



Feedback for the 2014-2015 Annual Assessment Report
Department of Biological Sciences
Biological Sciences BS

Amy Liu, Ph.D.
Director, Office of Academic Program Assessment (OAPA)
Professor of Sociology

Chia-Jung Chung, Ph.D.
Assessment Consultant, OAPA
Associate Professor of Education

Judith Kusnick, Ph.D.
Assessment Consultant, OAPA
Professor of Geology

Elizabeth Strasser, Ph.D.
Assessment Consultant, OAPA
Professor of Anthropology

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California State University, Sacramento
Office of Academic Program Assessment
6000 J Street • Eureka Hall 203 • Sacramento, CA 95819-3709
(916) 278-2497
<http://www.csus.edu/programassessment>

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

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

The 2014-2015 annual assessment reports are based on responses to the [2014-2015 Annual Assessment Report Template](#) prepared by the [Office of Academic Program Assessment](#) (OAPA). The feedback for the *2014-2015 Annual Assessment Report* is summarized below:

Section:	Details:
I	Summary Memo to Deans/Chairs/Program Directors
II	Detailed Feedback for the 2014-2015 Annual Assessment Report
III	Commendations and Recommendations
Appendix 1:	WSCUC “Rubric for Assessing the Quality of Academic Program Learning Outcomes”
Appendix 2:	Sacramento State Baccalaureate Learning Goals for the 21st Century & AAC&U’s 16 VALUE Rubrics
Appendix 3:	Important Considerations for Program Review and Assessment
Appendix 4:	Relevant Verbs in Defining Learning Outcomes
Appendix 5:	Background Information for Academic Program Assessment and Review

We have used appropriate rubrics from WASC Senior College and University Commission (WSCUC) 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 (2011-2012, 2012-2013, and 2013-2014) in addition to the current one (2014-2015) 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, and Academic Programs, Janett Torset, Kathy Mine, and our student assistants, Christian and Paul Schoenmann, for their support 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 2014-2015 Annual Assessment Report Biological Sciences BS

Template Questions	Detailed Questions, Criteria, and Comments		
Q1: Program Learning Outcomes (PLOs)	Q1.1. Which of the following Program Learning Outcomes (PLOs) and Sac State Baccalaureate Learning Goals (BLGs) did you assess in 2014-2015?	Yes	Critical Thinking
	Q1.2. Please provide more detailed background information about each PLO you check above and other information such as how your specific PLOs were explicitly linked to the Sac State BLGs?	Yes	"Intellectual and practical skills in the BLGs"
	Q1.2.1. Do you have rubrics for your PLOs?	2	Yes, but for some PLOs
	Q1.3. Are your PLOs closely aligned with the mission of the university?	Yes	
	Q1.4. Is your program externally accredited (other than through WASC)? (If No or Don't know, skip to Q1.5)	No	
	Q1.4.1. If the answer to Q1.4 is yes, are your PLOs closely aligned with the mission/goals/outcomes of the accreditation agency?	N/A	
	Q1.5. Did your program use the Degree Qualification Profile (DQP) to develop your PLO(s)?	2	No, but I know what DQP is
	Q1.6. Did you use action verbs to make each PLO measurable?	Yes	
Q2: Standards of Performance/Expectation for the Selected PLO	Q2.1. Specify one PLO as an example to illustrate how you conducted assessment (be sure you checked the correct box for this PLO in Q1.1):	Yes	Critical Thinking – students will be asked to do a sophisticated study/paper
	Q2.2. Has the program developed or adopted explicit standards of performance for this PLO?	No	
	Q2.3. Please provide the rubric(s) and standard of performance that you have developed for this PLO:	Yes	See Appendix 2. VALUE Critical Thinking Rubric. Modified for Biological Sciences. S. Datwyler, K. McDonald & A. Rechs; May 28, 2015 No standard yet.
	Q2.4. Please indicate the category in which the selected PLO falls into.	Yes	Critical Thinking
	Q2.5. Please indicate where you have published the PLO:	Yes	E.g., in some course syllabi, in the assessment plan, and new course proposal forms
	Q2.6. Please indicate where you have published the standard of performance:	Missing	Not answered
	Q2.7. Please indicate where you have published the rubric that measures the PLO:	Yes	E.g., in the assessment plan

