

POSTGRADUATE TEACHING PERFORMANCE EVALUATION SYSTEM

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Great knowledge breeds great doubts.
Aristotle (384-322 B.C.)

A postgraduate teaching performance evaluation methodology is presented starting with the design of a questionnaire applied to enrolled in the Master's in Sciences program. The evaluation instrument was divided into four sections and programmed in informatics language. Regular students answered 543 questionnaires, one per course taken during 2003 and 2004. The information was studied statistically course-by-course from a point of view both educational and psychological. The results were analyzed course-by-course taught and on an overall basis.

INTRODUCTION

One of the objectives of postgraduate education is the evaluation of its development and self-criticism of the teaching and research processes. It is vital to develop an appropriate methodology within this educational level. Teacher evaluation has various approaches, whose common points and well known generalities take place in the framework of *the what, the what for, and the how* of the *teaching performance evaluation*, Celman (2000). The three approaches in teacher evaluation are:

- *The evaluation centered on training and knowledge of the teacher*; This is carried out through written tests, with a voluntary appearance by the teacher, motivated by an economic incentive;
- *Evaluation centers on knowledge and teacher performances in the classroom and at the educational institution*; This is performed by systematic, ongoing observation in his/her performance in the classroom and triangulation processes that allow for comparing information from different actors, sources, and instruments conducted every year or semester by the institution; and
- *The evaluation centers on teacher performance at the workplace, starting with his knowledge, knowledge of being, and knowledge of doing*. This approach to teacher evaluation is conducted in accordance with the guidelines and criteria, in accordance with the educational policies of the Instituto Politecnico Nacional.

Teacher performance evaluation should be considered as one of the main policies of the educational system, and therefore, it is necessary to determine their relationship with the other educational policies of the institution. This is why the concept of evaluation should be clarified to become a participatory process that involves the highest number of actors, and previous, permanent sensitivity processes should be implemented, Cattell and Farrand (1896).

The main objective of the research is to develop a methodology of its own that allows for evaluating the academic performance of postgraduate teaching personnel in Mexico. Its particular objectives are to: i) define an evaluation instrument of teacher academic performance; ii) define the measurable academic variables in the postgraduate student; iii) define and demystify the *what, what for, and how* of teacher performance graduate student; iii) define and demystify the *what, what for, and how* of teacher performance evaluation; and iv) apply the methodology to a postgraduate teaching population in Mexico.

TARGET POPULATION

The population to which the teacher evaluation instrument was applied is the postgraduate student body of the Instituto Politecnico Nacional of Mexico. There are 22 subjects taught in this program, including 3 propedeutic, 8 mandatory curricular subjects, 3 seminars, and 8 electives of which the student chooses 2. Of the students surveyed, 19 are in the process of

preparing their thesis, and the rest are taking mandatory and elective subjects. Eighteen students of the propedeutic course were not surveyed. Each one has answered a questionnaire for subject taken, and a total of 543 questionnaires were answered in 2003.

DEFINITION OF THE EVALUATION INSTRUMENT

The questionnaire has been organized in sections, Figure 1. The first section contains generic data of the student such as *sex* with two options, *age* with four levels, *employment status* with two options, and *their form of economic support*. The second section, which concerns the educational responsibilities of the professor, covers multiple-choice questions from two to eleven, with five choices each one and reflects the teaching responsibilities of the teacher in the classroom. The choices are excellent, good, average, poor, and very poor. The third section only consists of question twelve, which only refers to the audiovisual media used. The options are written documents, oral information, slides, blackboard, markerboards, stems (pens), flipcharts, other and combined media. The fourth and final section concerned with the commitment of the teacher with the students covers from question 13 to the end of the questionnaire. The choices for questions 14 and 15 are negative, little or nothing, and the choices for the remaining questions are high, medium, and low.

NAME OF PROFESSOR: _____
 NAME OF STUDENT: _____

Data furnished by the student are confidential

IDENTIFICATION OF STUDENT

SEX M F AGE 22-25 26-29 30-33 older than 34

DOES HE/SHE WORK?
 YES NO FELLOW No Yes Specify _____

1. The professor comes to class (without being absent unjustifiably or making up missed classes).
 ALWAYS OFTEN SPORADICALLY

Choose the option that reflects the teaching responsibilities of the professor.

