ASSESSMENT OF STUDENT LEARNING
Department of Geology
University of Puerto Rico at Mayaguez

Progress Report

Period of Report

August to December of 2005

Purpose of the Assessment

During this semester we continued assessing student learning in the Geology Department by the revision of the curriculum and undergraduate research activities. The collected data is used to evaluate the performance of the Department, which will provide recommendations to accomplish our Mission and Objectives. Specifically, at this first stage of our assessment process we are evaluating how the curriculum and the research activities are matching with the Geology student profile.

Assessment Activities

1. All data collected with the curriculum questionnaire during the past two semesters were compiled, processes, and analyzed. The data was obtained from junior and seniors students enrolled in Geol 4045 (Petrogenesis of Crystalline Rocks), Geol 4046 (Sedimentary Environments and Lithogenesis), and Geol 5026 (Tectonics), Geol 4009 (Stratigraphy), Geol 4057 (Environmental Geophysics), and Geol 5006 (Sedimentation). The average enrollment in the Geology Department is 100 students per semester, which means that the collected data represented around 29 % in fall 2004 and 15% in spring 2005 of the entire students' population. Even when it was impossible to determine how many students repeated the questionnaire; it should be less than 10% of the sample.

2. A questionnaire for assessment of undergraduate research was submitted to the students enrolled in the courses Geol 4049 (Undergraduate Research I) and Geol 4055 (Undergraduate Research II). This questionnaire was also the same used last semester and it can be found in the Fall 2004 report.

3. The comprehensive exam prepared by Dr. Wilson Ramirez (member of the assessment committee) was reviewed; it will measure the general knowledge in Earth Sciences of freshmen and seniors students in Geology.

4. The assessment section in the Geology Department webpage was updated. All the activities, reports, results, and interpretations were posted.

5. Portfolios of several courses were continued (i.e. Geol 3105-Images of the Earth).

Accomplishments and Results

During the past eleven years the Department of Geology has graduated 108 students, of which 54 have been male and 54 female. Figure 1 shows the detailed trend of graduated students during those years. It is important to notice the clear impact of our department in producing female geoscientists, a minority group according to global statistics. We are now gathering other similar statistical data (like enrolled students, number of professors, and offered courses) and they will be presented in future progress reports. We intend to continue monitoring all these critical parameters in order to better understand the outcomes of our department.

