DEANSHIP OF GRADUATE STUDIES AND RESEARCH

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Assessment of Student Learning in Graduate Programs

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I. Introduction

The URP-RP graduate programs have engaged in the assessment of student learning outcomes through the implementation of diverse assessment plans and assessment activities. In 2005, the Deanship of Graduate Studies and Research (DEGI, by its Spanish acronym) began the implementation of the UPR-RP Student Learning Assessment Plan (SLEP). DEGI produced a guide for graduate programs to write their own plans. Nearly fourteen (14) programs produced their plans, which were presented to the *Middle States Commission on Higher Education* (MSCHE) during their accreditation visit in 2005 as evidence of the progress made in relation to Standard 14 (Student Learning Assessment). The MSCHE 2005 visit report to the UPR-RP included a recommendation regarding the need to demonstrate significant progress in the implementation of the Student Learning Assessment Plan at both undergraduate and graduate programs. As of today, 97% of the graduate programs (that is 35 out of 36) have implemented assessment plans and 94% submitted a diagnostic report, 75% have implemented one or more changes based on the recommendations that were presented in the diagnostic report, and 17% have completed a whole assessment cycle by making a second round of assessment or by evaluating at least one of the implemented changes.

II. Description of Implementation

DEGI has assisted in the assessment of student learning for graduate programs with necessary resources, education and training experiences. DEGI also has provided for orientation meetings, follow-up meetings, compliance memorandums and the allocation of funds to propel this initiative during its various phases. These efforts were assisted by articulated institutional actions and events such as:

1.) Dr. Donna Sundre, Director of the Evaluation Center at Madison State University facilitated a series of workshops to guide graduate programs (chairs, coordinators and administrators) and dean's offices (deans and assistants) in the development of student learning assessment plans during 2004.
2.) Appointment of a Coordinator of Student Learning Assessment in 2005. Subcontracting advisors to implement twenty-eight focus groups as part of the learning assessment plan (2007-2009).
3.) Eight programs received funds for the allocation of release time for faculty members responsible for doing learning assessment as part of the programs' self-studies (2008-2009).

4.) Allocation of funds assigned for contracting 21 external advisors for graduate programs (2008-2009).

In 2005, DEGI developed a guide to document and collect data with parameters aligned with those of the UPR-RP SLEP. The guide allowed each program to adapt plans to their units' problems and priorities. In consequence, programs produced ambitious and non cost-effective plans in terms of time and resources. While some programs continued making progress in implementing their plan, others stayed behind. The need to expedite the implementation of a cohesive long-term Campus-wide learning assessment plan in graduate programs made DEGI to revise the guide in 2007. The revision of the original guide reduced the number of competencies to be evaluated to two: *critical thinking* and *research skills*. These competencies were measured by implementing two activities. The first activity assessed student written works to measure critical thinking, and the second activity was composed of focus groups interviews organized to assess students' perceptions regarding research skills. This binary approach complied with SLEP's expectation of programs to include at least one direct and one indirect measure to assess the competencies under scrutiny, respectively.

DEGI provided all graduate programs with a rubric for the assessment of critical thinking competencies to be applied to student's written works that were developed *before* they began their thesis.[1] This allowed DEGI to complete a comprehensive assessment of the critical thinking skills that graduate students possessed prior to beginning a formal research project. The definition of critical thinking that was applied to the rubric build on the idea of high level of reasoning directed toward research[2]. In other words, the activities provided factual evidence based on direct observation for both critical thinking and research skills.

The focus groups were used as an exit assessment experience. The goal was to record the research experiences of students who were *concluding* their thesis or research projects. Evaluating a written work (as described earlier) and the focus group allowed DEGI to assess students in critical thinking and research skills *before* and *after* completing an academic research project.

The revision of the learning assessment process also provided for a greater degree of uniformity in terms of information gathering, and contributed to guiding the analysis and further consideration of the obtained data. The majority of the programs adopted DEGI's revised plan of 2007. This report explains in detail the results of this group of programs. Nonetheless, a small number of programs continued with the

[1] The rubric was adapted from the Guide to Rating Critical and Integrative Thinking with permission from the Center for Teaching, Learning, & Technology, Washington State University.

[2] The criteria used in the rubric were: Capacity to identify or appropriately formulate the problem, identify the premises and contextual situation, use data and evidence appropriately, present own point of view, integrate external points of view and provide a conclusion. An additional criterion was added concerning communication to examine if this was a determining influence in the execution of other competencies.

initial 2005 plan and still a few others opted for implanting the revised plan with minor changes. This smaller group of programs is addressed in a separate section of this report.