2. The professor explains clearly:
 Excellent Good Average Poor Very poor

3. The professor is concerned that students learn:
 Excellent Good Average Poor Very poor

4. The professor contributes to making the subject interesting:
 Excellent Good Average Poor Very poor

5. His/her classes are well prepared:
 Excellent Good Average Poor Very poor

6. The professor has presented the program and work plan of the subject.
 Excellent Good Average Poor Very poor

7. The professor has disclosed the criteria and evaluation activities of the subject taught.
 Excellent Good Average Poor Very poor

8. The professor projects a receptive attitude toward questions or suggestions by students.
 Excellent Good Average Poor Very poor

9. The professor encourages students to participate in class.
 Excellent Good Average Poor Very poor

10. Theoretical concepts are adequately complemented by examples, comments on texts, exercises, problems, projects, etc.
 Excellent Good Average Poor Very poor

11. In general, the professor's work is:
 Excellent Good Average Poor Very poor

12. What means does the professor use to announce the programs of the subjects?
 WRITTEN DOCUMENT ORAL INFORMATION ACETATES BLACKBOARD MARKERBOARD
 STEMS (PENS) FLIPCHART OTHER COMBINED

13. If the course was not entirely covered, is the material not covered furnished?
 YES NO

14. In your opinion, how much does the lack of completion affect?
 a) in academic development.
 Negatively Little None
 b) in other subsequent subjects.
 Negatively Little None

15. How often are students offered extracurricular activities?
 a) conference cycles.
 High Medium Low
 b) Non-obligatory seminars.
 High Medium Low
 c) Preparation of papers and works
 High Medium Low
 d) Laboratories.
 High Medium Low

Figure 1: Teacher evaluation instrument

ANALYSIS OF INFORMATION BY SUBJECT

The information has been statistically analyzed subject by subject and by group. The first 3 subjects belong to what is known as propedeutic courses, equivalent to courses that are intended to build a minimum level of knowledge, so that the student can: i) have the necessary knowledge to take an admission exam; and ii) meet the demand of basic knowledge of the curriculum subjects of the master's degree program. Students take none or all of the propedeutic subjects and take the admission exam. From a statistical perspective, the classical analyses were performed such as verification of information, descriptive statistics, correlations, and factorial analyses, among many other things, Casanova (2001). Only the results of a hierarchical analysis of postgraduate teacher performance are presented below:

HIERARCHY OF POSTGRADUATE TEACHER PERFORMANCE

A hierarchical classification has been made starting with the Euclidean distance to the tabular arrangement of gross data to obtain an upward hierarchization of variables, under the

criterion of aggregating minimal distance for the questions students were asked and determine their primary groupings. The demographic tree has a level index of 153 hierarchical units, figure 2. Depending on the value of the index of the optimum level at which the dendrogram has been cut, four patterns of primary behavior are clearly identified that seem to be quite obvious. The first pattern groups audiovisual means. The second pattern is the offer of *extracurricular activities* that are grouped by the *commitment of the teacher to the students*. The fourth pattern is the teaching responsibilities of the professor.

