Central Washington University
Assessment of Student Learning
Department and Program Report

Academic Year of Report: 2009-2010
College: Sciences
Department Geological Sciences
Program: BS, BA Geology, BS Environmental Geological Sciences

1. What student learning outcomes were assessed this year, and why?
In answering this question, please identify the specific student learning outcomes you assessed this year, reasons for assessing these outcomes, with the outcomes written in clear, measurable terms, and note how the outcomes are linked to department, college and university mission and goals.

The department assessed Student Learning Outcomes #1, 2, 3, 4, 5, and 6. The specific learning outcomes are delineated in the accompanying plan, as are the links to department, college and university mission and goals.

2. How were they assessed?
In answering these questions, please concisely describe the specific methods used in assessing student learning. Please also specify the population assessed, when the assessment took place, and the standard of mastery (criterion) against which you will compare your assessment results. If appropriate, please list survey or questionnaire response rate from total population.

**Learning Outcome #1:** Assessed through evaluation of an assignment given in the following required or elective classes:
- GEOL 445 (n = 5 undergraduate majors, 100% response)
- GEOL 386 (n = 34 undergraduate majors, 100% response rate)
- GEOL 495 (n = 11, based on class grade so 100% response rate).

**Learning Outcome #2:** Assessed through evaluation of an assignment given in the following required or elective classes:
- GEOL 434 (n = 6 undergraduate majors, 100% response rate)
- GEOL 495 (n = 11 undergraduate majors, based on class grade so 100% response rate)

**Learning Outcome #3:** Assessed through evaluation of an assignment given in the following required or elective classes:
- GEOL 200 (n = 40 undergraduate majors, response rate 100%)
- GEOL 434 (n = 6 undergraduate majors, 100% response rate)

**Learning Outcome #5:** Assessed through evaluation of an assignment given in the following required or elective classes:
- GEOL 346 (n = 13 undergraduate majors, variable response rate; some of the students did not complete the assignment.)
- GEOL 434 (n = 6 undergraduate majors, 100% response rate)
**Learning Outcome #6:** Assessed through evaluation of a competency test given in GEOL 487 (n = 17 undergraduate majors, 100% response rate), the capstone class required for all BA and BS students except those in the Earth Science major. These students have a separate capstone class.

For additional details, please refer to the attached CWU Student Learning Outcome Assessment Plan.

A) **What methods were used?**
(1) Specific rubrics were created to grade assignments that addressed one or more learning objectives. Instructor or teaching assistant completed rubric evaluation. Evaluation of assignments and rubrics was completed by chair.

(2) For competency test (learning outcome #6), test was administered by the instructor. Scantron results were provided by testing services. Chair reviewed and summarized results.

(3) For 495, results (grades) were compiled and evaluated by chair.

B) **Who was assessed?**
All of the students in a specific class, or in relevant cases, students enrolled in GEOL 495 were assessed.

C) **When was it assessed?**
Learning objectives were assessed during the relevant quarter that the class was delivered.
Fall: GEOL 200, GEOL 346, GEOL 445, GEOL 487
Winter: GEOL 434, GEOL 386
Spring: GEOL 434, GEOL 386

GEOL 495 is offered fall, winter, and spring quarters.

3. **What was learned?**
In answering this question, please report results in specific qualitative or quantitative terms, with the results linked to the outcomes you assessed, and compared to the standard of mastery (criterion) you noted above. Please also include a concise interpretation or analysis of the results.

**RESULTS**

Several criteria for assessment of specific learning objectives identify a target of 85% of students receiving an average rubric score of 2 or greater. These are reported below.

<table>
<thead>
<tr>
<th>Learning Objective, Course #</th>
<th>n</th>
<th>Below rubric average of 2*</th>
<th>Above rubric average of 2</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, GEOL 386</td>
<td>34</td>
<td>0</td>
<td>34</td>
<td>Students worked in groups. Group scores between 2.1 and 3.6 (out of 4). Class rubric average was 3.2.</td>
</tr>
<tr>
<td>1, GEOL 445</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>Scores ranged from 2.3 to 3.5 (out of 4). Class rubric average was 2.8.</td>
</tr>
</tbody>
</table>
Scores ranged from 2.3 to 4 (out of 4). Class rubric average was 3.3.