In 2007-2008 the rest of the graduate programs were incorporated into the assessment project. DEGI requested eight of the programs to include their assessment plan as part of their five-year self-study, which included all program components. This initiated the integration of the two processes (learning assessment and program evaluation) which has led to substantial progresses in terms of improving time and cost effectiveness.

III. New Developments

The implementation of the learning assessment plan of graduate programs has been divided into three stages: a diagnosis of the performed assessment; changes based on the diagnosed situations, and the results of the implemented changes. The percentages presented in this section were calculated based on the total number of master's and doctorate degrees offered during the time period of this report (36)[3]. The different specialties of each discipline were not counted toward this total. The MLL in Law did not participate in the assessment process for not having enough registered students.[4]

As of today's date, 94% of all graduate programs[5] have submitted their diagnostic reports. Most of them included short and long term recommendations to perform adjustments based on the findings of each program. As requested by DEGI, over two thirds of the total number of programs that offer master's and doctorate degrees assessed each degree separately. The remaining programs submitted one report for both grades.

Thirty-two programs organized focus groups (DEGI sponsored twenty-eight of those) to measure their students' research experience. Twenty-six programs evaluated critical thinking (twenty with the rubric provided by DEGI) with the use of the before-mentioned activities (evaluation of a written work and a focus group). Variations in the plans responded mostly to the way in which certain programs took charge of the assessment process and adapted it to their particular needs.

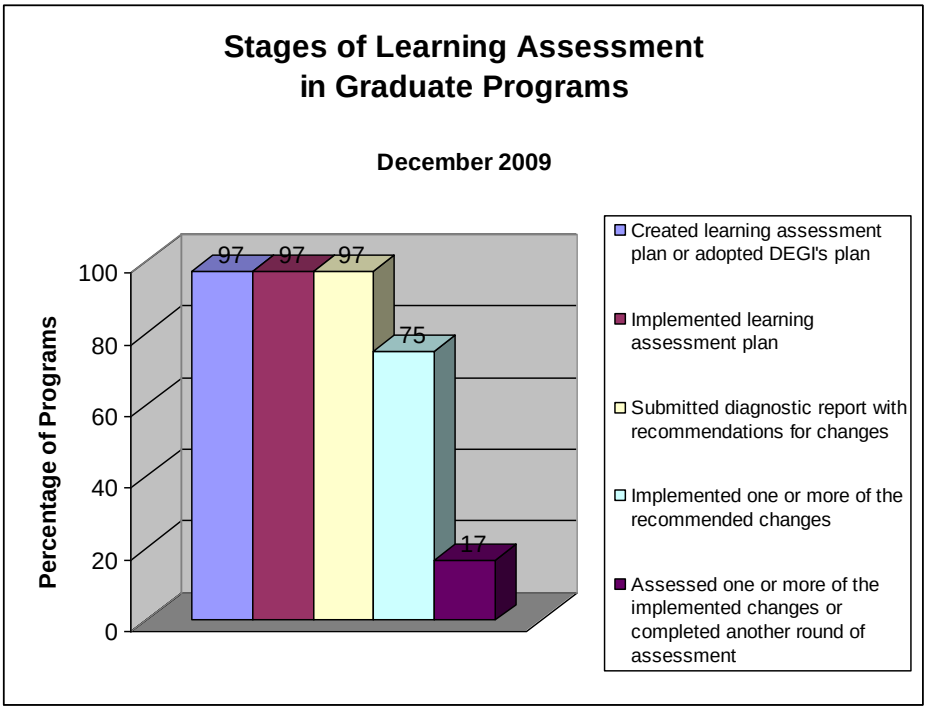
[3] Masters (M) and Doctorate (D) degrees: Business Administration (M), Business Administration (D), Architecture (M), Biology (M), Biology (D), Physics (M), Physical Chemistry (D), Mathematics (M), Mathematics (D), Chemistry (M), Chemistry (D), Public Administration (M), Rehabilitation Counseling (M), Economy (M), Psychology (M), Psychology (D), Sociology (M), Social Work (M), Social Work (D), Communication (M), Law (MLL), Law (JD), Education (M), Education (D), EGCTI (M), English (M), English (D), History (M), History (D), Spanish (M), Spanish (D), Linguistics (M), Philosophy (M), Comparative Literature (M), Translation (M), Planning (M).

[4] This program represents 3% of the graduate programs.

[5] Public Administration (MPL) couldn't hand in the diagnostic report on time because its incorporation into the assessment process was belated.

