1. What student learning outcomes were assessed this year, and why?

In answering this question, please identify:
• the specific student learning outcomes that were assessed
• reasons for assessing the outcomes, with the outcomes written in clear, measurable terms
• which CWU Strategic Plan Outcome do the student learning outcomes relate to?

See: http://www.cwu.edu/strategic-planning/strategic-plan. For example:

The following learning outcomes are all assessed annually because each of these outcomes meet a Washington State Secondary Mathematics Endorsement standard or Washington State Certification Standard. They all meet the CWU Strategic Plan Outcome - 1.1.1 Students will achieve programmatic learning outcomes.

1. Graduates will be able to explain the concepts and applications of elementary functions.
2. Graduates will be able to explain the concepts of calculus to model dynamic change.
3. Graduates will be able to explain the concepts, methods, and applications of logic and discrete models.
4. Graduates will be able to apply and explain the concepts, methods, and applications of algebra systems.
5. Graduates will be able to apply and explain the concepts, methods, and applications of Euclidean and Non-Euclidean geometry using inductive and deductive approaches.
6. Graduates can plan, teach, and assess lessons concerning topics presented in Student Learning Outcomes1–5 using their understanding of mathematics, learning theory, and pedagogy.
7. Graduates can use appropriate technology to investigate and represent concepts, methods, and applications of mathematical problems. Graduates can use appropriate technology to teach and assess student understanding of mathematical concepts.
8. Graduates will be able to use the principles of mathematical thinking to solve and prove mathematical problems.
9. Graduates will be able to plan, teach, and assess lessons involving mathematical thinking using their understanding of mathematics, learning theory, and pedagogy.
10. Graduates will be able to apply and explain the historical and cultural development of each branch of mathematics to the discovery of important mathematical ideas.

2. How were the student learning outcomes assessed?
   A) What methods were used?

Concisely describe each specific method used in assessing student learning outcomes. For each assessment method specify:
- If that assessment method was direct (e.g. exams) or indirect (e.g. focus groups)
- If the assessment method assessed performance, knowledge, and/or attitudes
- The specific standard of mastery (criterion) against which you will compare your results. For example, “at least 85% of students pass the senior exit exam”

1. Outcomes 1-5 are assessed by West-E/NES exam and Livetext Portfolio (MATH 325 rubric). The NES exam is a national teacher content exam and the pass score is set by the PESB.
2. Outcomes 6-10 are assessed by the Livetext Portfolio (MATH 325 rubric). The MATH 325 rubric is aligned with the Washington State Endorsements Standards and edTPA.

B) Who was assessed?

- The population assessed
- The number of students assessed (e.g., 53)
- Survey or questionnaire response rate (if appropriate)

1. All students must take and pass the NES exam.
2. All students must complete and Livetext Portfolio (MATH 325 rubric is aligned with Washington State Endorsements Standards and edTPA).

C) When was it assessed?

- When did the assessment take place (was it at the end of the degree, as students entered the program or during a specific term?)

1. The NES exam is taken their senior year before students teaching.
2. MATH 325 Livetext Portfolio is fall of their senior year (December 10, 2014).

3. What was learned?

- Were the standards of mastery met?
- Report results in specific qualitative or quantitative terms, with the results linked to the student learning outcomes you assessed, and compared to the standard of mastery (criterion) you noted above
• Include a concise interpretation or analysis of the results

Analysis of West-E Exams for September 1, 2014 – September 1, 2015:
The West-E scores are one of the measure for SLO 1-5. One of the changes resulting in lower West-E scores is the test has changed to the NES exam. The test has changed in format and difficulty. The pass-rate of first time passers 56.3%. The average score for all attempts was 218.3 (220 is passing) this average is above the state institutional average. The break down for each teacher candidate is 9 passed first time, 2 on second attempt, 1 on third attempt, and 4 are still in the process of taking 1st, 2nd, or 3rd attempt. Below is the break down for the test averages by test domain.

<table>
<thead>
<tr>
<th>Domain</th>
<th>MP &amp; NS</th>
<th>Patterns, Algebra, &amp; Functions</th>
<th>Geometry &amp; Measurement</th>
<th>Trig &amp; Calculus</th>
<th>Statistics, Prob &amp; Discrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Correct</td>
<td>60.4</td>
<td>66.4</td>
<td>58.3</td>
<td>56.1</td>
<td>52.3</td>
</tr>
</tbody>
</table>

The West-E scores and pass-rate do not meet the program standards. The domain averages of Geometry and Measurement, Trigonometry and Calculus, and Statistics, Probability, and Discrete Math are all below 60%. If the averages of all domains were at 60% the average score of the West – E would be slightly above 250.

