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Current issues of teaching mathematics in economic faculties of universities

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Abstract

At the age of rapid technological development modern economy places high demand on the education of specialists of economic profile. Future highly qualified economists need serious mathematical training that would allow them to use economic-mathematical methods to study a wide range of economic problems. In this work the main problems meeting at teaching of mathematical disciplines at the universities, where mathematics is not the students' major are considered, and some solutions of these problems are offered. Also results of monitoring the current progress of students are given and the closeness of connection between the current progress and exam scores of group of students for discipline "The mathematical analysis" is established.

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*Keywords:*mathematical education; professionally-oriented education; self-directed learning; electronic resources; interactive method; monitoring.

1. Introduction

Teaching mathematics in an economic institution has certain distinctive features. This is due to the fact that most students consider an economic higher educational establishment a humanitarian one and are often not ready for a serious study of mathematical disciplines. However, the economy is gradually ceasing to be humanitarian, and economists are increasingly using economic-and-mathematical methods for analysis of economic processes and prediction of possible outcomes of economic activity (Valitov & Mardanov, 2011).

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2. Important problems

Important problems of teaching mathematics at the universities, where mathematics is not the students' major, include:

- professionally oriented teaching of mathematical disciplines;
- optimal combination between course size and its content in the context of the accepted educational standards;
- the simplicity and clarity of presentation, without prejudice to the academic style;
- persuasion of learners in the necessity of studying mathematical methods for their use in the future career.

Professionally oriented teaching of mathematics implies the need to inculcate students with the ability to assign specific economic meaning to most mathematical concepts, indicating areas of possible application of these concepts in the economy. For example, when studying the topic "derivative of function" the economic meaning of the derivative should be given along with the physical and geometrical one; study of differential and integral calculus should be accompanied by the economic analysis of derivative functions, such as total, average and marginal costs, profit function, demand, supply, etc.

In order to optimize the combination of size and content of mathematical areas, special attention should be given to designing the syllabus of the course. More complex issues should be given more study time, taking into account the need to bring them in the economic research.

Language of presentation of mathematical disciplines should be clear enough to be understood by students whose major is not mathematics. Therefore, if the presentation of the material uses quantifiers and special symbols, they should be explained. It is worth to remind students from time to time of their meaning. In addition, for a better understanding of theoretical positions it is desirable to accompany the presentation with examples of their practical application, graphic illustrations, economic and other interpretations, as well as offer students to invent their own interpretations and examples that illustrate a particular mathematical concept or theoretical position.

Since the economic institute is not involved in training mathematicians, there is no need to strictly prove all the theorems and formulas. Only the main ones need to be proved as well as those that most clearly reflect the economic process.

Having made the teaching of mathematical disciplines professionally oriented, the teacher thereby convinces students in the need to study them. That is why practical classes, tests, pass-fail exam should always include specific economic tasks.

3. Methods of realization

To solve these problems it is necessary to meet the following objectives (Berezhnova, 2006):

- clear arrangement of learners' self-study process with the use of multimedia and electronic educational resources;
- consistency of mathematical education;
- intensification of educational process by introducing interactive forms of learning;
- developing students' ability to solve arising economical problems on the basis of the mathematical knowledge received;
- comprehensive monitoring of the educational process and objective assessment of the knowledge received.

At the first lesson, the teacher should provide students with the theme and timing of future tests, reports on self-directed learning, colloquia and pass-fail exams. In addition, it is necessary to provide students with access to electronic educational resources which include tests for control and self-control. It is vital to supply each topic with home assignments, followed by discussion in the classroom.

Students experiencing difficulties in self-directed learning may seek the advice of their teachers. In this connection a clear timetable for consulting should be set with teachers outside the classroom.

One of the important conditions of learning is the consistency of mathematical education, because, if a student misses a class for at least one topic, the logical sequence and the relationship between the preceding and subsequent themes will be violated. Therefore, with a few exceptions, it is expedient to regulate the mandatory attendance of classes by students.