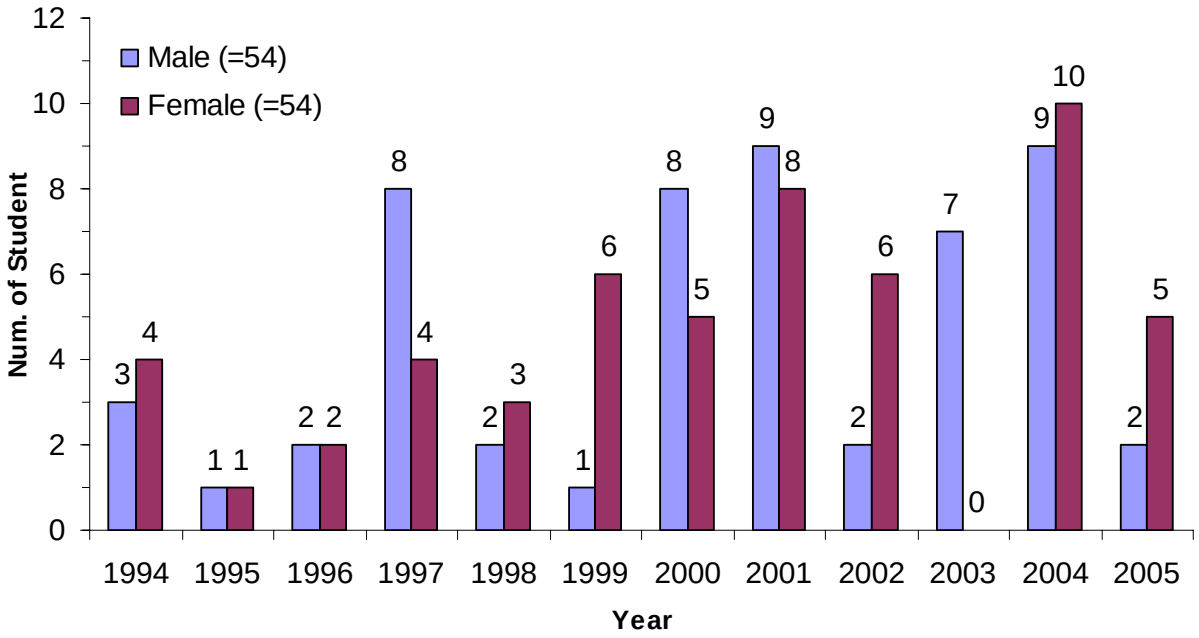

Figure 1: Students graduated in the Department of Geology during the past 11 years.

During the previous two semesters we selected six concentration courses of Geology to gather data about the curriculum. All questions, except the last one, were prepared to be answered in a computer sheet and they were tabulated and statistically analyzed by the University Computer Center. The 30 questions were clustered and analyzed by three critical areas, including: (a) skills and values, (b) scientific knowledge, and (c) overall performance of the Department. We also put special attention to question number two that deals with the Department which the students were accepted when entered to UPRM.

Since the beginning of the Geology Department we have experience a large exchange of students with other departments. Every year several students enter to Geology and later move to other departments and vice versa. This movement of students has never been studied systematically, but it is well known that this condition introduces a new dimension to our Department dynamics. During our curriculum assessment we asked about this issue and the results are presented in Figure 2. It is important to notice that 21% and 13% of the students

interviewed in December 2004 and May 2005, respectively, entered to other departments before they changed to Geology.

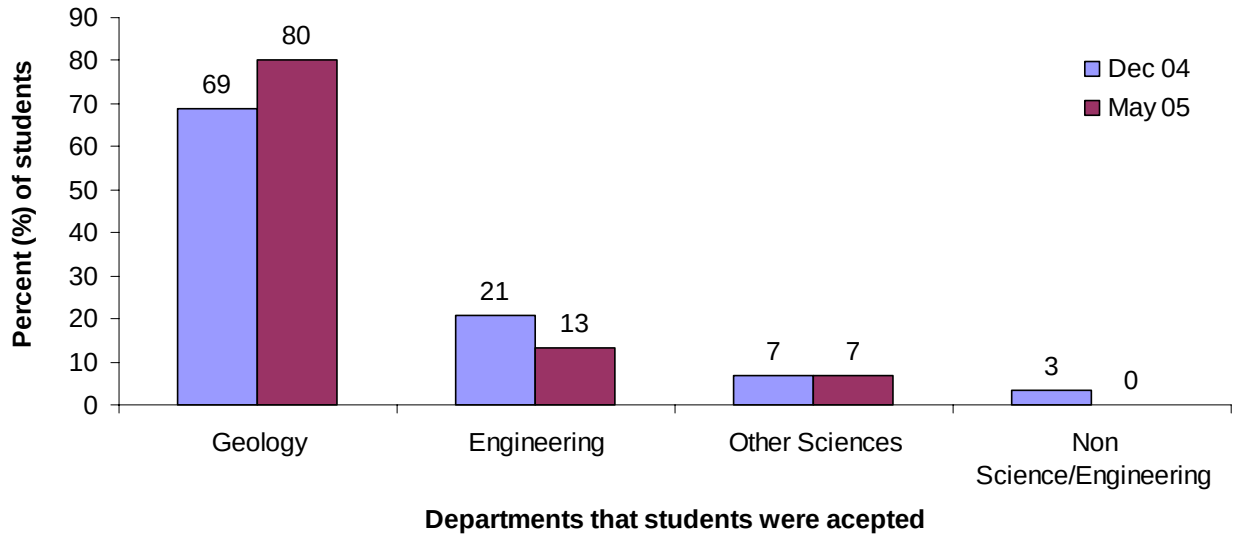

Figure 2: Departments which students were accepted when they entered to UPRM.

