

STUDENT GRADING AND EUROPEAN CREDIT TRANSFER SYSTEM - RESULTS AND CONCLUSIONS

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ABSTRACT

Basic didactic requirements to student knowledge assessment during the teaching process are considered. Advantages of a 100-grade scale are discussed in the context of the implementation of the European Credit Transfer System (ECTS) in the near future. Results from the application of such a scale during the period 1998-2003 are presented. The assessment system is described and methods for transition to the ECTS and to the Bulgarian 6-grade scale are discussed. The results obtained with the system are presented, and its advantages are pointed out. The system is extremely simple and clear. It covers all aspects of students' work during the semester and their performance at the final exam. The application of the system increases students' motivation for systematic learning and satisfaction from the objective assessment of their work. The information and diagnostic value of this approach for teaching process management is demonstrated using a real-life example. Issues arising from the application of the system are discussed and possible ways of solving are proposed. The general conclusion is that the system has proved very useful for practical implementation and convenient for use with the ECTS.

Key words: grading, medical university education, ECTS, credits, 6-grade scale

INTRODUCTION

Knowledge assessment is an intrinsic part of the teaching process. Various opinions exist in the literature, however, some didactic requirements to assessment and grading seem to be commonly accepted. Knowledge assessment must be regular and systematic, covering all training aspects; it must be objective (reflecting the real achievements), fair, clear and motivated; open and understandable, etc. The most important is the objectivity requirement. There are many effects impairing assessment objectivity: the contrast effect, the sequence effect, the nimbus effect, the fatigue effect, the expectations effect, etc. (1) and, probably, the aggregate effect is most important - grading is performed relatively by comparing the individual achievements to the average performance of the group. Last, but not least - assessment and grading are important educational and psychological factors. They develop conscientious and in-depth learning habits, responsibility and self-assessment, and stimulate the efforts needed to overcome the difficult moments. The regular and systematic knowledge assessment leads to regular and systematic learning. In didactics, knowledge assessment is an impor-

tant tool for teaching process management providing valuable information and diagnostic data. Knowledge assessment is really functional, if it fulfils these basic requirements (2,3).

The objectiveness of knowledge assessment can be improved by various forms of written examination allowing for better precision - tests, point systems and scales, tables, charts, etc. Knowledge assessment should not be surprising for the students and thus reduce the psychological stress during the procedure (3). The current (diagnostic) assessment must be combined with the final (cumulative) one. Diagnostic assessment is important for better management of the teaching process, identification of issues and finding solutions, while the final assessment only fixes the results achieved (1).

One of the most important assessment strategies is the so-called criterial assessment, when the learning results are compared to a predetermined standard, and the grade shows the degree of achievement of the aims of the training process. Usually, the standard requires 60% to 100% performance, dropping in some cases to 50%, but it should never be below 50% (1).

A useful grading system is the 100-grade (numeric) system and the respective 5-grade (letter) system. It is based on various point scales, the necessary measurements being usually performed by tests (2,3). The 100-grade system is convenient as it allows easy transition to the 5-grade system, using percentage limits as criteria for the degree of student

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performance, e.g. A (excellent) for 90% to 100% performance, etc. (1).

The 6-grade system legally established in Bulgaria is traditional, generally accepted and understood. Its main disadvantage is the low number of grades (only four), representing the successful performance of the student, making it difficult to rank (stratify) the students by their individual achievements (6). How, for instance, can we determine who of the students graded as 'excellent' has performed best, and who is on the edge between 'excellent' and 'very good'? The importance of this issue rises with the necessity to join the European Credit Transfer System (ECTS) (4,5). The solution is to adopt, at departmental level, clearly understandable methods for assessment providing maximum objectivity and possibility to transform the grade both to the ECTS scale and to the national grading system.

MATERIAL AND METHODS

Based on the general didactics and docimology rules as well as on the local teaching experience, a 100-grade criterial system using a 200-point scale has been developed and introduced at the Sector of Medical Physics and Biophysics of the Department of Biology, Chemistry, Medical Physics and Biophysics, Prof. Paraskev Stoyanov Medical University of Varna in 1998/1999 for performance assessment of the preparatory year foreign students during their training in 'medical physics'. Five tests must be done during the semester covering material from the currently studied sections of the syllabus, and one final test is scheduled at the end of the semester including problems from all sections. The problems in all tests require one of three possible answers to be selected. The five current tests include a total of 100 problems, and a correct answer is evaluated by one point. The final test has 50 problems, and a correct answer brings two points. Taking into account the existing linguistic problems and trying to encourage and stimulate further efforts by the students, the criterion for success is fixed at 50%. The transition to the national 6-grade scale is done according to a linear scale: from 200 to 176 points - excellent (score of 6), etc., and below 101 points - insufficient (score of 2). This system proved successful and is in use during the last six years.

