PLO(s) you assessed in 2013-2014 Academic Year? If no, skip to *Q2.2*.	No	No, they plan to set standards
	Q2.1.1. If yes, what are the desired levels of learning, including the criteria and standards of performance/expectations, for each PLO?	Yes	No performance standard set. Plan to further modify the rubric.
	Q2.2. Have you published the PLO(s)/expectations/rubric(s) you assessed in 2013-2014? If no, skip to *Q3.1*.	Yes	
	Q2.2.1. If yes, where were the PLOs/expectations/rubrics published?	Yes	Rubrics used in courses where PLO was assessed
Q3: Data, Results, and Conclusions for EACH PLO	Q3.1. Was assessment data/evidence collected for 2013-2014? If no, skip to end, Part III.	Yes	
	Q3.2. If yes, was the data scored/evaluated for 2013-2014?	Yes	
	Q3.3. If yes, what DATA have you collected? What are the results, findings, and CONCLUSION(s) for EACH PLO assessed in 2013-2014?	Yes	Collected from all student papers, N=74. Data presented are student means and percentages.
	Q3.4.1 First PLO: Critical Thinking	Yes	No standard set

	Q3.4.1.A. Can the readers come to the SAME conclusion as the program that students meet the expectations/standards for this learning outcome?	Yes	
Q4: Evaluation of Data Quality: Reliability and Validity	Q4.1. How many PLOs in total did your program assess in the 2013-2014 academic year?	Yes	One
	Q4.1.A: According to you (the reader) has the program EXPLICITLY assessed each of the PLOs listed above?	Yes	
	Q4.2. Please choose ONE ASSESSED PLO as an example to illustrate how you use direct, indirect, and/or other methods/measures to collect data. If you only assessed one PLO in 2013-14. If ONE PLO, skip.	N/A	
	Q4.3. Were direct measures used to assess this PLO? If no, skip to *Q4.4*.	Yes	
	Q4.3.1. Which of the following DIRECT measures were used?	Yes	1. Capstone projects
	Q4.3.2. Please provide the direct measure(s) [key assignment(s)/project(s)/portfolio(s)] that you used to collect the data.	Yes	Final paper
	Q4.3.2.1. Was the direct measure(s) [key assignment(s)/project(s)/portfolio(s)] aligned directly with the rubric/criterion?	Yes	Final hypothesis paper assignment aligns with critical thinking rubric.
	Q4.3.3. Was the direct measure (s) [key assignment(s)/project(s)/portfolio(s)] aligned directly with the PLO?	Yes	
	Q4.3.4. How was the evidence scored/evaluated? If no, skip to *Q.4.3.7.*	Yes	3. Rubric developed by faculty
	Q4.3.5. What rubric/criterion was adopted to score/evaluate the above key assignments/projects/portfolio?	Yes	2. Modified VALUE rubric
	Q4.3.6. Was the rubric/criterion aligned directly with the PLO?	Yes	
	Q4.3.7. Were the evaluators (e.g., faculty or advising board members) who reviewed student work calibrated to apply assessment criteria in the same way?	Yes	
	Q4.3.8. Were there checks for inter-rater reliability?	Yes	
	Q4.3.9. Were the sample sizes for the direct measure adequate?	Yes	

	Q4.3.10. How did you select the sample of student work (papers, projects, portfolios, etc.)? Please briefly specify:	Yes	All student papers were used
	Q4.4. Were indirect measures used to assess the PLO? If no, skip to *Q4.5.*	No	
	Q4.4.1. Which of the following indirect measures were used?	N/A	
	Q4.4.2. If surveys were used, were the sample sizes adequate?		
	Q4.4.3. If surveys were used, please briefly specify how you select your sample? What is the response rate?		
	Q4.5. Were external benchmarking data used to assess the PLO? If no, skip to *Q.4.6.*	No	
	Q4.5.1. Which of the following measures was used?	N/A	
	Q4.6. Were other measures used to assess the PLO? If no, skip to *Q4.7.*	Yes	
	Q4.6.1. If yes, please specify:	Missing	
	Q4.7. Please describe how you collected the data? For example, in what course(s) (or by what means) were data collected? How reliable and valid is the data?	Yes	Capstone senior-level paper. All 74 students were required.
	Q4.8. How many assessment tools/methods/measures in total did you use to assess this PLO? If only <u>one</u>, skip to *Q5.1.*	Yes	One
	Q4.8.1. Did the data (including all the assignments/projects/portfolios) from all the different assessment tools/measures/methods directly align with the PLO?	N/A	
	Q4.8.2. Were ALL the assessment tools/measures/methods that were used good measures for the PLO?		
Q5: Use of Assessment Data	Q5.1. To what extent have the assessment results from 2012-2013 been used for?	Yes	
	Q5.1.1. Please provide one or two best examples to show how you have used the assessment data above.	Yes	Conversations have been started about effectiveness of VALUE rubric and modifications. Also, cap class sizes, 30 or fewer.
	Q5.2. As a result of the assessment effort in 2013-2014 and based on the prior feedbacks from OAPA, do you anticipate making any changes for your program? If no, skip to *Q.5.3.*	No	
	Q5.2.1. What changes are anticipated? By what mechanism will the changes be implemented? How and when will you assess the impact of proposed modifications?	N/A	