Q3: Data Collection Methods and Evaluation of Data Quality for the Selected PLO	Q3.1. Was assessment data/evidence collected for the selected PLO in 2014-2015? (If No, Don't know, N/A, skip to Q6)	Yes	
	Q3.1A. How many assessment tools/methods/measures in total did you use to assess this PLO?	Yes	One
	Q3.2. If yes, was the data scored/evaluated for this PLO in 2014-2015? (If No, Don't know, N/A, skip to Q6)	Yes	
	Q3.2A. Please describe how you collected the assessment data for the selected PLO. For example, in what course(s) or by what means were data collected?	Yes	Collected in required capstone class Bio 188; culminating paper, 15 random samples per section, 30 total
Q3A: Direct Measures (key assignments, projects,	Q3.3. Were direct measures [key assignments, projects, portfolios, etc.] used to assess this PLO? (If No or Don't know, skip to Q3.7)	Yes	
	Q3.3.1. Which of the following direct measures were used?	Yes	Key required assignments
	Q3.3.2. Please attach the direct measure you used to collect data.	Yes	See Appendix 1 for the paper prompt
	Q3.4. How was the data evaluated? (If No, skip to Q3.5)	6	Modified VALUE rubric for Critical Thinking
	Q3.4.1. Was the direct measure (e.g. assignment, thesis, etc.) aligned directly and explicitly with the PLO?	Yes	
	Q3.4.2. Was the direct measure (e.g. assignment, thesis, etc.) aligned directly and explicitly with the rubric?	Yes	
	Q3.4.3. Was the rubric aligned directly and explicitly with the PLO?	Yes	
	Q3.5. How many faculty members participated in planning the assessment data collection of the selected PLO?	Yes	Three faculty planned, 13 participated in evaluation
	Q3.5.1. If the data was evaluated by multiple scorers, was there a norming process (a procedure to make sure everyone was scoring similarly)?	Yes	
	Q3.6. How did you select the sample of student work [papers, projects, portfolios, etc.]?	Yes	Selected at random from one of two sections using number generator, totaling 30.
	Q3.6.1. How did you decide how many samples of student work to review?	Yes	Size determined based on evaluation volunteers (Goal: each evaluator to read no more than six papers.)
	Q3.6.2. How many students were in the class or program?	Yes	40 per class section times two sections = about 160 per academic year
	Q3.6.3. How many samples of student work did you evaluate?	Yes	30
	Q3.6.4. Was the sample size of student work for the direct measure adequate?	Yes	

Q3B: Indirect Measures (surveys, focus groups, interviews, etc.)	Q3.7. Were indirect measures used to assess the PLO? (If No, skip to Q3.8)	No	
	Q3.7.1. Which of the following indirect measures were used?	N/A	
	Q3.7.2. If surveys were used, how was the sample size decided?	N/A	
	Q3.7.3. If surveys were used, briefly specify how you selected your sample.	N/A	
	Q3.7.4. If surveys were used, what was the response rate?	N/A	
Q3C: Other Measures (external benchmarking, licensing exams, standardized tests, etc.)	Q3.8. Were external benchmarking data such as licensing exams or standardized tests used to assess the PLO? (If No, skip to Q3.8.2)	No	
	Q3.8.1. Which of the following measures were used?	N/A	
	Q3.8.2. Were other measures used to assess the PLO? (If No or Don't Know, skip to Q3.9)	Yes	
	Q3.8.3. If other measures were used, please specify:	Yes	<u>The Critical Thinking Assessment Test:</u> Was used in introductory and intermediate skill level classes. Will introduce to advanced level class during 2015-16 and will be reported next year.
Q3D: Alignment and Quality	Q3.9. Did the data, including the direct measures, from all the different assessment tools/measures/methods directly align with the PLO?	Yes	
	Q3.9.1. Were ALL the assessment tools/measures/methods that were used good measures for the PLO?	Yes	
Q4: Data, Findings, and Conclusions	Q4.1. Please provide simple tables and/or graphs to summarize the assessment data, findings, and conclusions:	Yes	Students performing at a real low level in critical thinking skills. They performed better at rallying evidence and drawing conclusions than in developing a hypothesis. Table 1 of mean student scores for three rubric dimensions and two figures. Figure 1 illustrates the distribution of percentage scoring two or higher on three rubric dimensions. Figure 2 of percentage scoring three or higher – see it only on hypothesis generation.
	Q4.1a. Does the program explicitly assess the PLO?	Yes	
	Q4.2. Are students doing well and meeting program standard? If not, how will the program work to improve student performance of the selected PLO?	No	Not as well as hoped for. This is first real evaluation of the PLO since the revision of the major five years ago. Ongoing discussions will ensue.
	Q4.2a. Can the readers come to the SAME conclusion?	Yes	
	Q4.3. Do students partially meet, meet, or exceed the program's standard of performance (Q2.2) based on their assessment data?	5	No expectation set. They are still collecting data to determine an appropriate standard.

