End-of-Semester SLO Content Exams as a CQI tool for classes with multiple instructors and sections

An example from the Earth Sciences Department
Katryn Wiese, Chair
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Geology 10 & Oceanography 1
Fall 2009 & Spring 2010

Lecture courses
3-4 sections, 4 instructors
40 to 70 students per class
Geology 10 & Oceanography 1 & Oceanography 1 Lab
Fall 2009 & Spring 2010

Lab course
2 sections, 3 instructors
30 students per class
Incremental, Continuous Quality Improvement Each Semester

1. **Plan** – Work with colleagues to create a high-quality SLO Content exam on the most important SLOs
2. **Do** – Give the exam
3. **Check** – Review the results amongst all instructors
4. **Act** – Make changes to areas where we aren’t succeeding as well as we’d like, and conduct process again.
1. Create and maintain a **course SLO document** with course mission, objectives, assessment methods, and resources

2. Have **individual instructors** assess their particular sections using a multitude of tools

3. Give **one end-of-semester SLO exam** to all sections
Each course has one Course Manager who takes on the responsibility of coordinating with all the instructors of the course. This individual has responsibility for:

- Leading the SLO Review process
- Developing and maintaining the course outline and SLO document
- Developing and maintaining the End-of-Semester Course SLO Exam
1. The **Course Manager** creates the SLO Exam with 15 questions max (to limit time but cover a maximum amount of content).

2. SLO Exam distributed to all instructors for review. **Course Manager** finalizes document.
3. Standard process for completion:
   
a) First 20 minutes of last day of class in all sections, all students.

   b) Student name required, but results won’t affect grade (ensures process is taken seriously)

   c) 10 minutes to take exam and retrieve scantrons.

   d) 10 minutes to review exam – correct answers – with students in a Semester Review format
End-of-Semester SLO Exam

4. Results tallied and all instructors get together for group review.
   
a) Some questions aren’t worded well (edit for less confusion and easier understanding of the question)

b) Some content is missing (add more questions)

c) There are differences in understanding of key topics among sections (though surprisingly little). Instructors like seeing data broken out by section.

d) Some topics are misunderstood by students in any sections and thus require extra attention.

e) We’re doing well on most of the topics covered by exam!
1. Which section are you in?
   a. CRN # 71522  Instructor: Class Lewis  Meeting time: Thursday Evening 6:30-9:20 PM
   b. CRN # 77051  Instructor: Kathryn Wise  Meeting time: Mon/Wed 9:30-11:00 AM
   c. CRN # 71521  Instructor: Kathryn Wise  Meeting time: Tues/Thurs 9:30-11:00 AM

2. What kind of plate boundary do we live on here in San Francisco?
   d. Convergent
   e. Divergent
   f. Transform
   g. All
   h. None

3. Which convecting layer drives Plate Tectonics?
   a. Inner core
   b. Outer core
   c. Crust
   d. Asthenosphere
   e. Lithosphere

4. Where is the youngest ocean crust found in the Northern Atlantic Ocean?
   a. Center
   b. Edge
   c. Midway between the center and edge
   d. Can’t be generalized

5. The volcanism of the Hawaiian Islands is a result of what process?
   a. Subduction
   b. Seafloor spreading
   c. Hotspots
   d. All of the above
   e. None of the above

6. Which happened first in Earth’s history?
   a. Pangaea came together
   b. Hard parts evolved in living organisms
   c. Plants moved onto land

7. What happens to secondary (shear/torsional) waves when they cross from the mantle to the outer core?
   a. They slow down
   b. They speed up
   c. They disappear
   d. None of the above

8. After oxygen, which element is most abundant in Earth’s crust?
   a. Iron (Fe)
   b. Magnesium (Mg)
   c. Aluminum (Al)
   d. Silicon (Si)
   e. Potassium (K)

9. All of the rocks listed below will appear at one of the five locations marked in the drawing on the right. Which rock is in the correct one found in the location marked V?
   a. Andesite
   b. Basalt
   c. Granite
   d. Idiolite
   e. Sandstone

10. Which of the following metamorphic rocks forms when limestone is buried deeply under the Earth or caught between converging continents?
    a. Phyllite
    b. Gneiss
    c. Granite
    d. Marble
    e. Idiolite

11. Convective motion is driven by what characteristic of material?
    a. Density differences
    b. Temperature differences
    c. Viscosity differences
    d. Structural differences
    e. Chemical differences

12. Which of the following changes to magma composition will increase the danger from a corresponding eruption?
    a. Decrease in silica
    b. Increase in silica
    c. Changing the amount of silica will have no effect

13. Carbon dating is NOT a technique we can use to radiometrically date a meteorite. We usually use, instead, an isotope of uranium that decays to an isotope of lead. Why?
    a. Meteorites contain no carbon
    b. Meteorites are too old for carbon dating (half-life too short)
    c. Carbon dating only works for objects that lived or were formed at Earth’s surface
    d. Answers B and C
    e. All of the above

14. What percentage of land was covered by ice during the Pleistocene Ice Ages?
    a. 15
    b. 30
    c. 50
    d. 70
    e. 100

15. Which of the following natural disasters causes the most yearly damage and financial cost in California?
    a. Mass movement (landslides, mudslides, rock falls, etc.)
    b. Earthquakes
    c. Volcanic eruptions
    d. Tsunamis
    e. Floods
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<tr>
<th>Question</th>
<th>Correct Answer</th>
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<td>Q15.A</td>
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**Topic not emphasized enough in this section:**

- Wide range

**Major misunderstanding:**

- Wide range
End-of-Semester SLO Exam

5. The **Course Manager** creates new SLO Exam for next semester and assigns action items for areas we appear to be failing. Examples:

   a) Course handouts specific to tough subjects
   
   b) Increased classroom emphasis on tough subjects
   
   c) Develop new mini-labs or activities to help with tough subjects.

6. Recognize this exam is limited in its usefulness, but does bring good conversation.
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