



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



Progress Report

Period of Report

January to May of 2005

Purpose of the Assessment

During this semester we continued assessing student learning in the Geology Department by the continuous revision of our educational objectives, curriculum, and program outcomes. 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 is matching with the student profile and the impact of research activities.

Assessment Activities

1. A questionnaire for curriculum assessment was submitted to the students enrolled in the courses Geol 4009 (Stratigraphy), Geol 4057 (Environmental Geophysics), and Geol 5006 (Sedimentation). The same questionnaire of last semester was used and it was included at the end of the previous progress report.
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 was included at the end of the previous progress report.
3. A comprehensive exam of 50 questions was prepared by Dr. Wilson Ramirez, a member of the assessment committee, to measure the general knowledge in Earth Sciences. This exam will be offered at the beginning (to the freshmen) and the end (to the seniors) of the academic program. We will offer this exam for the first time to the freshmen students in August 2005.
4. The processing of the collected data during the last semester was completed; preliminary analyses and interpretations of the results were generated and they are presented here.
5. A new section for assessment was prepared for the Geology Department webpage. All the activities, reports, results, and interpretations will be posted in this section.
6. Portfolios of several courses were started (i.e. Geol 3105-Images of the Earth).

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Accomplishments and Results

During the past ten years the Department of Geology has graduated 101 students, of which 52 have been male and 49 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.

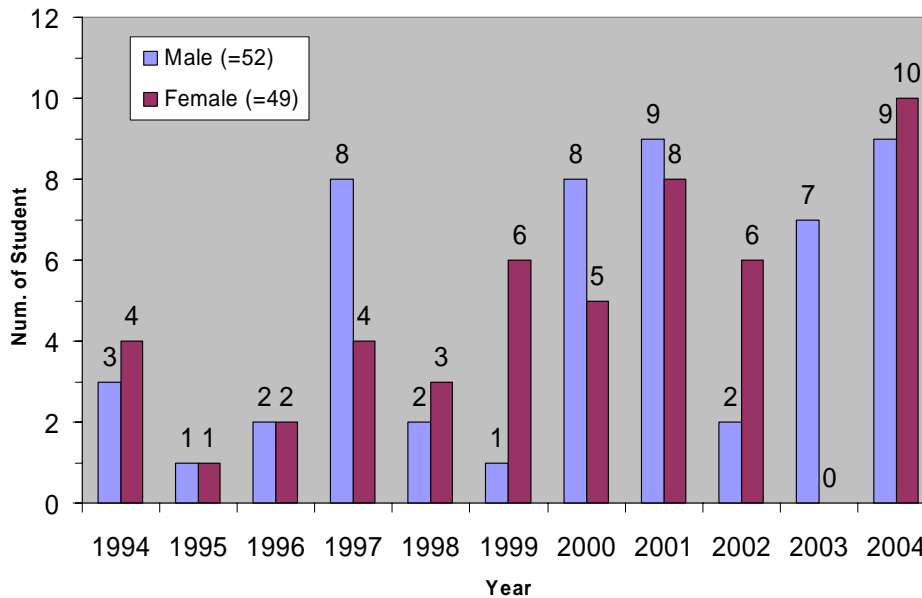


Figure 1: Students graduated in the Department of Geology during the past 10 years.

During the last semester (August-December, 2004) we selected three concentration courses of Geology to gather data about the curriculum. The courses were Geol 4045 (Petrogenesis of Crystalline Rocks), Geol 4046 (Sedimentary Environments and Lithogenesis), and Geol 5026 (Tectonics). Twenty nine (29) students from third and fourth year completed the questionnaire of 31 questions. 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 the curriculum assessment of last semester we asked about this

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issue and the results are presented in Figure 2. It is notice that 9 out of 29 students (31%) entered to other departments before they changed to Geology.

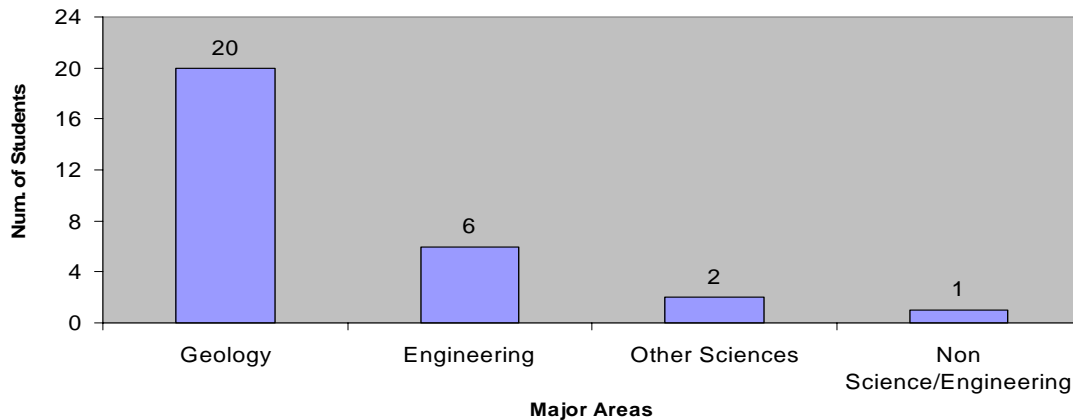


Figure 2: Departments which students were accepted when they entered to UPRM.