	Q5.2.2. Is there a follow-up assessment on these areas that need improvement?	Yes	
	Q5.3. If your program/academic unit has collected assessment data unrelated to PLOs, please briefly report your results here. (optional)	N/A	
Q6: Which program learning outcome(s) do you plan to assess next year?		1. Critical Thinking (WASC 1), 2. Information Literacy (WASC 2)	
Appendix	Are appendices related to the assessment reported?	N/A	
Summary	S1. Does the program follow the required assessment template?	Yes	
	S2. Is the assessment report easy to read and understand?	Yes	
	S3. Can the reader conclude that students in this program meet the standard(s) based on the data AND results provided in this report?	Yes	

III. Commendations and Recommendations

Commendations:

The program has made some improvement in its program assessment and is commended for addressing the following areas well:

Measures, Rubrics and their Alignment:
-Adopted nationally developed *VALUE rubrics*.
Standards of Performance at Graduation:
-Included rubrics in **all** courses where PLO was assessed.
Data Collection and Presentation:
-Used capstone course, BIO 188, to **directly** assess student learning outcomes at graduation.
-Used a large sample size to assess student learning.
Use of Assessment Data:
-Used assessment data and feedback from the **Office of Academic Program Assessment** to update the assessment plan and improve student learning.

Recommendations:

As the program continues its annual assessment efforts we also encourage addressing these areas:

Standards of Performance at Graduation:
-Develop **explicit** standards of performance for **all** assessment tools and PLOs and report the percentages of students who meet these standards **at graduation**.
-Include PLOs, rubrics, and standards of performance at graduation in **all** course syllabi, catalogs, handbooks, and websites so everyone, including students, faculty, and the general public, would know them.

Appendix 1: WASC "Rubric for Assessing the Quality of Academic Program Learning Outcomes"

http://www.wascsenior.org/search/site/Rubrics%20combined

Criterion	Initial	Emerging	Developed	Highly Developed
1.Comprehensive List	The list of outcomes is problematic: e.g., very incomplete, overly detailed, inappropriate, and disorganized. It may include only discipline-specific learning, ignoring relevant institution-wide learning. The list may confuse learning processes (e.g., doing an internship) with learning outcomes (e.g., application of theory to real-world problems).	The list includes reasonable outcomes but does not specify expectations for the program as a whole. Relevant institution-wide learning outcomes and/or national disciplinary standards may be ignored. Distinctions between expectations for undergraduate and graduate programs may be unclear.	The list is a well-organized set of reasonable outcomes that focus on the key knowledge, skills, and values students learn in the program. It includes relevant institution-wide outcomes (e.g., communication or critical thinking skills). Outcomes are appropriate for the level (undergraduate vs. graduate); national disciplinary standards have been considered.	The list is reasonable, appropriate, and comprehensive, with clear distinctions between undergraduate and graduate expectations, if applicable. National disciplinary standards have been considered. Faculty has agreed on explicit criteria for assessing students' level of mastery of each outcome.
2.Assessable Outcomes	Outcomes statements do not identify what students can do to demonstrate learning. "Statements understand scientific method" do not specify how understanding can be demonstrated and assessed.	Most of the outcomes indicate how students can demonstrate their learning.	Each outcome describes how students can demonstrate learning, e.g., "Graduates can write reports in APA style" or "Graduate can make original contributions to biological knowledge."	Outcomes describe how students can demonstrate their learning. Faculty has agreed on explicit criteria statements such as rubrics, and have identified example of student performance at varying levels of each outcome.
3.Alignment	There is no clear relationship between the outcomes and the curriculum that students experience.	Students appear to be given reasonable opportunities to develop the outcomes in the required curriculum.	The curriculum is designed to provide opportunities for students to learn and to develop increasing sophistication with respect to each outcome. This design may be summarized in a curriculum map.	Pedagogy, grading, the curriculum, relevant student support services, and co-curriculum are explicitly and intentionally aligned with each outcome. Curriculum map indicates increasing levels of proficiency.
4.Assessment Planning	There is no formal plan for assessing each outcome.	The program relies on short-term planning, such as selecting which outcome(s) to assess in current year.	The program has a reasonable, multi-year assessment plan that identifies when each outcome will be assessed. The plan may explicitly include analysis and implementation of improvements.	The program has a fully-articulated, sustainable, multi-year assessment plan that describes when and how each outcome will be assessed and how improvements based on findings will be implemented. The plan is routinely examined and revised, as needed.
5.The Student Experience	Students know little or nothing about the overall outcomes of the program. Communication of outcomes to students, e.g. in syllabi or catalog, is spotty or nonexistent.	Students have some knowledge of program outcomes. Communication is occasional and informal, left to individual faculty or advisors.	Students have a good grasp of program outcomes. They may use them to guide their own learning. Outcomes are included in most syllabi and are readily available in the catalog, on the web page, and elsewhere.	Students are well-acquainted with program outcomes and may participate in creation and use of rubrics. They are skilled at self-assessing in relation to the outcome levels of performance. Program policy calls for inclusion of outcomes in all course syllabi, and they are readily available in other program documents.