The effectiveness of the Geology Department curriculum in developing certain skills and values was considered excellent or good by most students that participated in this assessment (Figure 3). Only 5% in December 2004 and 1% in May 2005 of the students considered that it is poor in developing those skills and values. According to the results the areas that must be improved are related with the scientific tools and techniques, and ethics.

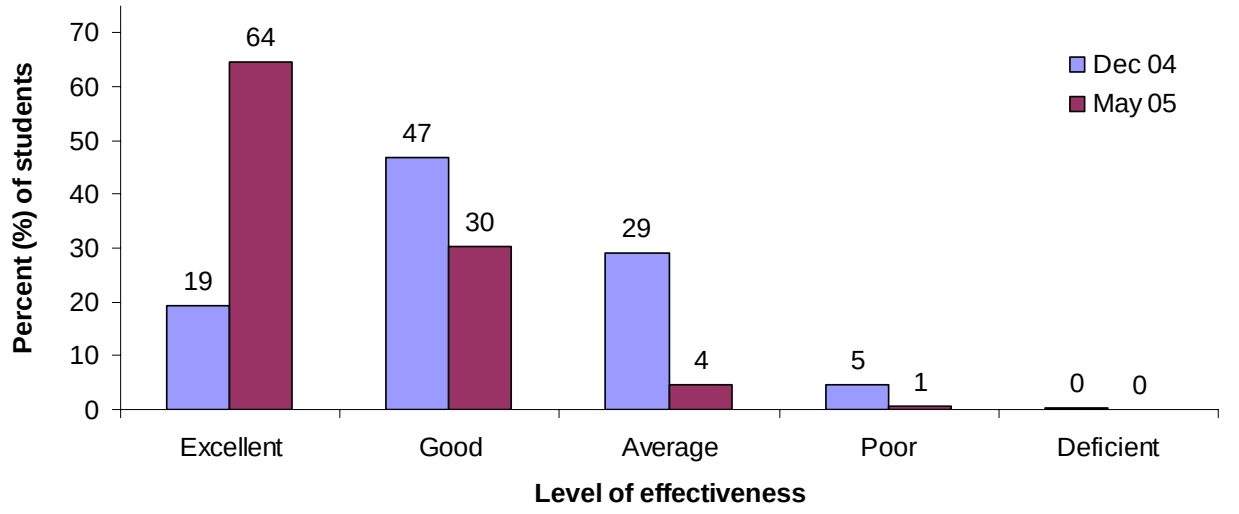

Figure 3: Effectiveness of the Geology Department curriculum in developing skills and values.

The effectiveness of the Geology Department curriculum in developing the scientific knowledge of specific fields was considered excellent or good by less than 50% of the interviewed students during December 2004 and May 2005 (Figure 4). According to these students the strongest areas in the curriculum are sedimentology and stratigraphy; followed by

geophysics and seismology, geomorphology, and mineralogy. Based on the data collected during both periods our curriculum must be more effective on developing the scientific knowledge. Figure 4 shows that 25% of the students in December 2005 and 20% of the students in May 2005 indicated that the effectiveness of our curriculum in that area is poor or deficient. Table 1 shows that 63% and 54% of the students interviewed in December 2004 and May 2005, respectively, consider that our curriculum is poor or deficient in scientific knowledge related with geochemistry.

