

Subject Area Committee Name: Geography

Outcome Being Assessed: Professional Competence

Contact Person

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This form is for the initial assessment of a core outcome.

- Refer to the help document for guidance in filling-out this report. If this document does not address your question/concern, contact [Wayne Hooke](#) 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_2016 (Example: MTH_ARF_2016)
- SACs are encouraged to share this report with their LAC coach for feedback before submitting.
- Make all submissions to learningassessment@pcc.edu.

Due Dates:

- **Planning Sections of LAC Assessment or Reassessment Reports: November 28th, 2016**
- **Completed LAC Assessment or Reassessment Reports: June 16th, 2017**

Please Verify This Before Beginning this Report:

This project is not the second stage of the assess/reassess process (if this is a follow-up, re-assessment project, use the LAC Re-assessment Report Form LDC. Available [here](#).)

1. Outcome

1A. PCC Core Outcome: Professional Competence

1B. How does your discipline interpret the outcome you are assessing?

An ability to provide correct responses on a multiple-choice knowledge survey of technical and spatial questions related to Geographic Information Systems (GIS), specifically compared to length of GIS experience prior to and near completion of a PCC GIS Certificate.

1C. Briefly describe how this outcome is/might be important/useful to your students.

Professional competence, specifically regarding technical software proficiency and spatial reasoning, is particularly useful in the GIS field. Many of the students' desires to advance their academic or professional careers is significantly dependent upon their specific technical knowledge of GIS software, as well as their general ability to solve spatial problems.

2. Project Description

2A. Assessment Context

Check and complete all the applicable items:

Course-based assessment.

Course names and number(s):

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:

In the event publicly 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. Note that the **use of a numerical rubric is considered quantitative analysis**, even if the artifacts under consideration are not based on quantitative calculations (e.g. an essay scored by a rubric counts as quantitative in the context of assessment).

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 (samples 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. 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.'

The results will be generalized to students enrolled in GIS classes at PCC, which will include two comparisons: (1) GIS knowledge as compared with length of GIS experience near the beginning of the 2-year GIS Certificate program, and (2) GIS knowledge as compared with length of GIS experience near the end of the 2-year GIS Certificate program.

2G. 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
 To participate in the Multi-State Collaborative for Learning Outcomes Assessment
 Preliminary/Exploratory investigation

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 sampling method:

The 2016-2017 Geography assessment is a preliminary attempt to introduce and standardize annual introductory and exit assessments in the 2-year GIS Certificate program, in order to measure the level of GIS knowledge of students entering the program as compared with the level of GIS knowledge achieved near the end of the 2-year program. This comparison, in turn, provides evidence of GIS proficiency and spatial reasoning ability, as well as general preparedness for continued academic or professional work.

The sampling method is to assess students during Winter and Spring terms in the 2016-2017 year (potentially adjusted to Fall and Spring terms in 2017-2018). Winter term classes without GIS prerequisites will be selected, the results of which will be compared with assessment results from Spring term classes that do have GIS prerequisites and are positioned to be taken near the end of the 2-year GIS Certificate program. The sampling method based on GIS prerequisites and position in the GIS Certificate curriculum will insure that a comparison is occurring between students that are near the beginning of their certification with students near completion.

2H. 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 5th 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:

2I. Briefly describe the procedure you will use to select your sample (including a description of the procedures used to ensure student and instructor anonymity).

All students in GEO 246 and 265 will be assessed in Winter term, and two classes with GIS prerequisites will be selected in Spring term. The assessment will be administered on D2L via a mandatory, anonymous, multiple-choice survey. Instructor anonymity will be insured by collecting only data relevant to term and year (rather than course number), as well as by deriving results only after all surveys have been aggregated and randomized at the end of spring term.

2J. 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).

Start with the number of students you estimate will be enrolled in the course(s) from which you will draw the sample – that is your “population.” Enter the other numbers as indicated in the screenshot. The sample size calculator will tell you how many artifacts you need to collect. Enter that number below:

Approximately 110 students will be sampled Winter and Spring term (i.e., two classes each term), which will require completed

assessments from approximately 85 students.

Raosoft Sample size calculator

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

10 %

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. Lower margin of error requires a larger sample size. **Use 10% and 90% in these boxes.**

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

90 %

The 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. Higher confidence level requires a larger sample size. **Enter the total number of students currently enrolled in all sections of the courses you are assessing here.**

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

105

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

What is the response distribution?
Leave this as 50%

50 %

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.**

Your recommended sample size is

42

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:

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; ideally, that will be 75% agreement or greater.

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

Notes: the agreement method is the most frequently used for assessment, but the **calculation of inter-rater reliability is also among the more challenging issues** within assessment as a whole. If your SAC is unfamiliar with norming procedures, contact your assessment coach, or if you don’t know who your coach is, contact LAC Vice Chair [Chris Brooks](#) to arrange for coaching help for your SAC’s norming session.

