



Feedback for the 2014-2015 Annual Assessment Report
Department of Mathematics
Mathematics & Statistics BA

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

To: Chair, Department of Mathematics
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:

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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 Mathematics & Statistics BA

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	Oral Communication
	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	PLO 4: The mathematics major at CSUS is expected to demonstrate an ability to effectively communicate mathematical thought. Rubric found in Appendix A
	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	Limited use
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	Oral Communication
	Q2.2. Has the program developed or adopted explicit standards of performance for this PLO?	Yes	
	Q2.3. Please provide the rubric(s) and standard of performance that you have developed for this PLO:	Yes	Rubric is included in Appendix A, standard in answer to Q4.2.
	Q2.4. Please indicate the category in which the selected PLO falls into.	Yes	Oral Communication
	Q2.5. Please indicate where you have published the PLO:	Yes	In some course syllabi
	Q2.6. Please indicate where you have published the standard of performance:	Yes	In some course syllabi
	Q2.7. Please indicate where you have published the rubric that measures the PLO:	Yes	In some course syllabi
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	Data assembled by instructor of capstone Math 193. Assessing students moving into Teacher Credential Program.
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	Capstone projects and classroom based performance assessments
	Q3.3.2. Please attach the direct measure you used to collect data.	Yes	See Appendix B
	Q3.4. How was the data evaluated? (If No, skip to Q3.5)	6	Modified VALUE rubric
	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?	Partial	The PLO is organized rather differently than the rubric.
	Q3.5. How many faculty members participated in planning the assessment data collection of the selected PLO?	Yes	One collected, three involved in planning and assessing the data.
	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)?	No	
	Q3.6. How did you select the sample of student work [papers, projects, portfolios, etc.]?	Yes	All presentations were assessed
	Q3.6.1. How did you decide how many samples of student work to review?	Yes	All student work was reviewed
	Q3.6.2. How many students were in the class or program?	Yes	11
	Q3.6.3. How many samples of student work did you evaluate?	Yes	33 presentations, 3 from each student
	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)	No	
	Q3.8.3. If other measures were used, please specify:	N/A	
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?	Not Clear	Unclear. The task seems aligned with the PLO, but the rubric is less well-aligned to the PLO.
	Q3.9.1. Were ALL the assessment tools/measures/methods that were used good measures for the PLO?	Not Clear	Unclear. The task seems aligned with the PLO, but the rubric is less well-aligned to the PLO.
Q4: Data, Findings, and Conclusions	Q4.1. Please provide simple tables and/or graphs to summarize the assessment data, findings, and conclusions:	Yes	It would be more useful to see the percentage of students performing at various levels of the rubric rather than means.
	Q4.1a. Does the program explicitly assess the PLO?	Not Clear	
	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?	Yes	Low student performance using the rubric suggests that a more appropriate rubric be used. Additionally, faculty help of students must be factored in to scoring. They present standard in answer: students should average at least 2.5 on their presentations and entire class to average 2.75.
	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?	3	Partially
	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)	No	

	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	N/A	
	Q5.1.2. Do you have a plan to assess the impact of the changes that you anticipate making?	N/A	
	Q5.2. How have the assessment data from last year (2013 - 2014) been used so far?	Yes	Been used somewhat
	Q5.2.1. Please provide a detailed example of how you used the assessment data above.	Missing	
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	Oral Communication (Says they need to revisit this PLO)
	Q8. Have you attached any appendices?	Yes	Appendix A: Oral Communications Rubric Appendix B: Oral Communications Data
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)?	Partial	Alignment of rubric and PLO not clear.
	S4. Overall, do students partially meet, meet, or exceed program's standard of performance based on consultant's review (Q4.3a)?	Partial	Partially

*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 continues to work on its assessment process, and is commended for addressing the following areas well:

Program Learning Outcomes and their Alignment:

- Specified PLO and defined its meaning in the context of this program.

Measures, Rubrics and their Alignment:

- Used a well-developed modified VALUE rubric.
- Used three presentations per student.

Use of Assessment Data:

- This assessment caused the faculty involved to reconsider the expectations of the rubric that they are using.

Recommendations:

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

Measures, Rubrics and their Alignment:

- The measure seems to be administered in a course in the pre-teaching concentration. Are the results generalizable to students in other concentrations?
- Consider the alignment of the rubric and the subitems of the PLO. If effective board use (in the rubric) is important, perhaps it should be in the PLO. If the careful use of mathematical notation (in the PLO) is important, perhaps it should be in the rubric.
- It is not clear who the intended audience for the presentation is: university faculty, or high school students.
- Be careful in adjusting the rubric that you do not lower expectations instead of improving instruction. It is a good idea to reconsider the rubric, but also consider how instruction could be restructured to help students meet ambitious learning goals. Are students provided with multiple opportunities to practice these skills across the curriculum?

Standards of Performance at Graduation:

- For purposes of instructional improvement, it would be more useful to express the standard of performance as the percentage of students performing at a desired level (e.g., 70% of students score 3 or above for each criterion of the rubric). Averages are affected by outliers, and provide a less clear picture of student performance.
- In the future, it would be helpful if the standard were given in response to Q2.3, rather than Q4.2.

Data Collection and Presentation:

- While the scores of the three different scorers are somewhat consistent, consider using a norming process for the scorers to calibrate their scoring.
- Please present the data as the percentage of students performing at various levels of the rubric.
- Since the program recognizes that there is significant faculty assistance in preparing the presentations, consider measuring progress toward this PLO in another course or assignment in which faculty are less involved in student preparation.

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/>