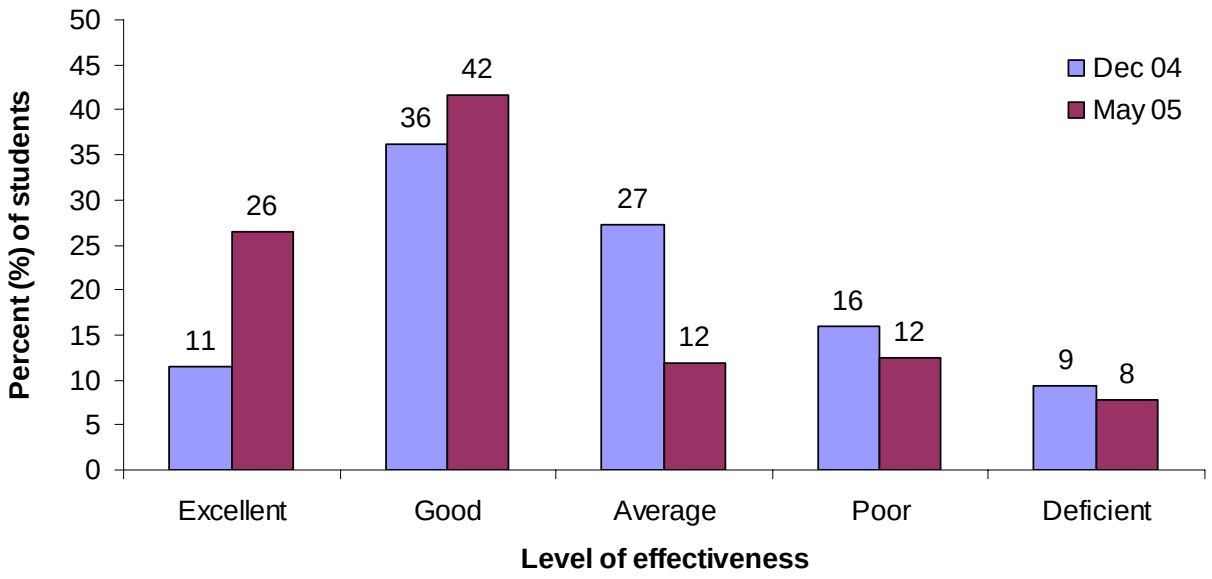

Figure 4: Effectiveness of the Geology Department curriculum in developing scientific knowledge.

Field Area	Dec 04	May 05
Paleontology	26	27
Sedimentology and Stratigraphy	0	13
Structure &Tectonics	15	20
Igneous and Metamorphic Petrology	7	20
Geomorphology and Quaternary Geology	4	13
Hydrogeology	44	27
Geophysics and Seismology	41	7
Environmental Geology	11	20
Geochemistry	**63**	**54**
Engineering Geology	44	13
Mineralogy	11	20
Geology of Puerto Rico	37	7

Table 1: Specific fields in the Geology Department and the percent of students that consider as poor or deficient the effectiveness of the curriculum in developing the knowledge of those areas.

The overall performance of the department was evaluated by considering several criteria as strength (A) or weakness (F). Table 2 shows the grades given by the students in each criterion. According to them the faculty and courses content are the most strong areas with a grade of B, while the other areas received a grade of C. A clear improvement is needed here.

Criteria	Dec 04	May 05
1. Variety of Courses	C	C
2. Laboratory Equipment and Facilities	C	C
3. Faculty	B	B
4. Flexible Curriculum	C	B
5. Courses Content	B	B
6. Research Opportunities	C	B
OVERALL PERFORMANCE	C	B

Table 2: Overall performance of the Geology Department by specific criteria.

The assessment of undergraduate research was completed by all students enrolled during Fall 2004 and Spring 2005 in Geol 4049 (Undergraduate Research I) and Geol 4055 (Undergraduate Research II). Preliminary analyses and interpretation of the collected data was performed. Results and interpretations will be presented in future progress reports.

Work Plan for Next Semester (Spring 2006)

The assessment activities for next semester (August-December, 2005) in the Department of Geology will focus in the following:

1. Continue the assessment of the curriculum and undergraduate research.

2. Continue processing the collected data and perform the appropriate analyses and interpretation of the results.

3. Continue working with the portfolio of the courses.

4. Continue improving the Web Page of the assessment in the Department of Geology.

5. Prepare and offer a questionnaire to assess the Departmental Facilities, including the computer laboratory, teaching resources, research equipment, and others.

6. Next semester we plan to close one the loop of assessment.