Appendix 2: Sacramento State Baccalaureate Learning Goals for The 21st Century & AAC&U's 16 VALUE Rubrics
http://www.csus.edu/wascaccreditation/Documents/Endnotes/E044.pdf

1. **Competence in the Disciplines**: The ability to demonstrate the competencies and values listed below in *at least one major field of study* and to demonstrate informed understandings of other fields, drawing on the knowledge and skills of disciplines outside the major.

2. **Knowledge of Human Cultures and the Physical and Natural World** through study in the *sciences and mathematics, social sciences, humanities, histories, languages, and the arts.* Focused by engagement with big questions, contemporary and enduring.

3. **Intellectual and Practical Skills, including:** *inquiry and analysis, critical, philosophical, and creative thinking, written and oral communication, quantitative literacy, information literacy, teamwork and problem solving,* practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance.
    - 3.1 Critical thinking (WASC core competency)
    - 3.2 Information literacy (WASC core competency)
    - 3.3 Written communication (WASC core competency)
    - 3.4 Oral communication (WASC core competency)
    - 3.5 Quantitative literacy (WASC core competency)
    - 3.6 Inquiry and analysis (Sixth VALUE rubric)
    - 3.7 Creative thinking (Seventh VALUE rubric)
    - 3.8 Reading (Eighth VALUE rubric)
    - 3.9 Teamwork (Ninth VALUE rubric)
    - 3.10 Problem solving (Tenth VALUE rubric)

4. **Personal and Social Responsibility (Values), including:** *civic knowledge and engagement—local and global, intercultural knowledge and competence*, ethical reasoning and action, foundations and skills for lifelong learning* anchored through active involvement with diverse communities and real-world challenges.
    - 4.1 Civic knowledge and engagement—local and global (Eleventh VALUE rubric)
    - 4.2 Intercultural knowledge and competence (Twelfth VALUE rubric)
    - 4.3 Ethical reasoning (Thirteenth VALUE rubric)
    - 4.4 Foundations and skills for lifelong learning (Fourteenth VALUE rubric)
    - 4.5 Global Learning (Fifteenth VALUE rubric)

5. **Integrative Learning **, including:** *synthesis and advanced accomplishment* across general and specialized studies.
    - a. Integrative and applied learning (Sixteen VALUE rubric)

    All of the above are demonstrated through the application of knowledge, skills, and responsibilities (values) to new settings and complex problems.

    *Understanding of and respect for those who are different from oneself and the ability to work collaboratively with those who come from diverse cultural backgrounds.

** Interdisciplinary learning, learning communities, capstone or senior studies in the General Education program and/or in the major connecting learning goals with the content and practices of the educational programs including GE, departmental majors, the co-curriculum and assessments.

Appendix 3: Important Considerations for Program Review & Assessment

Please keep the following questions in mind when you (program, department, or the college) assess student learning outcomes and improve the programs:

1) What are your program learning outcomes (PLOs): **what should your students know, value, and be able to do (at the time of graduation)?** Are the PLOs aligned closely with the missions and vision of the university and the college/department/program? Is each program learning outcome aligned closely with the curriculum, the key assignment, pedagogy, grading, the co-curriculum, or relevant student support services?

2) Is each PLO assessable? What **rubrics** are used to assess a particular program learning outcome? What are the explicit **criteria** and **standards of performance** for each outcome? Have you achieved the learning outcomes: **the standards near or at graduation**?

3) **What are the data, findings, and analyses for EACH program learning outcome? What is the quality of the data: how reliable and valid is the data?** Other than GPA, what data/evidences are used to determine whether your graduates have achieved the stated outcomes for the degree (BA/BS or MA/MS)? If two or more pieces of assessment data are used for each outcome, is the data consistent or contradictory?

4) Are these PLOs (together with the data and the standards of performance **near or at graduation**) able to demonstrate the **meaning, quality, integrity and uniqueness** of your degree program?

