

Assessment Project Report

Direct Measurement of Geology Student Learning for a Culminating Experience Field Course Geology 107

by

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What was your project about? What did you do? Why did you do it? What did you want to find out or what were you trying to measure and for what purpose?

The project involved developing and administering an assessment exam that incorporates questions from the prerequisite courses and electives of Geology 107. The purpose of the project was to evaluate student preparedness for our culminating experience course (Geology 107, Advanced Field Methods). The success of students in Geology 107 is largely dependent on knowledge and skills acquired in the prerequisite courses. Ultimately, we want to use the exam to identify any areas where changes might be helpful to the prerequisite courses, if students are found to be unprepared, and also to identify parts of our undergraduate program that are working well.

Questions covering significant concepts or skills from lecture and lab were gathered from faculty teaching the major prerequisite courses for Geology 107. The prerequisite courses include Geology 30 (Introductory Field Methods), Geology 101 (Igneous and Metamorphic Petrology), Geology 102 (Sedimentology), Geology 104 (Scientific Writing and Research Techniques), and Geology 106 (Structural Geology). Additionally, we gathered questions from upper division elective courses, including Geology 105 (Geomorphology), Geology 110 (Invertebrate Paleontology) and Geology 122 (Stratigraphy). Geology majors must take two of the three above named electives.

The exam we generated was given to eight senior undergraduate Geology majors at the beginning of December 2006. The exam was administered over two class periods (3 hours total) in Geology 104 (Scientific Writing). While the students were required to take the exam, the students were informed that their performance on the assessment exam would not affect their Geology 104 course grade. The students taking the exam had completed or were in the process of completing the major prerequisite courses for Geology 107. This group of students is now enrolled in Geology 107 for spring 2007. The timing of the exam is optimal because students are completing the prerequisite classes in the fall of their senior year, just before taking Geology 107 the following term.

We decided to develop this assessment method because of recent concerns over student preparation for Geology 107. In the past couple of years, some students appeared not to possess some basic skills necessary to excel in Geology 107 and we wanted to determine why this apparent problem exists. As mentioned earlier, success in Geology 107 is

dependent upon students being adequately prepared through successfully completing the prerequisite courses.

What were your findings?

All sections of the exam have been evaluated except the part pertaining to Geology 101. The faculty member who teaches that course has not yet had time to complete his analysis. However, we expect that the results will be consistent with the remainder of the exam. Overall, exam results for the prerequisite courses were consistent across the board. There was no single course where students performed significantly better or worse than any other. Student performance was not up to our expectations on any section of the exam. Many questions were left blank, or incompletely answered. Before our results have any meaning, we must follow-up with the students to determine why they did not answer many questions or provided incomplete answers (see Fig. 1).

How did you use the findings or how are you planning to use them?

We believe this assessment exam can be developed into a valuable tool to help us identify strengths and weaknesses in the undergraduate Geology major program. However, we must overcome some problems identified following implementation of the exam. (See below.) Our aim is to incorporate this assessment activity into our undergraduate Geology major SOAP and to conduct the assessment method on an annual basis.

Did you run into any problems? If so, what were they and how did you resolve them (assuming that you did. If you didn't resolve them, is there something that would help?).

One of the greatest challenges in this assessment process was coordinating the faculty's input. It took several attempts to get faculty to submit questions for the exam relative to his or her courses. Upon completion of the exam, the faculty was asked to evaluate their portion of the exam, but many had to have several reminders to get it done. As of this report, one section's results are still incomplete.

The students did not seem to take the exam as seriously as we had hoped although we did try to convey the importance of it. Students did not have an incentive to perform as best they can. It was not part of any course grade and, as a result, they do not appear to have applied all of their abilities to the exam. As noted previously, many questions were incomplete or simply left blank. The Department needs to determine why these questions were left blank, i.e., did the students run out of time? Did the students not know the material? Or, did the students just not attempt the questions? These questions are pertinent to a meaningful evaluation of the assessment exam. In one case, with Geology 104 (Scientific Writing), it was likely an issue of time and priorities for the students. The students were given a take-home writing exercise but some did not do it, probably because of the need to complete other course work and lack of incentive.

To resolve the questions above, the assessment team plans to contact the students who participated and discuss the exam with them in an attempt to determine why many of the questions were left unanswered. As well, in the future, we need to determine a means by which to get the students to strive to do their best on this exam. Should we incorporate the exam into one of the courses for a grade, so that the students will take it more seriously? Or, is it a good idea to conduct the exam as a competition with the best score receiving an award? Guidance on how best to solve this problem would be greatly appreciated.

The exam results on this first attempt have provided the Department with little information because of problems we encountered. With some modifications, we should be able to change that and devise a way to effectively assess the students' learning experience.

Although we ran into some difficulties with our initial attempt at this assessment activity, it has provided us with valuable insight into assessment administration. This will leave us better prepared to administer future assessment exams. It is our intent to make adjustments to the exam process and incorporate the exam into our Geology major undergraduate SOAP after this next year. Again, any advice you might have to help us along with this process would be appreciated.

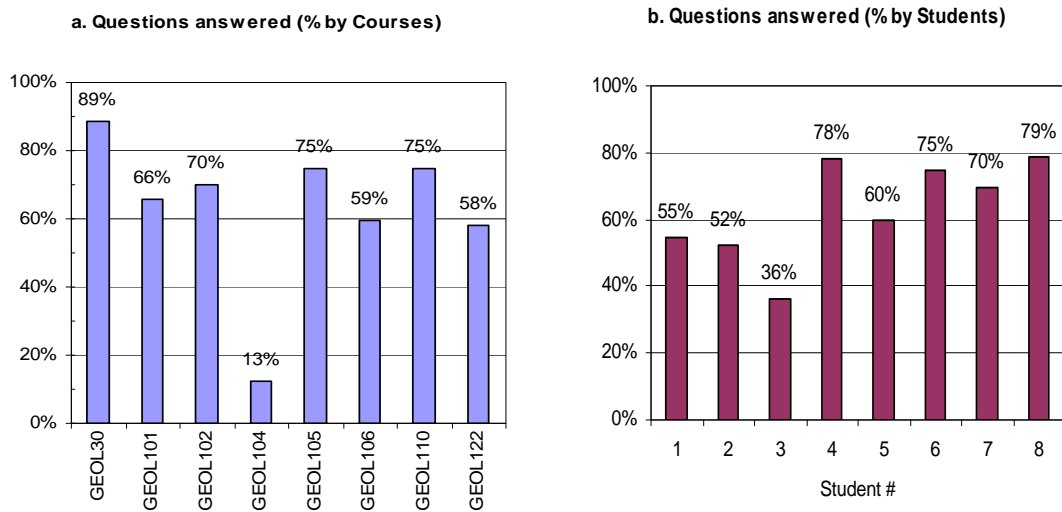


Figure 1. Questions Answered: (a) by courses, and (b) by students.