In November 2009, 73% of the programs (see Figure 1) submitted a progress report with an explanation of the interventions made to address some of the findings that were identified during the diagnostic report.

Figure 1



IV. Diagnosis of the Performed Assessment

Despite the great variety of programs and reports, the resulting data allowed the DEGI to identify certain congruencies and tendencies that can be used to make informed decisions in regards to future assessment, the implementation of changes and adjustments to graduate programs, institutional policies, and support services.

The following data comes from the diagnostic reports. The report included two forms:

1) the plan guide used by programs to provide necessary information concerning the elements of program's design and their interconnections (vision, mission, programmatic goals and objectives, graduate profile, new admissions profile, general and specific learning objectives, curriculum, course sequences and a matrix aligning courses and objectives.

2) a template to provide a description of the results of assessment exercises that included analysis questions and additional space to present recommendations about findings.

A. Analysis of Program Design:

Table 1, below, provides an analysis of the findings on programs' design components.

Table 1 Evaluation of general components of Graduate Students assessment plans

Program Design	Excellent or Acceptable	Needs revision	Does not have one	Not enough meaningful information to evaluate criteria	Not included in this report
Vision	17%	28%	44%	8%	3%
Mission	64%	19%	6%	8%	3%
Program Goals and Objectives	11%	72%	0%	14%	3%
Graduate Profile	39%	31%	14%	14%	3%
Learning Objectives	31%	22%	28%	17%	3%
Incoming Student Profile	0%	8%	89%	0%	3%
Admission Requirements	72%	25%	0%	0%	3%
Curriculum	31%	61%	0%	6%	3%

1. Program Vision and Mission

Programs that offer Master's and doctoral degrees usually have the same vision and mission for both programs (except Social Work and English) but they were counted separately for the purpose of this report. According to this, 17% of the programs have an acceptable vision, 28% need to review it and 44% have none. Close to two thirds of the programs (64%) posses an excellent or acceptable mission. Only a fifth of them (19%) need to review it.

2. Programmatic Goals and Objectives

Seventy two percent of the programs (72%) need to review their programmatic goals and objectives because they are too conceptual (philosophical) or only concentrate on learning and research without mentioning other program areas. In general, programs do not seem to have a clear understanding of the operational purpose of the programmatic goals and objectives as the basis for developing work plans and performance indicators.

3. Graduate profile[6]

More than two thirds of the programs (70%) provide a graduate profile (39% have an adequate profile and 31% need to review it because is too generic, brief or weak). Fourteen percent (14%) lack a

[6] The graduate profile is the statement that defines the characteristics of the ideal graduate.

graduate profile per se, and alternatively use the standards of the professional accreditation agency or applies the master's graduate profile to the doctorate program.

4. Learning Objectives[7]

A little more than half of the programs (53%) have learning objectives (31% have acceptable objectives and 22% need some revision). Twenty-eight percent (28%) need to create the objectives or provide evidence of them.

5. Incoming Student Profile and Admissions Requirements

Seventy two percent of the programs (72%) provide good or excellent admission requirements, very demanding when compared to other universities. However, a minimum number of the programs, namely, History, Spanish, and Philosophy provide an onerous number of pre-requisites in terms of credits (between 18 and 30 credits). Chemistry, Physics, and Architecture also need to redefine their pre-requisites in order to compete with comparable universities or to adapt to the diverse cultural backgrounds of the populations they aim to attract[8]. On the other hand, only 8% of the programs have identified in writing an incoming student profile, or some of the criteria they apply to define the minimum learning skills that incoming students should possess.

6. Curriculum Design

Although our programs stand out by their strong theoretical offerings, almost two thirds (61%) of the programs need to revise an essential aspect of their curricula in order to create circumstances that are more conducing toward research. Among some of the aspects that directly impact student performance in research are:

- insufficient statistical, methodological, or hands-on training
- inadequate sequence of requirements which obstructs early acquisition of theoretical or methodological knowledge necessary for research
- the simultaneous occurrence of requisites that compete for attention
- an excess of credits or requirements
- little or no flexibility to substitute requirements
- a lack of agreement between professors' lines of research and the programs' specialty or subject area

Programs that receive professional accreditation usually have curricula that require more credit units and are more prescriptive than those of the average programs, but paradoxically their retention and

[7] The learning objectives refer to the operational principles that orient student learning while in the program.
[8] The comparative criteria employed in this analysis for incoming classes are based on information gathered from the self-study made by each program.

graduation rates are regularly 20-50% higher than those from programs that do not receive professional accreditation.

