

*Subject Area Committee Name:* Mathematics

*Core Outcome Being Assessed:*

*Contact Person*

<i>Name</i>	<i>e-mail</i>
Emiliano Vega Austina Fong	emiliano.vega@pcc.edu austina.fong@pcc.edu

Document your plan for this year's core outcome assessment report(s) in the first sections of this form. This plan should be consistent with the Multi-Year Plan you have submitted to the LAC. If your SAC is using an assessment design that captures two Core Outcomes, use a separate planning form for each outcome, **even if you are assessing both in a single project**. Complete each section of each form. In some cases, all of the information needed to complete the section may not be available at the time the report is being written. In those cases, include the missing information when submitting the completed report at the end of the year.

- Use separate report forms for each outcome your SAC is assessing.
- Refer to the help document for guidance in filling-out this report. If this document does not address your question/concern, contact [Michele Marden](#) to arrange for coaching assistance.
- Please attach all rubrics/assignments/etc. to your report submissions.
- **Subject Line of Email:** Assessment Report Form (or ARF) for <your SAC name> (Example: ARF for MTH)
- **File name:** SACInitials\_ARF\_2015 (Example: MTH\_ARF\_2015)
- SACs are encouraged to share this report with their LAC coach for feedback before submitting.
- Make all submissions to [learningassessment@pcc.edu](mailto:learningassessment@pcc.edu).

**Due Dates:**

- **Planning Sections of LAC Assessment or Reassessment Reports: November 7<sup>th</sup>, 2014**
- **Changes to Multi-Year Plan submitted last year: November 7<sup>th</sup>, 2014**
- **Completed LAC Assessment or Reassessment Reports: June 19<sup>th</sup>, 2015**

*Please Verify These Before Beginning this Report:*

☐ This project is in the first stage of the assess/re-assess process (if this is a follow-up, re-assessment project, use the LAC Re-assessment Report Form LDC. Available at:

<http://www.pcc.edu/resources/academic/learning-assessment/LDC-2013-2014-Info-Templates.html>

☒ This project is aligned with the SAC's Multi-Year Plan. Available for review at:

<http://www.pcc.edu/resources/academic/degree-outcome/AssessmentPlansFall2010.html>. If there are changes, Multi-Year Plans can be altered and resubmitted to meet the current needs of the SAC.

**1. Core Outcome**

1A. PCC Core Outcome: Professional Competence

1B. The Core Outcomes can look different in different disciplines and courses. For example, professional competence in math might emphasize the procedural skills needed for the next course; professional competence in psychology might emphasize the ability to interpret the meaning of some basic statistics. Briefly describe how your SAC will be identifying and measuring your students' attainment of this core outcome below.

Professional Competence can be measured by looking at it if our students succeed in the classes they take and in subsequent classes they take. As such we will be looking at student pass rates in all of the math classes that students can place into and if there is any association between success and method of placement into that particular class. Potential placement methods include: the prerequisite course(s), the COMPASS placement test, or SAT/ACT scores.

1C. Ideally, assessment projects are driven by faculty curiosity about student learning (e.g., are they really getting what is expected in this course?). Briefly share how/why the faculty expectation assessed in this report is useful to your students. Continuing with the above examples, if math students do not have the expected procedural skills for the next course, they may not be successful; psychology students are required to read and understand peer-reviewed research in the next course – so the ability to interpret basic statistics is essential for success in the next course.

Historically, the Math department has had about a 60% pass rate for DE math classes (Math 20, 60, 65, 70 and 95), as well as Math

111 and 112. This has continually led to discussion of if students have the expected procedural skills to succeed in the next course, which in turn raises the questions, were they placed in the "right" course to start. If placed too high a student will likely not retain the needed skills, if placed too low they are at risk of keeping some skills but not others since many students placed too low "check out" at some point during the term. While there may be no perfect class to place students into, we feel it is very important to look at recent history (4-5 years) of how our students place and if they succeed. We hope to see trends or associations that we can either improve upon or change so that students begin in the best possible math class for their current skill set.