Scores ranged from 3 to 4 (out of 4). Class rubric average was 3.7.

Scores ranged from 2.5 to 3.5 (out of 4). Class rubric average was 3.3.

Scores ranged from 2 to 4 (out of 4). Class rubric average was 3.1.

Scores ranged from 2.3 to 4.0 (out of 4). Class rubric average was 3.1.

*Standard of mastery for each outcome is 85% of students receive rubric score of 2 or above. Thus, for each outcome, 100% of the students achieved mastery. See learning outcome assessment plan for more detail. Rubrics on file in department.

For learning objective 6, the criterion of achievement includes 70% of students achieving a score of 75% of higher on the competency test.

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>n</th>
<th>Below 75%</th>
<th>At or above 75%</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>17</td>
<td>4</td>
<td>13</td>
<td>76% met or exceeded expectation</td>
</tr>
</tbody>
</table>

The four students who did not achieve 75% were required to re-take the exam. All passed the second time.

For learning objectives 1, 2, and 4, the criterion of achievement includes 90% of students receiving a passing grade in GEOL 495.

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>Below Passing Grade</th>
<th>At or Above Passing</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1, 2, 4</td>
<td>11</td>
<td>10</td>
<td>One student received an I.</td>
</tr>
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</table>

4. What will the department or program do as a result of that information?

In answering this question, please 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 will the department report the results and changes to internal and external constituents (e.g., advisory groups, newsletters, forums, etc.).

ANALYSIS

For all outcomes (#1 through 6), standard of mastery was achieved. Thus, the assessment results indicate that the department is achieving its objectives for student learning.

Results for learning objective 6 are acceptable. Overall, students’ knowledge of the core areas is acceptable, and no major modifications to our approach or curriculum are required. During 2009-
2010, we had program review and were also consumed with Science Phase II. As a department, we did not outline the specific core areas, but this will be a priority for 2010-2011.

Last year, students expressed desire for timely information about graduate school applications and resume building/interviewing. During fall quarter, we offered a workshop on developing an effective resume and effective interviewing skills. We also invited several employers to the department to provide information about the job market and about interviewing. In 2010-2011, we hope to add a fall quarter workshop on applying to graduate school.

Several faculty members attended a workshop on assessment with Science Education faculty. We hope to continue incorporating improvements based on that and future workshops.

**ACTION PLAN FOR ACADEMIC 2010-2011**
(1) Simplify learning objectives and assessment process. This includes systematization of rubrics.
(2) Define knowledge outcomes explicitly. They are embedded in objective 6, but we will explicitly define them in the learning objectives document.
(3) Define dispositions and include in learning objectives. Beth Pratt-Sitaula was asked to help with this aspect during academic 2009-2010 and will report to the chair sometime this (2010) summer.
(6) Offer a workshop in October: graduate school information and application preparation.

5. **What did the department or program do in response to last year’s assessment information?**
In answering this question, please describe any changes that have been made to improve student learning based on previous assessment results. Please also discuss any changes you have made to your assessment plan or assessment methods.
(1) As advised, we used rubrics that explicitly defined skills and levels of mastery. Faculty developed these, and we will continue to refine rubrics for each learning outcome.
(2) We modified the learning outcomes to address the use of rubrics.
(3) We discussed the possible use of portfolios to address assessment needs. The discussion will continue next year.
(4) We will hopefully incorporate dispositions into our outcomes and explicitly evaluate these.