Intensification of the educational process is carried out by the introduction of interactive forms of learning, such as discussion of complex issues, debates, presentations, work in small groups, continuous assessment (Dvulichanskaya, 2011). Strict supervision of the teacher helps students use electronic educational resources actively.

Developing students' ability to solve arising economical problems on the basis of the received mathematical knowledge contributes to the ability of students to carry out the formulation of economic problems and on its basis to build an adequate economic and mathematical model of the set problems, as well as select and apply mathematical and economic methods, followed by an economic analysis of the obtained solution.

4. Monitoring of the educational process and assessment of the student's knowledge

Monitoring of the educational process in practical classes, monitoring of students' self-directed learning, by means of electronic educational resources as well, test papers and tests, followed by analysis of errors, monthly assessment by means of rating system allow not only to intensify training activities of students but also to assess the level of knowledge they have received.

An objective assessment of the student's knowledge according to all above mentioned points plays an important role in monitoring of the educational process. As a result of learning during the semester the student is required to aggregate a score of at least a predetermined number of rating points, otherwise he/she would not be allowed to participate in the exam.

Empirical lines of continuous assessment rating, the result of the exam and the final rating for the group of students from 21 people are presented on a fig. 1.

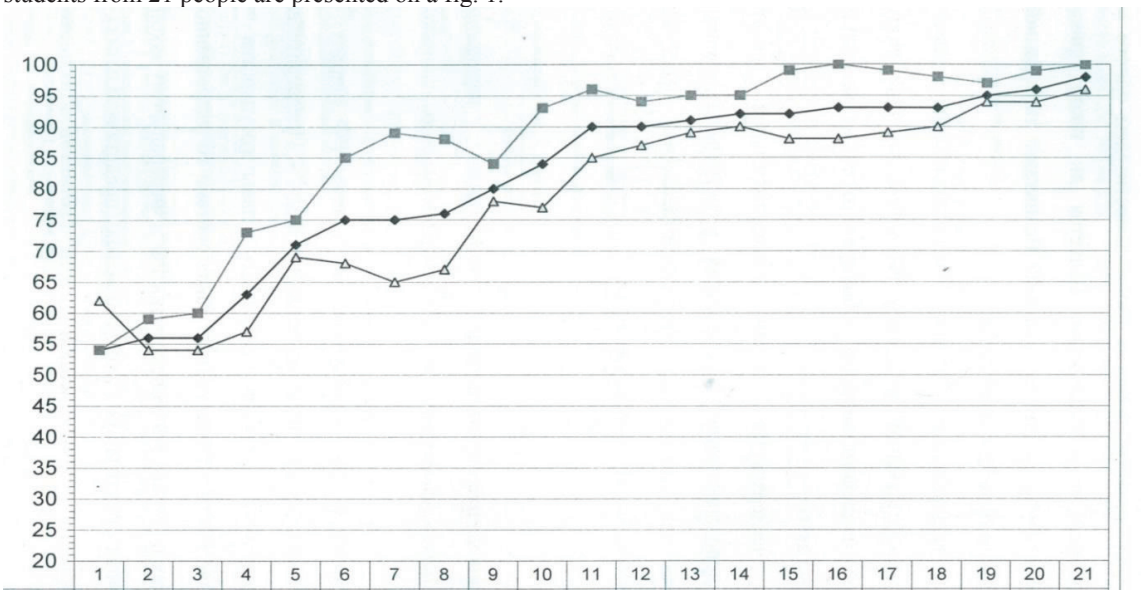

Fig. 1.

– Final rating –exam result % continuous rating %

In our research we calculated correlation coefficients of rating scores with total score, rating score with the exam score, final score with exam score.

The correlation coefficient of rating scores with total score equals 0.9677, rating score with the exam score - 0.8807, final score with exam score - 0.9695.

Monitoring and comparative analysis of the current students' progress and results of the examination in the discipline show a close correlation (dependence) between the current progress and exam scores.

This study shows that correct organization of educational process and student's self-directed learning lead to high rates in progress of students.

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