Analysis of the Livetext Portfolio for September 1, 2014 – September 1, 2015:
The electronic Livetext Portfolio has also changes because the state WACs have changed with respect to content, pedagogy, and field-experience standards. The existing outcomes still align with the pedagogy and content outcomes. The main change in standards is that there are main more indicators that measure pedagogy and the teacher candidates are required to be with a classroom teacher for 160 hours before student teaching. Below are the measurements for the indicators of pedagogy (SLO 6-10) and content (SLO 1-5) proficiency. Notice the average for all measures of general and mathematical pedagogy are 3 or higher. The last item (Mathematical Content) is a measure of their ability to teach each of the standard domains and it is a level 4. Therefore, all the standards measured by the Livetext Portfolio indicate that the teacher candidates are at or above standard.

In addition, the average field-experience hours for a teacher candidate in the teaching mathematics program was 168 hours. This exceeds the state requirement by an average of 8 hours per candidate.
4. What will the department or program do as a result of that information?

- Note specific changes to your program as they affect student learning, and as they are related to results from the assessment process
- If no changes are planned, please describe why no changes are needed
- In addition, how has/will the department report the results and changes to internal and/or external constituents (e.g., advisory groups, newsletters, forums, etc.)

To address the low West-E scores the mathematics education faculty has submitted changes to four math courses. These changes are to ensure that teacher candidates take the courses in the correct order to improve the learning in the courses. Also the lower level math content review (most of the West-E exam is math content the teacher candidates studied more than two year prior) has been moved earlier in the program to identify students who need more review before their senior year.

In addition program reports from the mathematics education faculty meeting are available. The Mathematics education faculty usually meets 3 times a year (Nov. 2015, April 2016, and Oct. 2016) to review data, make recommendations for improvement, and collaborate in professional development activities.
5. What did the department or program do in response to previous years' assessment results, and what was the effect of those changes?

- Describe any changes that have been made to improve student learning based on previous assessment results
- Were those changes effective?
- Discuss any changes to your assessment plan or assessment methods

1. The mathematics faculty has been very active in designing and implementing a marketing plan for the recruitment of math teacher candidates. We have re-designed our department and program webpages to focus on recruitment rather than information. We also have designed and printed rack cards to advertise the teaching secondary and middle level math programs both for the Ellensburg campus and west-side campuses. We want and need a marketing plan with a budget to target all high school and community college students with the message, "If you want to teach math then Central is for you."

2. The CTL and mathematics department need more resources to collaborate and ensure that all field experiences are well organized and evaluated. As you can see the placement of teacher candidates into diverse classrooms was achieved but with more resources. We could ensure collaboration between the school districts, math department, and field experience office (PEP).

3. The proposed curriculum and policy changes are:
   a. Give all math teacher candidates who are fully admitted to the program a 2 credit on-line courses that would, (a) familiarize them with the content on the NES test; (b) complete a sample NES exam to assess areas of math content weakness and strengths; (c) study 1 or 2 weak math content areas; and (d) re-take a sample NES exam.
   b. If a teacher candidate does well on the sample NES exam they will be advised to take the NES exam and if not they will be required to take an additional 2-credit multi-platform support course to address their specific content knowledge weaknesses. The budgetary needs of this program would be an instructor for two 2-credit courses. The first course would pay for itself in tuition from the teacher candidates but the 2nd support course would probability only have an enrollment of only 3 to 4 teacher candidates. Also, the mathematics education faculty propose that the department purchase the sample NES exams at $5 per exam instead of passing this cost onto the teacher candidates. We feel that the teacher candidates already pay approximately $800 more than other CWU students in test and CWU fees and that this support will help create access to becoming a math teacher. There is a shortage of math teachers, which is becoming a crisis.

4. The mathematics department needs another mathematics education tenure-track position, because of the increased of accreditation requirements. Also, the number
of math education courses being taught by math lectures has increased by over 20 credit hours in the past year.

5. Our program requirement of an extra 150 hours of field experience teaching before student teaching is now required of all teacher education program in the state of Washington. This change in math education programs and others previous mention require more and different faculty work loads. The 5 math education faculty members are responsible for over 900 contact hours per year for the mathematics courses over 40 secondary math teacher candidates, 50 middle level math teacher candidates, and 200 elementary education teacher candidates (both at the Ellensburg and Des Moines campuses). The math education faculty also teaches general math courses also. We have some of these courses taught by lectures but the curriculum, accreditation reports, and advising must the tenure track faculty do all. We need at least one more tenure track faculty member for math education, if one of the members became sick or wanted to take a sabbatical it would be impossible to meet the math teaching and administrative load required for these programs. This seems like an easy sell to the legislature and governor since there is an extreme math teacher shortage.

6. Questions or suggestions? Contact Tom Henderson (henderst@cwu.edu) or Bret Smith (bpsmith@cwu.edu)