

FACTORS INFLUENCING THE PASS RATE OF COURSES IN THE FACULTY OF SCIENCES AND TECHNOLOGY OF THE UNIVERSITY OF COIMBRA(PORTUGAL)

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***Abstract-**The different courses of the Engineering “Licenciaturas” taught in the “Faculdade de Ciências e Tecnologia da Universidade de Coimbra”- Faculty of Sciences and Technology of the University of Coimbra, Portugal- show a large variation of the pass rate. It varies from a few percent up to one hundred percent. To understand the real reasons of the lower values is important in order to implement policies which can contribute for the students’ success. The “Conselho Pedagógico”- the Pedagogic Council -of the Faculty is engaged in promoting a study to correlate the pass rate to different factors and parameters. The philosophy and structure of such a study are presented. One the points to be clarified consists in getting evidence whether there is any relation between the rate of failure and the kind and type of assessment.*

*Index Terms-*Assessment, pass rate, students’ success

INTRODUCTION

The Faculty of Sciences and Technology of the University of Coimbra (Portugal) offers ten “licenciaturas” in different areas of Engineering. A “licenciatura” can be considered similar to a master degree. More than five hundred of semester courses are taught showing a large variation of pass rates. This variation goes from a few percent up to one hundred percent. The retention rate of the students is very high in some of the courses, mainly in those of the first two years. The Statutes of the Faculty imposes that for a course with an anomalous rate of failure, the reasons of such a bad result must be investigated in order to improve the global success of the students. All these courses have been subject both to a process of evaluation by the Foundation of the Portuguese Universities (Fundação das Universidades Portuguesas) and a process of accreditation by the Professional Association of the Portuguese Engineers (Ordem dos Engenheiros). Recommendations have been issued in order to diminish the lack of success of the students. So, there is general and widespread concern for

the low pass rates observed in quite a number of courses. The Pedagogic Council (“Conselho Pedagógico”) of the Faculty has deliberated to promote an inquiry which can support the understanding of the reasons and conditions influencing the pass rates of the different courses, which, as it is been said, show a very large disparity.

The aim of this paper is to present the inquiry which is now under way and to listen from the colleagues here at the Congress suggestions and comments which can improve our exercise.

IDEAS INFORMING THE INQUIRY

Before presenting the inquiry, itself, it seems appropriate to expose some of the ideas which have supported the queries laid down in the questionnaire.

About Learning

Learning is related to the mastery of fundamental principles, concepts and laws which can be used to understand and transform situations in the world of Nature and Society. This concept is in accordance with that adopted by Marton and Ramsden [1] :

Learning should be seen as a qualitative change in a person’s way of seeing, experiencing, understanding and conceptualising something in the world rather than as a quantitative change in the amount of knowledge someone possesses. Learning techniques and instructional strategies are inextricably linked to subject matter and the student’s perceptions.

Willis [2] summarizes, as a hierarchy, six student concepts of learning:

- increasing knowledge acquisition;
- memorizing and reproducing;
- applying;

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Laboratory – Individual Assessment	%
Laboratory – Group Assessment	%
Multiple choice examination (% final mark)	%
Expositive type of examination (% final mark)	%
Examination paper with questions completely new to the students	%
Open book examination	
Formulas given to the students	
Examination without any memory help	
Calendar of examinations:	
Number of days after the last examination	
Position order in the exams of the semester	

LECTURING/CLASSES

Number of attendant students at lectures :

Number of laboratory classes :

Type of given bibliography :

Interrelation between the theory and laboratory classes :

Total number of lecturing hours per week :

TYPE OF CONTENT OF THE COURSE

Abstract, with concepts and laws
Descriptive and merely informative

PREVIOUS PREPARATION OF THE STUDENTS

Pre-requisite courses :

% of the students with the pre-requisite courses passed :
Average number of credit units of the students:

DESCRIPTION OF THE INQUIRY

The questions of the inquiry are presented in four sections: a) Assessment/Type of Assessment; b) Lecturing/Classes; c) Type of Content of the Course; d) Previous Preparation of the Students. We think that the main causes which influence the pass rate can be included in these four categories. Eventually other variables also influencing the success of the students will be found during the elaboration of the inquiry and the interpretation of the data. Let explain

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and make short comments to what is meant and what we aimed at with the different questions.

Assessment/Type of Assessment

- It is believed that the existence of partial tests during the semester, approaching continuous assessment, favours good results.
- Some people think that evaluation based on laboratory work increases the pass rate.
- Eventually written examinations of the expositive type will show higher rates of failure.
- It is interesting to know whether the use of books and notes during the exam increases or not the success.
- It is interesting to know if the number of days, during the period of exams at the end of the semester, before the exam of the discipline in question, is relevant for the pass rate and which is the order of that discipline inside the calendar of exams.

Lecturing/Classes

- It is supposed that the attendance at lectures has a direct and positive impact on the pass rate.
- Also it is believed that the greater is the number of laboratory classes the greater the students' success.
- The type of bibliography, books in English or in Portuguese, transparencies, notes, must in some sort influence the students' results.
- A good correlation between the theoretical lectures and the laboratory work must be revealed beneficial.
- A too great number of lecturing hours must be detrimental to the students.

Type of Content of the Course

- It is believed that courses the matter of which is more abstract, with concepts and laws in mathematical form, show a greater rate of failure.

Previous Preparation of the Students

- It is quite expectable that the greater the number of the students with the pre-requisite courses passed the

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greater must be the pass rate observed in the discipline under scrutiny.

- It is supposed that students enrolled in more disciplines must show a lower performance.

SOME FINAL REMARKS

The failing rate of the students reading Engineering Courses at the Faculty of Sciences and Technology (Faculdade de Ciências e Tecnologia) is, more often in the two first years, higher than the acceptable, which causes too much concern. Although it is widely accepted that one of the reasons lies, both in attitudes and knowledge, in the insufficient preparation that the students entering the University have, professors and academic authorities want to invert and compensate the situation. To identify better, based in more complete and objective information, the possible causes of such state of things is the main reason of the here described inquiry. In our specific situation at Coimbra it is recommendable to know how assessment influences learning, namely deep learning.

Another reason behind this inquiry is to investigate if different types of assessment lead inevitably to different values of pass rates: while some courses have only a few percent of successful students, there are others which can get one hundred percent. What are the reasons of such high

discrepancy? Can it be, for example, that courses with assessment based mainly or exclusively in laboratory practice show naturally higher pass rates? If so, one has to think about the kind of learning achieved by the students in the different cases.

A final question is to estimate in which measure all the different kinds of assessment have their own advantages and virtues and the real challenge lies on the way of combining them adequately.

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