The effectiveness of the Geology Department curriculum in developing certain skills and values is considered good according to the 47% of the students that participated in the assessment last semester (Figure 3). Only 19% of the students consider that it is excellent, 29% said it is average, and 5% think that our curriculum is poor in developing those skills and values. Based on this preliminary analysis we must improve in areas related with the scientific tools and techniques, and ethics. However, more data is necessary to provide strong conclusions.

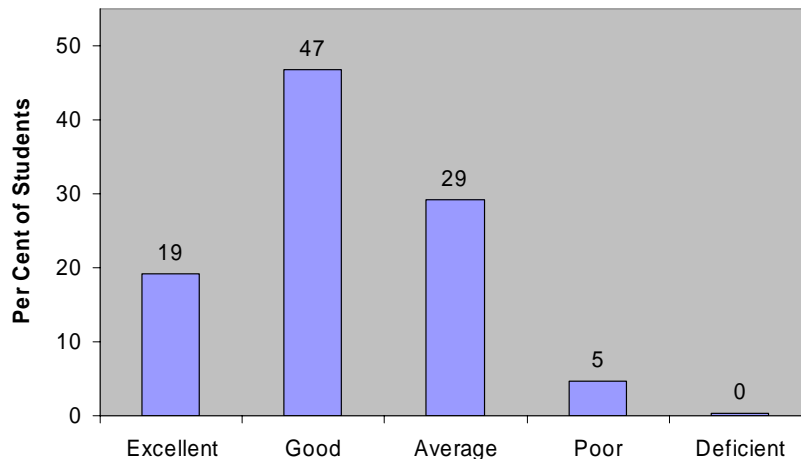


Figure 3: Effectiveness of the Geology Department curriculum in developing skills and values.

The effectiveness of the Geology Department curriculum in developing the scientific knowledge of specific fields is considered excellent for only 11% of the interviewed students (Figure 4). While the 36% think it is good, for 27% is average, for 16% is poor, and 9% consider that this area is deficient in our curriculum. Table 1 shows the specific areas that were evaluated. It is noticed that Engineering Geology and Geochemistry are identified as deficient by 24% and 28% of the students, respectively. These results are very preliminary and more data are necessary.

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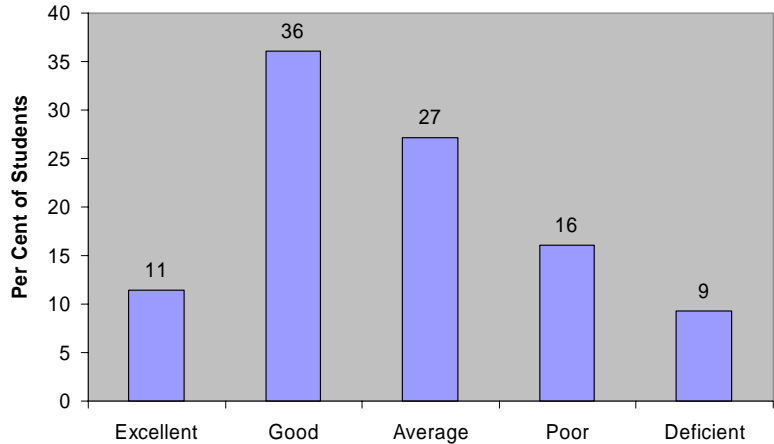


Figure 4: Effectiveness of the Geology Department curriculum in developing scientific knowledge.

Field Area	Percent
Paleontology	0
Sedimentology and Stratigraphy	0
Structure &Tectonics	3
Igneous and Metamorphic Petrology	0
Geomorphology and Quaternary Geology	0
Hydrogeology	10
Geophysics and Seismology	17
Environmental Geology	0
Geochemistry	24
Engineering Geology	28
Mineralogy	0
Geology of Puerto Rico	20

Table 1: Specific fields in the Geology Department and the percent of students that consider as 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	Grade
1. Variety of Courses	C
2. Laboratory Equipment and Facilities	C
3. Faculty	B
4. Flexible Curriculum	C
5. Courses Content	B
6. Research Opportunities	C

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

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The assessment of undergraduate research was completed by all twelve (12) students enrolled during the fall semester of 2004 in Geol 4049 (Undergraduate Research I) and Geol 4055 (Undergraduate Research II). A preliminary analysis and interpretation of the collected data was performed. However, the trends are not clear due to the small group of students that participated and more data will be collected in order to show confident results.

Work Plan for Next Semester

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. Offer for the first time the comprehensive exam to freshmen students to measure the general knowledge in Earth Sciences.