6. **Questions or suggestions concerning Assessment of Student Learning at Central Washington University:**
<table>
<thead>
<tr>
<th><strong>Student Learning Outcomes (performance, knowledge, attitudes)</strong></th>
<th><strong>Related Program/ Departmental Goals</strong></th>
<th><strong>Related College Goals</strong></th>
<th><strong>Related University Goals</strong></th>
<th><strong>Method(s) of Assessment (What is the assessment?)</strong></th>
<th><strong>Who Assessed (Students from what courses – population)</strong></th>
<th><strong>When Assessed (term, dates)</strong></th>
<th><strong>Standard of Mastery/ Criterion of Achievement (How good does performance have to be?)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Present an analysis of data and interpretations orally and in a professionally written report</td>
<td>1. Students will demonstrate the knowledge, skills, and attitudes to be successful in their chosen field of geological sciences, including fundamental understanding of a variety of Earth processes and their relevance to humans. 4. Faculty, scientific staff and students will make relevant scientific contributions to the geological sciences through scientific inquiry, acquisition of external funding, local, regional and national presentations, and through a variety of types of publications and reports.</td>
<td>I: Provide for an outstanding academic and student experience in COTS</td>
<td>One: Maintain and strengthen an outstanding academic and student life on the Ellensburg campus.</td>
<td>Instructor evaluation of literature-based and original research papers, laboratory and field based research projects, oral presentations in class, laboratory, disciplinary and other meetings and in 300/400-level classes Faculty mentor evaluation of independent scholarship project</td>
<td>Undergraduates enrolled in upper division classes Undergraduates enrolled in GEOL 495</td>
<td>Fall, winter, spring quarters Fall, winter, spring quarters</td>
<td>85% of students get rubric grade of 2 or better on such assignments 90% of students enrolled receive passing grade</td>
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<tr>
<td>2) Critically interpret published scientific literature; differentiate data from interpretation</td>
<td>I</td>
<td>One</td>
<td>Instructor evaluation of literature-based and original research papers, directed reading assignments Faculty mentor evaluation of independent scholarship project</td>
<td>Undergraduates enrolled in upper division classes Undergraduates enrolled in GEOL 495</td>
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<tr>
<td>3) Interpret representations of data, including graphs, maps, cross-sections</td>
<td>1</td>
<td>1</td>
<td>One</td>
<td>Instructor evaluation of laboratory exercises, exams.</td>
<td>Undergraduates enrolled in 200, 300 and 400-level classes</td>
<td>Fall, winter, spring quarters</td>
<td>85% of students get rubric grade of 2 or better on such assignments</td>
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<td>4) Demonstrate working knowledge of standard geologic reference tools and resources, e.g. library, web, computer databases</td>
<td>1</td>
<td>1</td>
<td>One</td>
<td>Instructor evaluation of literature-based and original research papers, laboratory assignments.</td>
<td>Undergraduates enrolled in 200, 300 and 400-level classes</td>
<td>Fall, winter, spring quarters</td>
<td>85% of students get rubric grade of 2 or better on such assignments</td>
</tr>
<tr>
<td>5) Calculate quantitative problems in the discipline</td>
<td>1</td>
<td>1</td>
<td>One</td>
<td>Instructor evaluation of homework assignments, laboratory exercises, exams.</td>
<td>Undergraduates enrolled in 200, 300 and 400-level classes</td>
<td>Fall, winter, spring quarters</td>
<td>85% of students get rubric grade of 2 or better on such assignments</td>
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<tr>
<td>6) Demonstrate knowledge of core areas of geology</td>
<td>1</td>
<td>1</td>
<td>One</td>
<td>Competency test in capstone class (GEOL 487)</td>
<td>Undergraduates enrolled in capstone class (GEOL 487)</td>
<td>Winter quarter, senior year</td>
<td>70% of students must achieve a numerical score of 75% or higher on competency test on first try.</td>
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</table>

*Method(s) of assessment should include those that are both direct (tests, essays, presentations, projects) and indirect (surveys, interviews) in nature

**Data needs to be collected and differentiated by location (Ellensburg campus vs. University Centers – see NWCCU standard 2.B.2) Geological Sciences programs are all delivered at the Ellensburg campus.

***Timing of assessment should be identified at different transition points of program (i.e., admission, mid-point, end-of-program, post-program)