The consistency method is not generally recommended; see the help guide for details.

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**
- 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 of the entry assessment (Winter term 2016-2017, Fall term 2017-2018, in GIS courses without GIS prerequisites) is to establish a baseline for technical GIS knowledge of students when entering the GIS Certificate program and taking GIS courses that do not have GIS prerequisites. The exit assessment (Spring term 2016-2017 and 2017-2018, in GIS courses with specific GIS prerequisites) is designed to measure the level of technical GIS knowledge achieved over the course of the program.

Since the 2016-2017 standardized pre/post assessment for the GIS Certificate program is designed to be a pilot study for the potential annual use of pre/post assessments in following years, specific benchmarks have not yet been specified. A tentative minimum benchmark for the exit assessment is to have less than 5% of sampled students achieve less than 80% correct responses.

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 student-identifying information (and, when possible remove instructor-identifying information). **Please share your process for ensuring that all identifying information has been removed.**

Using D2L's anonymous survey functionality will insure that student information is not attached. The only general non-GIS information that will be collected is (1) an ordinal self-assessment of length of GIS experience, and (2) term and year of assessment.

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):

Ordinal self-assessment of length of GIS experience: (a) less than 3 months, (b) 3 - 6 months, (c) 6 - 12 months, (d) greater than 12 months.

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.

Who will be assessing student work for this project? 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

Were there changes to your project since you submitted the planning section of this report? Yes No

If so, note the changes below:

5. Narrative

Broadly, what did your SAC learn from the assessment of the core outcome under consideration this year?

Broadly speaking, we learned that, over the course of their tenure at PCC, GIS students appear to be successfully internalizing and recalling technical GIS skills required in the professional workforce.

More specifically, we tentatively confirmed our hypothesis that GIS experience positively correlates with performance on skills-based tests. Tentatively, again, we learned that specific GIS experience at PCC appears to have a stronger correlation with performance on skills-based tests than general GIS experience (i.e., GIS experience of which the source is not specified).

The measurement for this comparison is Spearman's rank correlation. The correlation for general or unspecified GIS experience is 0.8. The correlation for PCC-specific GIS experience is 1.0, which shows that each of the five self-assigned ordinal rankings of experience (from least to most) is accompanied by an increase in assessment performance.

The reason for the phrasing of findings as "tentative," is that it appears that the sample size was not sufficient to garner precise enough margins of error in order to confidently differentiate the group performance of students based on ordinal experience-based rankings.

6. Results of the Analysis of Assessment Project Data

6A. Quantitative Summary of Sample/Population

How many students were enrolled in all sections of the course(s) you assessed this year? 98

(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 assess in this project? 78

Did you use a recommended sample size (see the Sample Size Calculator linked to in section 2J)? Yes No

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

6B. 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? (If help is needed calculating inter-rater reliability, please contact your SAC's LAC coach.)

- 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:

6C. Brief Summary of Benchmark Achievement (frequencies and/or averages)

1. *If you used frequencies of benchmark achievement, report those here. For example, "46 students attained or exceeded the benchmark level in written communication and 15 did not." If necessary, provide detailed results in an appendix.*
2. *If you used percentages of the total to identify the degree of benchmark attainment in this project, report those here. For example, "75% of 61 students attained or exceeded the benchmark level over-all in written communication."*

We used this year's assessment (year 1 of 2) to help establish benchmarks. That said, our tentative (albeit somewhat arbitrary) benchmark was to have less than 5% of the students achieve less than 80% correct responses on the skills-test. This tentative benchmark was not phrased precisely enough to be meaningful.

Taken literally, the average score for all 78 students (i.e., 81 responses altogether with three students repeating the assessment in consecutive terms) was only 57%, and 84% of students achieved less than 80% correct responses. However, the benchmark should be framed relative to only students who are near the end of their certificate program and would have answered (d) on question 2 (i.e., having completed 4 or more PCC GIS classes), since the goal of the assessment is to determine whether or not the curriculum and pedagogical approach is effective.

With that in mind, the 21 students with the most PCC GIS experience averaged 75% on the assessment, and 52% achieved less than 80% correct responses.

Aside from the tentative benchmark being somewhat vague in its phrasing, there were other aspects of the assessment that lessened the ability or motivation of students to perform as well as possible in an otherwise ideal "testing" environment: (1) the assessment was unscheduled (i.e., the student was unable to prepare), (2) the specific instructions for the students were to skip questions they were not confident answering (so as to avoid random selections of correct responses), (3) the students were simply provided with a participation grade, rather than a performance grade, and (4) a subset of 7 of the 16 questions were chosen from intermediate or advanced GIS certification exams, which in some instances may require an assumption of knowledge that is not expected of students completing the certificate program. One of the benefits, however, of including the more difficult questions is to help instructors understand where it might be useful to dedicate increased attention in future lectures and labs.