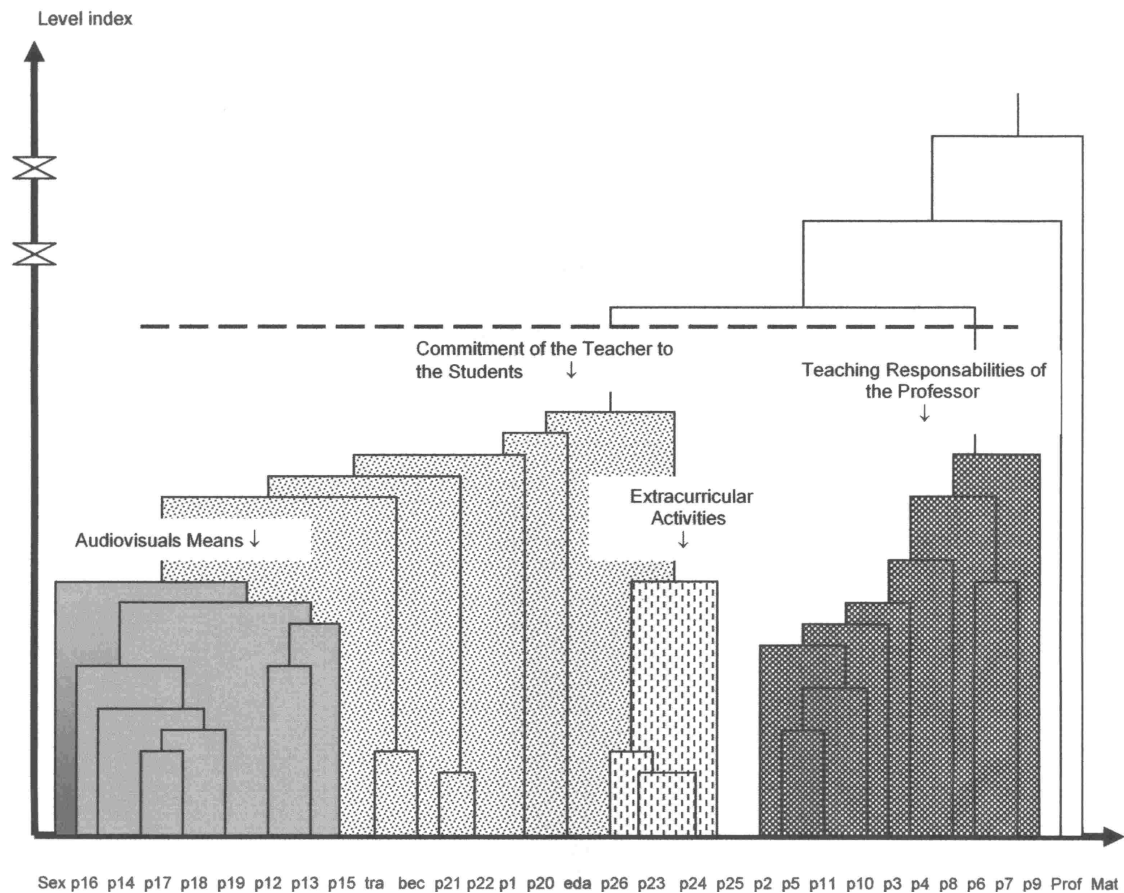



Figure 2: Postgraduate teacher performance hierarchy.
 This means a cut in the scale of the hierarchical index

CONCLUSIONS

Teacher performance evaluation methodology for postgraduate programs in Mexico, which is developed by starting with the design of a questionnaire divided into four sections and programmed in informatics language, successfully evaluates the academic performance of professors. Starting with 543 answered questionnaires, one per subject taken during 2003, the students stated that topics were poorly explained by the professors. They were concerned about not learning due to a nonreceptive attitude when students asked questions or made suggestions, due to the inability to relate theoretical concepts adequately with examples. They also made comments on texts, exercises, projects, and real problems that led them to conclude that the work done by the professor was very bad.

The correlated answers to the questionnaire state that the professor explains clearly, and are correlated to well prepared classes, and the work performed by the professor (0.85). The professor contributes by making the subject interesting (0.831) and is concerned that students learn (0.814). In addition, the work performed by the professor is correlated to his / her receptive attitude toward questions asked and suggestions made by students (0.815), thereby adequately

complementing theoretical concepts with examples, comments on texts, exercises, and problems (0.846). One correlation that draws attention is that which is recorded among didactical means to announce the programs of the subjects: markerboards and stems (pens) with didactic resources used by the professors. The multiple correlations show that the variables of the first section of the questionnaire, namely, sex, age, work, and scholarships are not correlated on a multiple basis. The same thing happens with the questions of the third and fourth sections, but the simple correlations referred to above are stated. The persons who show multiple correlation are the professor who explains clearly (0.908), is concerned that students learn (0.9), contributes to making the subject interesting (0.913), prepares his/her classes well (0.916), and complements theoretical concepts adequately with examples, comments on texts, exercises, and problems (0.942).

The main components are a contrast of the *teaching responsibilities of the professor vs. the teacher's commitment to the students, and the teacher who encourages students to participate in class through oral information and the markerboard*. Four primary behavior patterns are clearly identified from the dendrogram point of view, which seem to be quite obvious. The first pattern groups audiovisual means. The second pattern is the offer of *extracurricular activities* that are grouped by the *commitment of the teacher to the students*. The fourth pattern is the teaching responsibilities of the professor.

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