## 2. Project Description

### 2A. Assessment Context

**Check all the applicable items:**

- ☐ **Course based assessment.**  
 Course names and number(s):  
 Expected number of sections offered in the term when the assessment project will be conducted:  
 Number of these sections taught by full-time instructors:  
 Number of these sections taught by part-time instructors:  
 Number of distance learning/hybrid sections:  
 Type of assessment (e.g., essay, exam, speech, project, etc.):  
 Are there course outcomes that align with this aspect of the core outcome being investigated? ☐ Yes ☐ No  
 If yes, include the course outcome(s) from the relevant CCOG(s):
- ☐ **Common/embedded assignment in all relevant course sections.** An embedded assignment is one that is already included as an element in the course as usually taught. Please attach the activity in an appendix. If the activity cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):
- ☐ **Common – but not embedded - assignment used in all relevant course sections.** Please attach the activity in an appendix. If the activity cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):
- ☐ **Practicum/Clinical work.** Please attach the activity/checklist/etc. in an appendix. If this cannot be shared, indicate the type of assessment (e.g., supervisor checklist, interview, essay, exam, speech, project, etc.):
- ☐ **External certification exam.** Please attach sample questions for the relevant portions of the exam in an appendix (provided

that publically revealing this information will not compromise test security). Also, briefly describe how the results of this exam are broken down in a way that leads to nuanced information about the aspect of the core outcome that is being investigated.

☐ **SAC-created, non-course assessment.** Please attach the assessment in an appendix. If the assessment cannot be shared, indicate the type of assignment (e.g., essay, exam, speech, project, etc.):

☐ **Portfolio.** Please attach sample instructions/activities/etc. for the relevant portions of the portfolio submission in an appendix. Briefly describe how the results of this assessment are broken down in a way that leads to nuanced information about the aspect of the core outcome that is being investigated:

☐ **Survey**

☐ **Interview**

☒ **Other.** Please attach the activity/assessment in an appendix. If the activity cannot be shared, please briefly describe: **The Math LAS is interested in student placement into math classes and subsequent rates of success (passing). Our project may thus fall under an exploratory project. We have contacted the Office of Institutional Effectiveness and will be collectiong data on all students in the last 4-5 years for their first math class taken at PCC. We will investigate where students placed, what determined their placement (COMPASS score, SAT/ACT, etc), if they succeeded (passed) and if they succeeded (passed) in subsequent classes.**

In the event publically sharing your assessment documents will compromise future assessments or uses of the assignment, do not attach the actual assignment/document. Instead, please give as much detail about the activity as possible in an appendix.

*2B. How will you score/measure/quantify student performance?*

☐ **Rubric** (used when student performance is on a continuum - if available, attach as an appendix – if in development - attach to the completed report that is submitted in June)

☐ **Checklist** (used when presence/absence rather than quality is being evaluated - if available, attach as an appendix – if in development - attach to the completed report that is submitted in June)

☒ **Trend Analysis** (often used to understand the ways in which students are, and are not, meeting expectations; trend analysis can complement rubrics and checklist)

☐ **Objective Scoring** (e.g., Scantron scored examinations)

☐ **Other** – briefly describe:

*2C. Type of assessment (select one per column)*

☒ Quantitative  
☐ Qualitative

☐ Direct Assessment  
☐ Indirect Assessment

If you selected 'Indirect Assessment', please share your rationale:

**Qualitative Measures:** projects that analyze in-depth, non-numerical data via observer impression rather than via quantitative analysis. Generally, qualitative measures are used in exploratory, pilot projects rather than in true assessments of student attainment. Indirect assessments (e.g., surveys, focus groups, etc.) do not use measures of direct student work output. These types of assessments are also not able to truly document student attainment.