The comments extracted from the focus groups seem to imply that not having enough elective courses obstructs the development of students' research interests and affects time to degree. This problem reveals a lack of harmony among a number of program-related issues such as: student research interests, the increment of part-time enrollment, and the limited number of diverse specialized courses in evening schedules. The shortage of academic counseling and the need to plan the academic offering for the long-term (more than one semester) is also palpable. To compensate for the shortage of courses, students prefer not to follow the curriculum sequence proposed by their programs. This in turn hinders student's ability to acquire specialized knowledge in an organized and appropriate manner, limiting their ability to define and develop their research topic and complete their degree in a reasonable time.

B. Analysis of Critical Thinking Skills as Applied to Research (Data from Direct Observation)

Twenty programs out of 36 programs evaluated critical thinking; twenty used the rubric provided by DEGI to measure critical thinking but each one implemented it on its own. For that reason the implementation process was not uniform. Some programs were more demanding than others when interpreting the rubric criteria and scoring students' works. Also, each program used different types of student written works and different sampling methods (sample size average=7). Given this situation, it would not be appropriate to average the scores of the different programs nor compare the raw measurements among each other. However, the analysis of the patterns created by the maximum and minimum scores of each program provides valuable information (See Appendix 1).

The rubric established a performance indicator of 5 points for masters and 6 points for doctorate programs in a scale of 1 to 6. Based on these indicators it could be inferred that seventeen out of twenty programs did not reach the expectation. Nonetheless, it is necessary to clarify that these performance indicators were extremely rigorous since their inception. A careful reassessment of these indicators would locate them around the 4.6 for the masters' and 5.6 for the doctorate programs. In this case, eleven programs (55%) would partially reach the performance indicator, meaning that would reach it for at least one of the seven rubric criteria.

The criteria that most frequently received the lowest scores were (See Appendix 1):

- "Presents, develops, and communicates **own** perspective, hypothesis or position"
- "Elaborates the argument using **other** (disciplinary) perspectives and positions"
- "Presents, evaluates, analyzes and uses data/evidence appropriately"
- "Evaluates and elaborates conclusions, their implications and consequences"

There is a possibility that low scores in the criterion related to the elaboration of conclusions are based on an error because a number of the student works collected for this exercise did not require evidencing this skill. The scores for the other criteria received the support of programs in report comments. For example, the Master's Program in Business Administration identified students' difficulty to evaluate information and sources in a critical manner, perform according to what he/she has learned and developed solid arguments. The report submitted by the Master's Program in Social Work 2009, illustrates with the following comment the superficiality characterized in student sample work with regard to information management:

> "Generally, the student body built their proposal in a linear and progressive fashion opening with a definition or statement of a problem, taking into consideration, and in a superficial manner, the analysis of published literature (four to five studies), and the application of a theoretical and conceptual framework to conclude in two or three investigation purposes. Very few students recognize the complexity of the problems, analyze biased perspectives in the described studies, consider conflicting points of view, or recognize the consequences of their theoretical selections. In occasions, they do not recognize their own biased opinions and repeat information without elaborating sustainable arguments."

Students comments during the focus groups shed some light about what could be causing them difficulties when managing information: problems with limiting the quantity and pertinence of researched sources (even in descriptive projects), and the lack of skills and computer programs to facilitate organizing information for the analysis of published literature. English students mentioned that keeping a journal of each reading they made was a great strategy when revising literary findings and in the writing process itself. Even so, little is known about what caused the lack of depth and the effective integration of information into the students' arguments.

The Programs in Communication, Rehab Counseling, and Psychology employed different strategies and used different rubrics to measure *critical thinking*. The first two programs had positive results in terms of the acquisition of this competency. On the other hand, the Psychology Program could not identify a significant result in the acquirement of this skill. This topic should be investigated in depth to corroborate the results of the studies.

C. Assessment of the Research Experience (Indirect Information)

Below are challenges and opportunities faced by graduate programs as derived from graduate student comments in the focus groups hosted by DEGI.[9]

[9] Student participants had to be in an advanced stage of their research or have recently graduated from the program. They ranged between the ages of 23 to 62 years. The sample was representative of the population working on their thesis or

1. Challenges

Although the guide for the focus groups posed questions related to the learning process, the majority of the aspects that students perceived as obstacles to developing their research projects were not directly linked with their preparation or aptitude for learning, but with environmental factors related to the program and the institution. The following factors were mentioned in most groups:

- the need for financial aid adjusted to the cost of living
- aspects related to library use, namely: scarcity of updated bibliographical resources (especially books) [10], lack of adequate spaces in which to conduct research (comfortable, silent) and spaces to hold meetings, lack of extended scheduling for the libraries, limited amount of specialized personnel to manage archives and technical difficulties when accessing databases from non-Campus locations
- lack of basic equipment such as computers, printers and software (especially for students from the College of Humanities).