A primary area of improvement would be to re-think the benchmark, either by reducing the overall benchmark (and of course adjusting the focus to advanced students) or conceptually adjusting the benchmark to measure specifically the improvement over time of individual students who take the assessment at or near the beginning as well as at or near the end of the certificate program.

For example, three students repeated the assessment in consecutive terms and showed an average improvement of 10%. A sample of three is too small to be statistically significant, but anectdotally suggests an improvement due to increased academic experience, since post-assessment grades were not provided.

6D. If possible, 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**

6E. 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.

Five questions seemed to provide significant difficulty to students (i.e., less than 50% of students provided correct responses), and would suggest increased attention on the following subjects: (1) the use of ModelBuilder as one of the primary methods of tool creation via connected strings of geoprocessing operations, (2) the types of data formats required for versioning (e.g., the ability of multiple users to edit simultaneously), (3) associated parallel functions or workflows (e.g., ability to rename layers from the vantage point of different interfaces), (4) label customization (especially regarding the many nested interfaces in ArcMap), and (5) coordinate systems and projections (or the lack thereof).

The fact that the assessment is given both to beginner and more advanced classes, however, suggests that some of these areas (e.g., ModelBuilder) are being effectively covered in later courses. Three questions seemed to provide significant difficulty to experienced or advanced students, which included issues related to the aforementioned (1) versioning and (2) coordinate systems, as well as (3) the ability to identify the correct symbology (i.e., dot density, proportional symbols, unique values, bar/column chart) after assessing a hypothetical use-case.

All three of the questions that proved difficult to more experienced students were selected from intermediate or advanced certification exams, and can frankly be challenging for professionals as well. The actual use-case for versioning probably wouldn't be

encountered until working at a large organization where multiple people on a single project might have the need to edit a specific file simultaneously. Coordinate systems and projections can be challenging to GIS professionals for whom a portion of their job is not specifically dedicated to the subject. Lastly, choosing an appropriate symbology for a hypothetical scenario is difficult even for a professional, since the nature of GIS work is data exploration, including exploratory data visualization (i.e., simply seeing what works by experimenting with and visualizing the data).

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

Suggested changes will be communicated to faculty by email, and incorporated into lectures and labs in the upcoming academic year, 2017-2018.

6F. *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

7. SAC Response to the Assessment Project Results

7A. *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 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).

The biggest area of improvement will be in providing an additional question in the self-identification of GIS experience, such that the existing categories of general GIS experience and PCC GIS experience can be more precisely differentiated (i.e., How many months of GIS experience did you have prior to enrolling at PCC?).

Additional improvements include:

1. A checkbox for students to identify which PCC classes they have specifically taken. We could then parse, for example, if difficulties with a particular issues are being exhibited by students who took classes which explicitly addressed those issues.
2. Specification of whether the current class is being taken as an elective or as part of the GIS certificate program.
3. Specification of previous level of academic experience, regardless of GIS experience.
4. Improving the ordinal self-assigned experience-based rankings such that each level of general (or pre-PCC) and PCC GIS experience are equivalent and comparable. As it stands now, the lowest ranking of general experience (i.e., less than 3 months) is not equivalent with the lowest ranking of PCC experience (i.e., zero classes).
5. Building on the previous example, insure that zero experience categories are present on both background questions. Students were instructed to simply provide written specification if the actual amount of previous PCC experience was zero.

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).

Increase the sample size in order to diminish the margin of error, given the significant within-group variation in results. Increasing sample size would require increasing the number of courses that are assessed. To that end, and for the general sake of logistical standardization, it would be helpful to adjust the mechanism of assessment delivery. This year it was in paper form. In subsequent years, it would be useful to implement an online survey that can be linked from email or D2L.

8. Follow-Up Plan

8A. How will the changes detailed in this report be shared with all FT/PT faculty in your SAC? (select all that apply)

- | | | |
|--|---|-----------------------------------|
| <input checked="" type="checkbox"/> email | <input type="checkbox"/> phone call | <input type="checkbox"/> workshop |
| <input type="checkbox"/> campus mail | <input type="checkbox"/> face-to-face meeting | <input type="checkbox"/> other |
| <input type="checkbox"/> no changes to share | | |

If 'other,' please describe briefly below.

8B. Is further collaboration/training required to properly implement the identified changes? Yes No

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

8C. 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.

8D. 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.

The 2016-2017 assessment marks the beginning of a two-year assessment / re-assessment cycle that is attempting to test the efficacy of standardizing pre/post assessments for the GIS certificate program. Multiple logistical and conceptual challenges were discovered along the way, many of which were roundly addressed by Geography faculty at the most recent spring SAC meeting.

Generally speaking, despite the inherent difficulties with robust standardized assessments, the faculty has voiced an interest in improving upon this pilot effort and incorporating the lessons learned for the upcoming 2017-2018 re-assessment, especially in regards to the types of background questions that will allow for more precise between-group comparisons, as well as the substance of some of the skills-based questions themselves.