*2D. Check any of the following that were used by your SAC to create or select the assessment/scoring criteria/instruments used in this project:*

- ☒ Committee or subcommittee of the SAC collaborated in its creation  
☐ Standardized assessment  
☐ Collaboration with external stakeholders (e.g., advisory board, transfer institution/program)  
☐ Theoretical Model (e.g., Bloom's Taxonomy)  
☐ Aligned the assessment with standards from a professional body (for example, The American Psychological Association Undergraduate Guidelines, etc.)  
☐ Aligned the benchmark with the Associate's Degree level expectations of the Degree Qualifications Profile  
☐ Aligned the benchmark to within-discipline post-requisite course(s)  
☐ Aligned the benchmark to out-of-discipline post-requisite course(s)  
☐ Other (briefly explain: )

*2E. In which quarter will student artifacts (examples of student work) be collected? If student artifacts will be collected in more than one term, check all that apply.*

☐ Fall ☐ Winter ☐ Spring ☒ Other (e.g., if work is collected between terms)

*2F. When during the term will it be collected? If student artifacts will be collected more than once in a term, check all that apply.*

☐ Early ☐ Mid-term ☐ Late ☒ n/a

*2G. What student group do you want to generalize the results of your assessment to? For example, if you are assessing performance in a course, the student group you want to generalize to is 'all students taking this course.'*

We want to generalize the results of our assessment / exploration to all groups of students that are able to place into a math class via Compass, SAT / ACT scores, or prior college coursework. The courses students are able to place into are: Math 20, 60, 70, 95, 105, 111, 112, 243 and 251.

*2H. There is no single, recommended assessment strategy. Each SAC is tasked with choosing appropriate methods for their purposes. Which best describes the purpose of this project?*

- ☐ To measure established outcomes and/or drive programmatic change (proceed to section H below)
- ☐ To participate in the Multi-State Collaborative for Learning Outcomes Assessment
- ☒ Preliminary/Exploratory investigation (consult with an LAC coach prior to making this selection since most assessment projects should not qualify as preliminary/exploratory)

If you selected 'Preliminary/Exploratory' (most often a 'pilot study'), briefly describe why you opted to do a pilot study, along with your rationale for selecting your sample of interest (skip section H below). For example: "The SAC intends to add a Cultural Awareness outcome to this course in the upcoming year. It is not currently taught in most sections of this course. 2 full-time faculty and 1 part-time faculty member will field-test 3 different activities/assessments intended to measure student attainment of this proposed course outcome. The 3 will be compared to see which work best."

The PCC Math department has worked throughout the last academic year to create a new math pathways sequence for Non-STEM students, Math 58 and 98. In the very near future, it is highly likely that the Math department will do an assessment comparing Math 58 vs Math 60. Trying to assess Math 58 this academic year, which is the first time it will be offered, seemed unrealistic. As such, offering a new Math class meant there would be a new option for students to place into.

The Math department has long been interested in whether the COMPASS test is sufficient for placing students into a Math class, whether too high or too low. There has also been interest in if scores on the COMPASS have any indication of student success in the class they are placed or in future classes. Additionally, we'd like to look into indication of student success based on all 3 placement methods: prerequisite coursework, COMPASS, and SAT/ACT.

Our goal is to explore any trends that may exist for student success in our classes depending on how they were placed.

*2I. Which will you measure?*

- ☒ the population (all relevant students – e.g., all students enrolled in all currently offered sections of the course)
- ☐ a sample (a subset of students)

If you are using a sample, select all of the following that describe your sample/sampling strategy (refer to the Help Guide for assistance):

- ☐ Random Sample (student work selected completely randomly from all relevant students)

- ☐ **Systematic Sample** (student work selected through an arbitrary pattern, e.g., 'start at student 7 on the roster and then select every 5<sup>th</sup> student following'; repeating this in all relevant course sections)
- ☐ **Stratified Sample** (more complex, consult with an LAC coach if you need assistance)
- ☐ **Cluster Sample** (students are selected randomly from meaningful, naturally occurring groupings (e.g., SES, placement exam scores, etc.))
- ☐ **Voluntary Response Sample** (students submit their work/responses through voluntary submission, e.g., via a survey)
- ☐ **Opportunity/Convenience Sample** (only a few instructors are participating in a project taught via multiple sections, so, only those instructors' students are included)

The last three options in bolded red have a high risk of introducing bias. If your SAC is using one or more of these sample/sampling strategies, please share your rationale:

**2J. Briefly describe the procedure you will use to select your sample (including a description of the procedures used to ensure student and instructor anonymity. For example:**