Due to the lack of studying spaces, students suggested making wireless Internet more accessible and provide a greater quantity of outlets to connect their laptops in the hallways and classrooms.

In about 30% of the focus groups, students expressed that the Methodology Course did not prepare them in a satisfactory manner for the completion of a research project. Also, the lack of uniformity of this course created great disparity among their writing experiences while developing research proposals. These observations relate to the need for developing better statistical and methodological competencies that many students expressed would have been beneficial while writing their thesis. The need for these skills, be them in quantitative or qualitative methods, would depend on the opposite area of emphasis that the program had traditionally developed. It is important for students to integrate these aspects more effectively into their research courses (including data management programs such as SPSS, that are now offered in separate workshops) and include hands-on experiences that allow a full comprehension of theory.

Another aspect that directly affects research is the difficulty to write in Spanish (stylistic elements), fact that was mentioned in at least 25% of the focus groups and that some students point out as the cause of their delay during this stage of research. Even though difficulties with the English language were mentioned less frequently, the poor fluency demonstrated by the Natural Sciences focus group evidenced the need to reinforce conversational English skills.

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dissertation in terms of sex, country of origin, and their part-time or full-time studies. There was no representation of handicapped students and the participation of students who were non-native Spanish Speakers was reduced.

[10] The programs of Physics, Mathematics, Social Work and Philosophy are the exception because of the availability of good bibliographical resources. For the other programs, students must compensate this critical problem by means of inter-library loans and resources provided by the professors from their private libraries.

In about 40% of the focus groups, students mentioned issues related to the absence of specifications for the thesis format, and regulations to structure its supervision and expedite the feedback process of committee members. The quantity of committee members is sometimes excessive (4 and 5 for masters and doctorates' respectively for some Natural Sciences programs) which complicated the coordination of the process and the meetings. In some programs, it is prohibited to bring mentors from outside the program or university, reducing the experience to the limited number of professors available. Students have defined research as a lonely process that gives in to frustration and exhaustion; they compensated for the isolation and need for immediate feedback with the assistance of their equals, an aspect that appeared to be one of the factors that provided the most support during the process.

On the other hand, students are not aware of the logistic and technical complexities that are inherent to each stage of their research. In consequence, they are not able to prepare in advance for the possible inconveniences. Inexperience hinders the effective planning of tasks like finding reliable transportation to the field, gathering and organizing considerable amounts of data (i.e. Biology and Linguistics) and obtaining needed authorizations to access statistical information in government agencies (i.e. Social Work and Economy).

Students expressed dissatisfaction with the time it took to submit research projects to the Institutional Committee for the Protection of Human Beings in Research (CIPSHI), whose norms are perceived as very strict. Part of the problem is the lack of knowledge concerning rules, which reflect poor attention to the topic, not only from students but also from thesis supervisors.

Finally, students put research into perspective while talking about their future plans. Students from professional programs such as the Masters in Business Administration and Communication, who entered the programs with an expectation of achieving professional and financial success, are concerned with the employability of their graduates and with the perception that the business community adopts in regard to the program. For these students, research requirements are useful if they were to assist them in qualifying for a better work position. In contrast, students from doctoral programs such as English, Spanish, and Social Work are delighted to do research. They are usually interested in developing a career in research within the educational system because they have great passion for the subject and because they value quality of life over financial positioning. Their main aspiration is to work for the UPR system, which unfortunately is against the Institution's policies of no-inbreeding. Students, who sometimes find out about this regulation too late, are forced to change their future plans at an advance point in their studies. Finally, students from the Natural Sciences doctoral programs are open to a broader range of employment and relocating possibilities, regardless of whether these provide opportunities for pure or applied research. Although the academia might still be attractive to some students (i.e. Biology, Mathematics and Physics), others (i.e. Chemistry) expressed feeling a little disheartened about pursuing a college career when learning about their professors' work overload.

2. Opportunities

Students identified assistantships and financial aid for traveling among the practices that best facilitated their research process because these allowed them to use the library during daytime hours and expand their knowledge. Some disciplines depend greatly on field studies and on debate to generate knowledge (e.g. Linguistics and History). These programs need greater support efforts and could benefit from contributions for traveling.