5) **Who is going to use the data**? Are the data, findings, or analyses clearly presented so they are easy to understand and/or use? Is the data used only for the course or for the program where the data is collected, or is the data also used broadly for the curriculum, budgeting, or strategic planning at the department, the college, or the university?

6) **Are students aware of these learning outcomes?** Do they often use them to assess the learning outcomes themselves? Where are the program learning outcomes published for view, e.g., across programs, with students, in the course syllabus, the department websites or catalogs? Are they widely shared?

7) Has the program conducted **follow-up assessment** to evaluate the effectiveness of program changes made based on assessment data? **If yes, how effective are those changes to improve student learning and success?** If no, what is your plan to assess the effectiveness of those changes?

8) **Is there an assessment plan for each unit (program, department, or college)?** Have curriculum maps been developed? Does the plan clarify when, how, and how often each outcome will be assessed? Will all outcomes be assessed over a reasonable period of time such as within a six-year program review cycle? Is the plan sustainable in terms of human, fiscal, and other resources? Will the assessment plan be revised as needed?

Appendix 4: Relevant Verbs in Defining Learning Outcomes
(Based on Bloom's Taxonomy)

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Cite	Arrange	Apply	Analyze	Arrange	Appraise
Define	Classify	Change	Appraise	Assemble	Assess
Describe	Convert	Compute	Break Down	Categorize	Choose
Identify	Describe	Construct	Calculate	Collect	Compare
Indicate	Defend	Demonstrate	Categorize	Combine	Conclude
Know	Diagram	Discover	Compare	Compile	Contrast
Label	Discuss	Dramatize	Contrast	Compose	Criticize
List	Distinguish	Employ	Criticize	Construct	Decide
Match	Estimate	Illustrate	Debate	Create	Discriminate
Memorize	Explain	Interpret	Determine	Design	Estimate
Name	Extend	Investigate	Diagram	Devise	Evaluate
Outline	Generalize	Manipulate	Differentiate	Explain	Explain
Recall	Give Examples	Modify	Discriminate	Formulate	Grade
Recognize	Infer	Operate	Distinguish	Generate	Interpret
Record	Locate	Organize	Examine	Manage	Judge
Relate	Outline	Practice	Experiment	Modify	Justify
Repeat	Paraphrase	Predict	Identify	Organizer	Measure
Reproduce	Predict	Prepare	Illustrate	Perform	Rate
Select	Report	Produce	Infer	Plan	Relate
State	Restate	Schedule	Inspect	Prepare	Revise
Underline	Review	Shop	Inventory	Produce	Score
	Suggest	Sketch	Outline	Propose	Select
	Summarize	Solve	Question	Rearrange	Summarize
	Translate	Translate	Relate	Reconstruct	Support
		Use	Select	Relate	Value
			Solve	Reorganize	
			Test	Revise	

Page 37: Adapted from Gronlund (1991).

Allen, Mary. 2004. "Assessing Academic Programs in Higher Education". San Francisco, CA: Anker Publishing, Part of Jossey-Bass.

Appendix 5: Background Information for Academic Program Assessment and Review

Ideally, academic program assessment and review at Sacramento State should be an ongoing process that facilitates continuous program improvement and includes the following areas[1]:

Assessment Plan: Each program needs to develop a program assessment plan which contains the following elements: Program goals and learning outcomes, methods for assessing progress toward these outcomes, and a timetable. This plan should be updated annually or frequently.

Annual Program Assessment Report: Program learning outcomes (PLOs) should be directly aligned with course learning outcomes (CLOs) and the University Baccalaureate Learning Goals (UBLGs). Programs are asked to provide the Office of Academic Affairs with an annual report (annual assessment report -AAR) on program assessment activities that occurred during the past academic year. These reports should identify learning goals and outcomes that were targeted for program assessment, measures used to evaluate progress toward those outcomes, data and analysis, and changes made or planned in response to the results. Annual program assessment and the assessment reports provide a solid foundation and data for the six year program review at Sacramento State.

Program Review: Each department undertakes an extensive program review every six years. As part of the program review process, departments are asked to use annual program assessment data to evaluate how well students are meeting program learning outcomes and university learning goals.

Thus, each department in our university should have in place a system for collecting and using evidence to improve student learning. So far, not all departments have established program learning outcomes and/or approaches to assess learning for all degree programs; it is essential to make these expectations explicit. This will help departments and colleges to assure that every degree program has or will have in place a quality assurance system for assessing and tracking student learning, and use this information to improve their respective programs. Importantly, departments should also present learning expectations, data, findings, and analysis in a way that is easy to understand and/or to use by the faculty, students, administration, the general public, accreditation agencies, and policy-makers.

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[1] Adapted from the information at http://webapps2.csus.edu/assessment/