	Q4.3a. Can the readers come to the SAME conclusion as the program that students meet the expectations/standards for this learning outcome?	Yes	
Q5: Use of Assessment Data (Closing the Loop)	Q5.1. As a result of the assessment effort in 2014-2015 and based on the prior feedback from OAPA, do you anticipate making any changes for your program (e.g., course structure, course content, or modification of PLOs)? (If No or Don't Know, skip to Q6)	Yes	
	Q5.1.1. Please describe what changes you plan to make in your program as a result of your assessment of this PLO. Include a description of how you plan to assess the impact of these changes	Yes	Discuss outcomes of AY 14-15 assessment during retreat. "These results come at a pivotal time for our department as there is an NSF-funded project...taking effect in Fall 2015 to incorporate authentic research experiences into 12 courses within the curriculum."
	Q5.1.2. Do you have a plan to assess the impact of the changes that you anticipate making?	Yes	
	Q5.2. How have the assessment data from last year (2013 - 2014) been used so far?	Yes	In a variety of ways
	Q5.2.1. Please provide a detailed example of how you used the assessment data above.	Yes	"2013-14 involved the development of a revised set of learning outcomes for the Department as well as a preliminary modification of the VALUE rubric for critical thinking"
Additional Assessment Activities	Q6. Many academic units have collected assessment data on aspects of a program that are not related to PLOs (i.e., impacts of an advising center, etc.). If your program/academic unit has collected data on the program elements, please briefly report your results	N/A	
	Q7. What PLO(s) do you plan to assess next year?	Yes	Critical Thinking and Information Literacy
	Q8. Have you attached any appendices?	Yes	Appendix 1: Key Assignment Prompt Appendix 2: Modified VALUE Rubric
Summary	S1. Does the program follow the template by answering where applicable?	Yes	
	S2. Were the program's answers simple and clear?	Yes	
	S3. Does the program assess the PLO using correct alignment of standard, rubric, and measure (Q2.3, Q4.1a)?	Yes	
	S4. Overall, do students partially meet, meet, or exceed program's standard of performance based on consultant's review (Q4.3a)?	No	They say they are not satisfied with student performance and have made plans to allow their students to do better.

*Highlighted (close-ended) questions receive answers corresponding to assessment report answer. Open-ended questions receive answers based on consultant remarks using consultant legend: 1) Yes; 2) Partially; 3) Don't Know; 4) No; 5) Not-Clear; 8) Not-Applicable; 9) Missing

III. Commendations and Recommendations

Commendations:

The program has continued to have an exemplary assessment process and a high quality assessment report, and is commended for addressing the following areas well:

Measures, Rubrics and their Alignment:

- Used a modified VALUE rubric well aligned to the PLO.

Standards of Performance at Graduation:

- Working towards setting a standard, once they know that the assignment is measuring what it is they want students to do.

Data Collection and Presentation:

- Provided an example of excellent sampling and norming processes.
- Presented illustrative tables and figures and a well-conceived data analysis.

Use of Assessment Data:

- The group of assessors had productive discussions about the difficulty of the assignment as well as about how to modify lower-level courses so that students will be able to think more critically by the time they approach graduation.
- The results were to be shared with other faculty at fall retreat.

Recommendations:

As the program continues its annual assessment efforts we encourage it to:

Standards of Performance at Graduation:

- Consider developing a standard of performance for this PLO even though this is a new way of measuring critical thinking.

Data Collection and Presentation:

- It would be useful to present the data as the percentage of students performing at each level of the rubric rather than as an average. Averages are affected by outliers. The graphs were useful, but hard to understand in the absence of data on students' performance at all levels of the rubric.

Use of Assessment Data:

It seems reasonable to reconsider the assessment in light of the data, but be sure to think about changing instruction as well. We agree that the embedded undergraduate research experiences should have an impact on critical thinking skills. Consider whether the current assessment will be well-aligned with what students learn through their undergraduate research experiences, or whether other instructional experience will also be necessary. As usual, the department has displayed a great willingness to do self-reflection, and we have confidence that these issues will be successfully resolved.

Appendix 1: WSCUC “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](#) (WSCUC core competency)
 - 3.2 [Information literacy](#) (WSCUC core competency)
 - 3.3 [Written communication](#) (WSCUC core competency)
 - 3.4 [Oral communication](#) (WSCUC core competency)
 - 3.5 [Quantitative literacy](#) (WSCUC 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 areas¹:

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.

¹ Adapted from the information at <http://webapps2.csus.edu/assessment/>