*"We chose to use a random sample. We asked our administrative assistant to assist us in this process and she was willing. All instructors teaching course XXX will turn-in all student work to her by the 9<sup>th</sup> week of Winter Quarter. She will check that instructor and student identifying information has been removed. Our SAC decided we wanted to see our students' over-all performance with the rubric criteria. Our administrative assistant will code the work for each section so that the scored work can be returned to the instructors (but only she will know which sections belong to which instructor). Once all this is done, I will number the submitted work (e.g., 1-300) and use a random number generator to select 56 samples (which is the sample size given by the Raosoft sample size calculator for 300 pieces of student work). After the work is scored, the administrative assistant will return the student work to individual faculty members. After this, we will set up a face-to-face meeting for all of the SAC to discuss the aggregated results."*

Our data is being collected and aggregated by the office of Institutional Effectiveness. Some variables we will be able to access on success rate will be based on; gender, ethnicity, COMPASS score, SAT/ACT score, previous coursework, class level placed into, performance in first math course, performance in subsequent math courses, etc. Any student data or analysis received from Institutional Effectiveness will include student anonymity.

**2K. Follow this link to determine how many artifacts (samples of student work) you should include in your assessment:** <http://www.raosoft.com/samplesize.html> (see screen shot below). **Estimate the size of the group you**



*will be measuring (either your sample or your population size [when you are measuring all relevant students]). Often, this can be based on recent enrollment information (last year, this term, etc.):*

We are currently waiting on the needed data file from the Office of Institutional Effectiveness, but we think there will be at least a sample size of 10,000 students.

**Raosoft® Sample size calculator**

What margin of error can you accept?  
5% is a common choice

What confidence level do you need?  
Typical choices are 90%, 95%, or 99%

What is the population size?  
If you don't know, use 20000

What is the response distribution?  
Leave this as 50%

Your recommended sample size is

10 %

90 %

105

50 %

42

The margin of error is the amount of error that you can tolerate. If 90% of respondents answer yes, while 10% answer no, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. **Use 10% and 90% in these boxes.**

Lower margin of error requires a larger sample size.

Confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer yes would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. **Enter the total number of students currently enrolled in all sections of the courses you are assessing here.**

Higher confidence level requires a larger sample size.

How many people are there to choose your random sample from? The sample size doesn't change for populations larger than 20,000.

For each question, what do you expect the results will be? If the sample is skewed highly one way or the other, the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing. **Measure this many students.**

This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

### 3. Project Mechanics

3A. Does your project utilize a rubric for scoring? ☐ Yes ☒ No

If 'No', proceed to section B. If 'Yes', complete the following.

Multiple raters should always be used in SAC assessment projects that utilize rubrics or checklists. SACs have several options for ensuring that ratings are similar across each rater. The most time consuming option is for all raters to collectively rate and discuss



each artifact until they reach 100% agreement on each score (this is called **consensus**). In most cases, SACs should consider a more efficient strategy that divides the work (a norming or calibrating session). During a norming session, all raters participate in a training where the raters individually score pre-selected student work and then discuss their reasons for giving the scores they chose. Disagreements are resolved and the process is repeated. When the participants feel they are all rating student work consistently, they then independently score additional examples of student work in the norming session (often 4-6 artifacts). The ratings for these additional artifacts are checked to see what percentage of the scores are in agreement (the standard is 70% agreement or higher). When this standard is reached in the norming session, the raters can then divide-up the student work and rate it independently. If your SAC is unfamiliar with norming procedures, see the contact [Michele Marden](#) to arrange for coaching help for your SAC's norming session.

*Which method of ensuring consistent scoring (inter-rater reliability) will your SAC use for this project?*

☐ **Agreement** – the percentage of raters giving each artifact the same/similar score in a norming session

If you are using agreement, describe your plan for conducting the “norming” or “calibrating” session:

☐ **Consensus** - all raters score all artifacts and reach agreement on each score

Though rarely used at PCC, some SACs might occasionally use the consistency measure for determining the similarity of their ratings. Consistency is generally only recommended when measuring student improvement – not for showing outcome attainment (which explains its rarity). See the Help Guide for more information. Check here if you will be using consistency calculations in this assessment.