Universities possess a window of opportunity in the exploitation of services that promote synergy such as sharing resources, classrooms, operating permits and taking advantage of the Internet. For example, visiting faculty enriches the curriculum but it becomes onerous for the programs. As an alternative, students proposed video conferencing or online broadcasts. Inter-library loans, classified by students as a "lifesaver," are another area of potential development that might allow compensating for a scarcity in resources.

Access to Internet services such as *Library Thing* (LibraryThing.com), provide an alternative to create personal and online library catalogues that implicitly increase the Campus libraries' collections and the possibility of book exchanges between students and professors, which is already an informal practice. This in turn may favor the development of the academic community.

Students agreed that making a research assignment or any other type or research activity during the bachelors can considerably facilitate research at a graduate level. The Campus should design its bachelor's academic offerings looking forward to continuing graduate studies, and integrate research experiences into its courses and other undergraduate requirements.

The shortage of study halls limits the time students can spend in Campus, and is one of the contributing factors that diminish the quality of their work. Study halls allow for a quiet and profound reflection which is required during the research process, while meeting rooms promote group cohesion. A better organized plan that distributes course scheduling could release one or two classrooms per faculty; these classrooms could be equipped to serve as study rooms.

English students reported that courses which combined theory and writing provided a solid foundation for thesis work, and keeping a log of their readings provided for a rapid literature review and writing process. It would be appropriate to implement these strategies beginning on the bachelor level.

D. Assessment of Other Competencies

A group of programs used a variety of tools to measure other competencies besides critical thinking (see Table 2 below). For example, the Program in Rehab Counseling used its own rubrics to assess effective communication, appreciation and fostering of ethic and moral values, awareness and social responsibility, research, creation, and personal development. The program monitored its students individually with annual evaluation meetings and designed remedial plans for students with grades below the set achievement measure.

Table 2 Graduate Programs Student Learning Assessment - Methods and Instruments

Methods	**Measurement tools**
Admissions Interview EXADEP Scores GPA Scores Admission essay Course embedded assessment such as: academic essays, research papers, research projects under mentor's supervision, oral presentation of concept paper, and tests and examinations Annual performance examination Thesis evaluation: abstract, literature review, first part of the thesis, research design, Research Project Evaluation of Discussion Groups Grades of Faculty Design Tests Evaluation of Comprehensive Tests Evaluation of position papers Government Professional Certification Test Scores Exit Interview Evaluation Clinic Practicum Evaluation Portfolio Evaluation Qualitative Data Alumni Surveying	Rubric of Critical Thinking Rubric of Research Rubric to Assess Translations Competencies Interview Guide Guide for Focus Group Student Survey on Development of Competencies Alumni Survey Exit Survey

When measuring translation competencies, the Program in Translation found a possible relation between student performance in the requested Entrance Exam and graduation rates. Students who finished their degree in three (3) years were among those who achieved the highest score in the Aptitude Entrance Exam. These students, with few exceptions, also passed their Final Examination on their first try. These findings have encouraged revisions to the program's admissions criteria.

Aside from data obtained with the afore mentioned tools, the Programs in Rehab Counseling, Psychology, Social Work, Sociology, Biology, Information Science and Technology, Education and Law, incorporated into their present and previous reports data from varied sources, namely: satisfaction questionnaires to assess the program's effectiveness; questionnaires of perceived acquired knowledge,

results of progress evaluations; interviews; Final Examination passing rates; and Bar Exam passing rates, time to degree rates, and the time it takes for students to complete their initial degree requirements.

Indirect data obtained from these sources contributed to identifying ways of improving assessment plans and aspects that must be handled with priority. For example, in a study made by the Program in Psychology with graduates from 2001 to 2006, it found out that students took around five years and nine months to complete the doctoral dissertation. Based on these findings, the program figured out a plan to identify which learning related factors, if any, could be causing this delay. Using a rubric to measure research and critical thinking skills, the program discovered a significant increase in the acquisition of research skills from the admissions essay to the thesis, but there were no significant findings with the critical thinking skills. This finding demonstrates that students acquire research skills while in the program but more information is needed about critical thinking and about other factors that may be affecting the process.

V. Changes as a Result of the Diagnosis

Three quarters of the programs (75%) have adopted one or more of the recommendations that were presented in the diagnostic report. Programs have proposed a work calendar to address pending and long term recommendations.

The changes proposed by programs are mostly related to curricular improvements, the learning assessment process, support services, extracurricular activities and norms and manuals. The following are a sample of the recommendations for improvement that we could account for. The majority of them has already been implemented or is in process:

Recommendations related to curriculum and learning assessment:

- *Architecture and Linguistics:* Change curricular elements in the courses and offer workshops to develop information skills.