The system described above being a successful experience, a similar system has been developed and introduced in 2000/2001 for the students of medicine trained in 'medical physics' and 'biophysics'. This system covers all aspects of student work during the semester (theoretical knowledge and practical performance in the lab) and the results of the final exam. The performance during the semester is assessed during laboratory sessions indirectly evaluating the mastering of the material presented at the lectures as well. Student performance at each lab session is checked and assessed by three criteria: (a) mastering of the theoretical background of the laboratory experiment; (b) practical work, and (c) mathematical processing of the experimental data and reporting of the final results. The theoretical

knowledge is checked by a test at the end of the lab session, after discussing the main issues and performing the experimental work. The test consists of five problems. A performance of 60% (at least three correct answers) is considered sufficient to pass the test. The participation in the experimental activity (knowledge of the experimental set-up, the problems to be solved, and the methods to be used), and obtaining realistic results brings a positive mark for practical work. The experimental data, their mathematical processing, error evaluation, and the results obtained must be presented in a written report. Only reports which are complete, correct and handed in time are marked positively. The maximum number of points gained by a student during the semester is 30 and can be calculated by the following formula:

$$\text{Semester points} = 10 * (A + B + C) / N$$

where: A = number of tests passed

B = number of positive marks for practical work

C = number of positive marks for lab reports

N = total number of lab sessions for the semester.

An important feature of this approach is that passive attendance is not tolerated. Only real achievements (knowledge, skills, etc.) are valued stimulating the in-depth preparation and active performance in the lab.

The exam at the end of the semester consists of three parts: a barrier test, written examination and oral examination. The barrier test brings no points, but if failed (less than 60% correct answers) the student is not allowed to proceed to the next phases of the examination and gets a poor mark. The written examination lasts 90 minutes and the student is expected to write in his/her words brief answers to 30 questions on two topics from the syllabus selected by chance. Each correct and complete answer is awarded two points, correct but incomplete answer brings one point, and all others - zero points. Thus, the maximum number of points gained at the written examination is 60. Only students who have gained at least 51 points (total from the semester and the written examination) can pass to the oral examination. The oral examination brings additionally maximum 10 points. The final cumulative grade is the sum of the semester and examination points reflecting the level of theoretical knowledge and of all aspects of the laboratory work. The total number of points gained (out of the 100 maximum) can be regarded as the percentage of mastering the material and can be easily transformed to any other grading system, including ECTS (4,5). According to the national 6-grade system, the final grade is determined using a linear scale, with the criterion for success established at 60%, i.e. excellent (score of 6) for 100 to 91 points, very good (score of 5) for 90 to 81 points, etc., and insufficient (score of 2) for less than 61 points.

A modification of this system is applied successfully by the Sector of Medical Physics and Biophysics since 2000/2001 for the courses provided to the students at the medical colleges of the university.

RESULTS AND DISCUSSION

The introduction of this assessment system resulted in better student's motivation for regular work during the semester and confidence in the grading objectiveness. The regular and systematic assessment reflecting in the final grading everything that is learned or done correctly and in time proved to be a powerful stimulus of student's activity. It is extremely important that the system is simple, clear and easy to understand. It is open and the students are acquainted with it at the very beginning of the course. They can use it to assess their progress at every stage of the training.

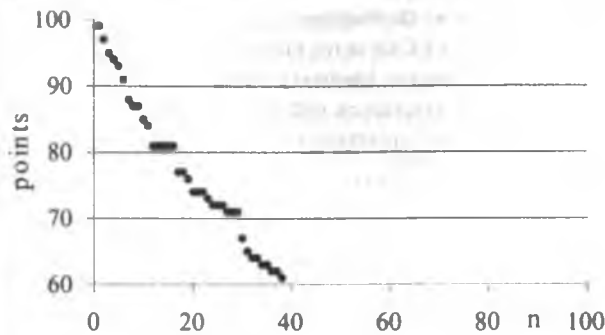


Fig. 1. Biophysics Exam - 2000/2001

We consider the 3:6:1 ratio of semester work, written examination and oral examination in the final grading to be an objective representation of the relative share, importance, and weight of these components of student's performance in our courses.