☐ **Consistency\*** – raters' scores are correlated: this captures relative standing of the performance ratings - but not precise agreement – and then briefly describe your plan:

*3B. Have performance benchmarks been specified?*

The fundamental measure in educational assessment is the number of students who complete the work at the expected/required level. We are calling this SAC-determined performance expectation the ‘benchmark.’

☐ **Yes** (determined by faculty consensus – all instructors who currently teach the course)

☐ **Yes** (determined by only some of the instructors who currently teach the course)

☐ **Yes** (determined by alignment with an external standard: e.g., standards published by the discipline's professional organization)

- ☐ **Yes** (determined by post-requisite course expectations within PCC)  
☐ **Yes** (determined by post-requisite course expectations for transfer institution)  
☒ **Yes** (other). Describe briefly: Vaguely, we are mainly interested in pass rates and how they correspond with class placement and COMPASS scores or other forms of placement.  
☐ **No**

If yes, briefly describe your performance benchmarks, being as specific as possible (if needed, attach as an appendix):

If no, what is the purpose of this assessment (for example, this assessment will provide information that will lead to developing benchmarks in the future; or, this assessment will lead to areas for more detailed study; etc.)?

The purpose would slightly depend on the results. If we see results showing that COMPASS scores are not an effective way of placement for or class, it may encourage to change cut off scores for or class or focus more resources on certain classes or create more tools available to students to use before trying to place into a mathematics class.

**3C. The purpose of this assessment is to have SAC-wide evaluation of student work, not to evaluate a particular instructor or student. Before evaluation, remove identifying student information (and, when possible remove instructor identifying information). If the SAC wishes to return instructor-specific results, see the Help Guide for suggestions on how to code and collate. Please share your process for ensuring that all identifying information has been removed.**

All of our data will come from the Office of Institutional Effectiveness, there will be no data to return to instructors and the entire SAC will have access to all the data if needed.

**3D. Will you be coding your data/artifacts in order to compare student sub-groups?** ☒ **Yes** ☐ **No**

If yes, select one of the boxes below:

☐ **student's total earned hours**
☒ **previous coursework completed**
☒ **ethnicity**
☐ **other**

Briefly describe your coding plan and rationale (and if you selected 'other', identify the sub-groups you will be coding for:

As mentioned earlier, our data will have subgroups such as success rate by method of placement, gender, ethnicity, or level of first class taken. We hope to compare all of these and look for trends.

**3E. Ideally, student work is *evaluated* by both full-time and adjunct faculty, even if students being assessed are taught by only full-time and/or adjunct faculty. Further, more than one rater is needed to ensure inter-rater**

*reliability. If you feel only one rater is feasible for your SAC, please consult with an LAC coach prior to submitting your plan/conducting your assessment.*

Other groups may be appropriate depending on the assessment. Check all that apply.

- ☒ PCC Adjunct Faculty within the program/discipline
- ☒ PCC FT Faculty within the program/discipline
- ☐ PCC Faculty outside the program/discipline
- ☐ Program Advisory Board Members
- ☐ Non-PCC Faculty
- ☐ External Supervisors
- ☐ Other:

***End of Planning Section – Complete the remainder of this report after your assessment project is complete.***

***Beginning of End of Year Reporting Section – complete the following sections after your assessment project is complete.***

***4. Changes to the Assessment Plan***

*Have there been changes to your project since you submitted the planning section of this report?* ☐ **Yes** ☐ **No**

*If so, note the changes in the planning section above.*

***5. Results of the Analysis of Assessment Project Data***

***5A. Quantitative Summary of Sample/Population***

*How many students were enrolled in all sections of the course(s) you assessed this year?*

*If you did not assess in a course, report the number of students that are in the group you intend to generalize your results to.*

*How many students did you actually assessed in this project?*

*Did you use a recommended sample size (see the Sample Size Calculator linked to above)?* ☐ **Yes** ☐ **No**

*If you did not use a recommended sample size in your assessment, briefly explain why:*

***5B. Did your project utilize a rubric for scoring?*** ☐ **Yes** ☐ **No**

*If 'No', proceed to section C. If 'Yes', complete the following.*

*How was inter-rater reliability assured?*

☐ **Agreement** – the percentage of raters giving each artifact the same/similar score in a norming session