- *Social Work:* Create a Qualitative Methods Course to improve the preparation of methodology.

- *History, Hispanic Studies, and Psychology:* Revise program curricula paying special attention to writing learning objectives and decreasing program requirements.

- *Education:* Create workshops to develop writing, information and publishing skills.

- *Biology and Communication:* Reopen mentoring programs.

- *Comparative Literature:* Implement a second round of assessment to confirm if there is a correlation between critical thinking and the amount of time that students have been in the program.

- *Social Work and Philosophy:* Create specialized rubrics for the primary competencies or specialized areas in the program.

Recommendations related to student support services and extracurricular activities:

- *Biology, Chemistry, Physics:* Have orientation meetings to inform about the program, requirements, physical facilities, the professors' research branches, and the thesis process.

- *Linguistics:* Offer a workshop in the management of electronic resources for research and a workshop in APA formatting.

- *Biology:* Develop agreements to provide improved access to scientific literature (ABESI Program, Access to Biomedical Electronic Scientific Information).

- *Education:* Create a project of support services to increase retention among graduate students.

- *EGCTI and Linguistics:* Dedicate a volume of the program's journal to publishing students' articles.

Recommendations related to the amendment of norms and manuals:

- *Chemistry and Biology:* Amend program regulations or student manuals to include changes to the admission requirements, the Final Examinations, the thesis specifications for the format and faculty's responsibilities regarding thesis supervision.

VI. Results of Implemented Interventions

Seventeen percent (17%) of the programs completed an assessment cycle by making a second round of assessment or by evaluating at least one of the changes that were implemented. In most cases gathered data came from evaluation forms used in orientation activities of from other indirect sources like surveys, approval rates of exams, field work or thesis and time to degree rates.

Even though some professors have independently systematized the use of assessment rubrics or other measurement tools, these constitute more of the exception than the rule. Since this practice only reaches a small number of students, the findings cannot always be applied to the whole population. In

order to systematize assessment, programs may need support from expert consultants. This way it could be more certain that lessons learned through assessment will have a greater impact in the curriculum and in the teaching-learning process.

VII. Final Comments

Learning assessment has induced graduate programs to reflect about their review and decision making processes and revamp the assessment of their different components. It has moved its members to consider program operations in an organic manner, with the aim of improving the genuine program goal: learning outcomes. Among the most distinctive achievements in the acquisition process of this new culture of assessment, we could mention: the adoption of technical vocabulary used in individual meetings, presentations, and progress reports; coordinators and program directors' commitment to assessment as evidenced by their busy attendance to follow-up meetings; the empowering experience of programs when adapting the assessment plan to their interests and circumstances; verbal and written feedback offered by programs concerning implementation tools and processes; and, in some cases, the systematization of assessment. These exemplify our true accomplishment.

Likewise, the information received from the programs' learning assessment and self-evaluations has served to revise DEGI's administrative and support services and propose amendments to Certification 72 (91-92, Academic Senate), policy that regulates graduate studies. Currently, the revised Certification has been presented to the Academic Affairs Committee for their consideration. As part of this process, said revisions are being discussed in the colleges and schools who are sending their feedback to the Academic Senate.

Appendix 1

Highest and Lowest Scores Obtained by the Programs that Used the Rubric of Critical Thinking Provided by DEGI

Highest and Lowest Scores Obtained by the Programs that Used the Rubric of Critical Thinking Provided by DEGI[1]