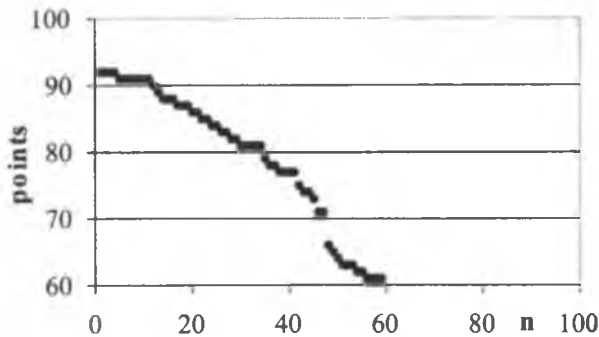


Fig. 2. Biophysics Exam - 2001/2002

If the assessment is performed on relatively small fragments of work and in the presence of the student, the probability of errors and subjective treating are minimized. For example, performance in 'medical physics' is assessed by each of the three criteria for semester work at 20 laboratory sessions, and the student is always aware why his/her knowledge or performance has been assessed high or low. After the written examination the student is able to determine to some extent his/her results, to pinpoint any errors or

omissions, thus reducing the tendency to project his/her own errors on the examiner. Ninety individual acts of student performance assessment are done before the oral examination. For the majority of the students the oral examination passes at ease and they are able to perform at their best as they already know, they will pass the exam.

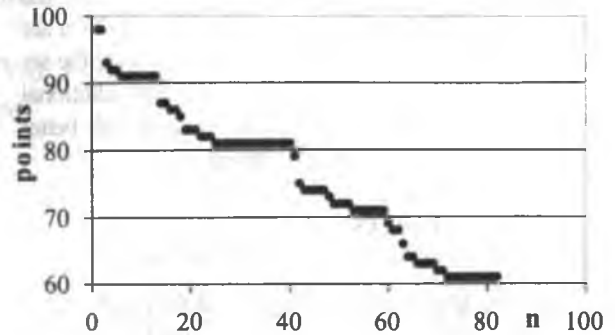


Fig. 3. Biophysics Exam - 2002/2003

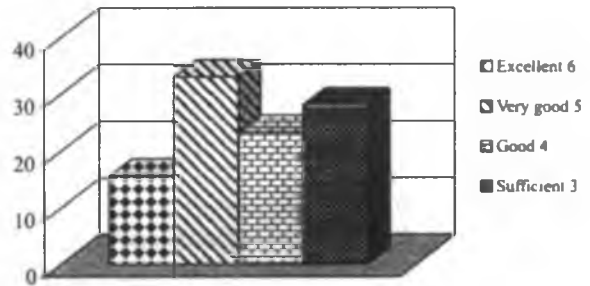


Fig. 4. Biophysics Grades 2002/2003, %

It is important to note the diagnostic value of this approach. Figures 1 through 3 show the total number of points gained versus the rank n in the list of students. An aggravating trend for awarding the minimum number of points (61, 71, etc.) for the respective grade can be observed.

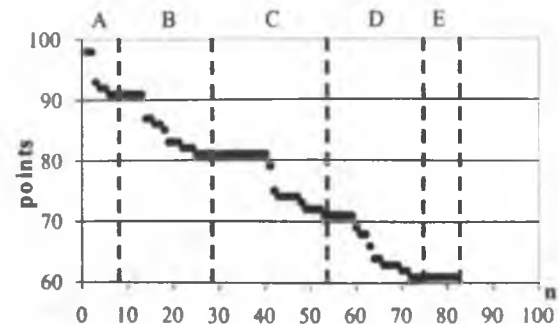


Fig. 5. Biophysics Exam - 2002/2003

This can be interpreted as a manifestation of the subjective 'indulgence effect' (1) and can not be determined from the respective histogram of grades (Fig. 4).

Organisational measures can be introduced to eliminate the effect (e.g. at each stage the examiner may not know the total number of points accumulated by the student).

Another issue is presented by the case when two or more students gain equal points (Fig. 5), thus making the final ranking in the group more complicated (5). This is very important at the boundaries of the ECTS grades, where the best 10% of the students are graded A, the next 25% are graded B, etc. (4). A possible solution is to calculate the semester points to the tenth of a point, or to adopt additional criteria (e.g. giving higher rank to the student with better performance at the written examination).

CONCLUSION

The presented system proved very useful for practical implementation and convenient for use with the ECTS. It is a step in the right direction and the remaining issues must find their institutional solutions.

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