- ☐ **Consensus** - all raters score all artifacts and reach agreement on each score
- ☐ **Consistency** – raters’ scores are correlated: this captures relative standing of the performance ratings - but not precise agreement
- ☐ **Inter-rater reliability was not assured.**

*If you utilized agreement or consistency measures of inter-rater reliability, report the level here:*

### 5C. Brief Summary of Your Results

*In most cases, report the numbers of students who attain your benchmark level and the numbers who do not. **Do not average these numbers or combine dissimilar categories (e.g., do not combine ratings for communication and critical thinking together).** If your project measures how many students attain the overall benchmark level of performance, report the summary numbers below (choose one):*

- 1. If you used frequencies (the actual number who attained the desired level(s) and the actual number who did not), report those here for each of your criteria for this learning outcome. For example, “46 students attained the benchmark level over-all in written communication and 15 did not. Our SAC used 5 criteria within this rubric: 46 student achieved the benchmark level in idea expression (15 did not); 54 achieved the benchmark level for use of standard English (10 did not); etc.”*
- 2. If your project used percentages of the total to identify the degree of benchmark attainment in this project, report those here for each of your criteria for this learning outcome. For example, “75% of 61 students attained the benchmark level over-all in written communication. Our SAC used 5 criteria within this rubric: 75% of students achieved the benchmark level in idea expression; 89% achieved the benchmark level for use of standard English; etc.”*

5D. Attach a more detailed description or analysis of your results (e.g., rubric scores, trend analyses, etc.) as an appendix to this document. Appendix attached? ☐ Yes ☐ No

5E. What did the SAC learn about your students' attainment of your important benchmarks from this assessment? For example, "We are pleased that most of our students are using standard English in their writing, but want to improve our students' ability to express ideas clearly...."

5F. Do the results of this project suggest that academic changes might be beneficial to your students (changes in curriculum, content, materials, instruction, pedagogy etc.)? ☐ Yes ☐ No

If you answered 'Yes,' briefly describe the changes to improve student learning below. If you answered 'No', detail why no changes are called for.

If you are planning changes, when will these changes be fully implemented?

5G. Has all identifying information been removed from your documents? (Information includes student/instructor/supervisor names/identification numbers, names of external placement sites, etc.) ☐ Yes ☐ No

## 6. SAC Response to the Assessment Project Results

6A. Assessment Tools & Processes: Indicate how well each of the following worked for your assessment:

Tools (rubrics, test items, questionnaires, etc.):

☐ very well ☐ some small problems/limitations to fix ☐ notable problems/limitations to fix ☐ tools completely inadequate/failure

Please comment briefly on any changes to assessment tools that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome).

*Processes (faculty involvement, sampling, norming, inter-rater reliability, etc.):*

☐ very well   ☐ some small problems/limitations to fix   ☐ notable problems/limitations to fix   ☐ tools completely inadequate/failure

*Please comment briefly on any changes to assessment process that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome).*

## 7. Follow-Up Plan

*7A. How will the changes detailed in this report be shared with all FT/PT faculty in your SAC? (select all that apply)*

☐ email   ☐ phone call   ☐ workshop  
☐ campus mail   ☐ face-to-face meeting   ☐ other  
☐ no changes to share

*If 'other,' please describe briefly below.*

*7B. Is further collaboration/training required to properly implement the identified changes?*   ☐ Yes   ☐ No

*If 'Yes,' briefly detail your plan/schedule below.*

*7C. Re-assessment is a critical part of the overall assessment process. This is especially important if academic changes have been implemented. How will you assess the effectiveness of the changes you plan to make?*

☐ follow-up project in next year's annual report   ☐ on-going informal assessment



☐ *in a future assessment project*

☐ *other*

*If 'other,' please describe briefly below.*

*7D. SACs are learning how to create and manage meaningful assessments in their courses. This development may require SAC discussion to support the assessment process (e.g., awareness, buy-in, communication, etc.). Please briefly describe any successful developments within your SAC that support the quality assessment of student learning. If challenges remain, these can also be shared.*