Colleges	Graduate Programs	Identifies or appropriately formulates the problem, question or issue	Identifies and considers the influence of context and assumptions	Presents, develops, and communicates OWN perspective, hypothesis or position	Presents, evaluates, analyzes and uses data/evidence appropriately	Elaborates the argument using OTHER (disciplinary) perspectives and positions	Evaluates and elaborates conclusions, their implications and consequences	Communicates effectively
B.Adm.	Admin PhD	4.00	2.50	1.50	3.50	2.50	2.50	3.00
Archit.	Architecture MArch	3.86	4.00	4.00	3.83	2.86	3.57	4.57
Natural Sciences	Physics MS	6.00	6.00	5.00	5.40	6.00	5.60	5.80
	Physical Chemistry PhD	5.60	5.40	5.60	5.60	5.00	5.20	5.80
	Chemistry MS[2]	4.63	4.30	3.35	4.33	4.18	4.24	4.28
	Chemistry PhD[2]	4.63	4.30	3.35	4.33	4.18	4.24	4.28
Social Sciences	Economy MA	4.60	4.70	4.50	3.70	4.70	4.10	4.70
	Sociology MA	N/A	4.60	3.40	3.90	4.60	3.90	3.60
	Social Work MSW	3.64	3.00	3.43	3.07	3.07	3.00	4.29
	Social Work PhD	3.43	3.29	3.14	2.71	2.86	2.71	4.00
EGCTI	School of Sciences and Information Technology MA	5.25	4.25	4.25	3.00	3.33	N/A	5.50
Humanities	English MA	5.50	5.50	4.40	4.40	4.75	4.75	4.50
	English PhD	4.28	4.40	4.40	4.00	4.40	4.10	4.28
	History MA	5.16	5.00	5.00	5.16	5.33	5.16	4.83
	History PhD	4.66	4.66	4.66	4.50	4.16	4.00	4.66
	Hispanic Studies MA	3.60	3.80	3.80	3.60	4.40	3.60	3.80
	Hispanic Studies PhD	4.60	4.80	4.80	5.20	4.60	4.50	4.60
	Linguistics MA	4.64	4.38	3.79	4.48	4.40	4.07	4.60
	Philosophy MA	4.25	4.25	3.75	4.00	3.75	4.00	3.75
	Comparative Lit. MA	4.81	4.76	4.90	4.74	4.51	4.50	4.60
Frequency of Lowest Score		**2**	**2**	**6**	**6**	**6**	**6**	**2**
Frequency of Highest Score		**8**	**4**	**1**	**1**	**1**	**0**	**7**

Lowest score in the program
Highest score in the program

[1]These scores correspond to the evaluations made by each program on its own, using different student works and samples of different sizes. Because of this, scores between programs cannot be averaged nor compared.

[2]Scores for the Chemistry MA and PhD students are repeated because they were averaged together.

Scores that Reach Achievement Indicators while Using the Rubric of Critical Thinking Provided by DEGI [1]

Colleges	Graduate Programs	Identifies or appropriately formulates the problem, question, or issue	Identifies and considers the influence of context and assumptions	Presents, develops, and communicates his/her perspective, hypothesis or position	Presents, evaluates, analyzes and uses data/evidence appropriately	Elaborates the argument using OTHER (disciplinary) perspectives and positions	Evaluates and elaborates conclusions, their implications and consequences	Communicates effectively
B. Adm.	Admin PhD	4.0	2.5	1.5	3.5	2.5	2.5	3.0
Archit.	Architecture MArch	3.9	4.0	4.0	3.8	2.9	3.6	4.6
Natural Sciences	Physics MS	6.0	6.0	5.0	5.4	6.0	5.6	5.8
	Physical Chemistry PhD	5.6	5.4	5.6	5.6	5.0	5.2	5.8
	Chemistry MS*	4.6	4.3	3.4	4.3	4.2	4.2	4.3
	Chemistry PhD*	4.6	4.3	3.4	4.3	4.2	4.2	4.3
Social Sciences	Economy MA	4.6	4.7	4.5	3.7	4.7	4.1	4.7
	Sociology MA	N/A	4.6	3.4	3.9	4.6	3.9	3.6
	Social Work MSW	3.6	3.0	3.4	3.1	3.1	3.0	4.3
	Social Work PhD	3.4	3.3	3.1	2.7	2.9	2.7	4.0
EGCTI	School of Sciences and Information Technology MA	5.3	4.3	4.3	3.0	3.3	N/A	5.5
Humanities	English MA	5.5	5.5	4.4	4.4	4.8	4.8	4.5
	English PhD	4.3	4.4	4.4	4.0	4.4	4.1	4.3
	History MA	5.2	5.0	5.0	5.2	5.3	5.2	4.8
	History PhD	4.7	4.7	4.7	4.5	4.2	4.0	4.7
	Hispanic Studies MA	3.6	3.8	3.8	3.6	4.4	3.6	3.8
	Hispanic Studies PhD	4.6	4.8	4.8	5.2	4.6	4.5	4.6
	Linguistics MA	4.6	4.4	3.8	4.5	4.4	4.1	4.6
	Philosophy MA	4.3	4.3	3.8	4.0	3.8	4.0	3.8
	Comparative Lit. MA	4.8	4.8	4.9	4.7	4.5	4.5	4.6
	Frequency	**9**	**6**	**4**	**4**	**5**	**3**	**8**

Scores that reached or surpassed the **adjusted** achievement indicator (4.6 for masters and 5.6 for doctoral programs)

[1]These scores correspond to the evaluations made by each program on its own, using different student works and samples of different sizes. Because of this, scores between programs cannot be averaged nor compared.

* Scores for the Chemistry MA and PhD students are repeated because they were averaged together.