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## **The use of computer modeling in teaching the economic and mathematical disciplines to future economists**

### **Problem statement**

The progress in economics, industry and education currently depends on active use of the information technologies. In modern society computer equipment is widely used for making financial calculations by all branches of the national economy, large and small-scale enterprises, state institutions, banks and entrepreneurs without exceptions.

One of the most important elements of the basic knowledge when teaching future financial experts is studying the economic and mathematical disciplines. It is caused by the fact, that the economic analysis of concrete tasks often involves the method of the mathematical modeling, which positively results in production and commercial fields as well as in an administrative area.

The wide use of the computer equipment considerably extended the opportunities for students. Nowadays you can give them the knowledge that recently has been affordable only for high level experts.

However, the majority of works addressing the computerization of the mathematical education have covered the issues of school program or higher mathematics in technical higher educational institutions. But you will seldom find the papers dealing with a problem of using the computer technologies when professionally training future economists.

Despite the huge number of researches, the analysis of psychological, pedagogical, medical and scientific literature testifies to the absence of a complete methodical system directed on using computer equipment for teaching the economic and mathematical disciplines.

**The aim of the article** is to cover the essence of a tabular processor MS Excel and the use of it in solving some mathematical problems by the students of economic professions when studying economic and mathematical disciplines.

### **1. Presentation of the basic material**

Some changes in politics, production and education demand new approaches to economic and mathematic training of the professional personnel. There is

a lack of high level professionals, especially in economic area, who can research, analyze and solve difficult economic tasks contributing to its fast development.

Besides the huge calculating potential and possibilities of modern computer equipment and its mathematical support are not currently used in full. As a rule, PECM is only used for bookkeeping calculations, keeping reference information system and office work. Usually these activities allow the users to get rid of the processes connected with a large amount of information processing. But nowadays the use of the information technologies has not reached the point when economists, financiers, managers of enterprises and organizations could make an analysis necessary for making decisions with the help of PC; make difficult analytical calculations related to market research; imitate activity of their company considering the influence of foreign and domestic factors; analyze the possibilities for solving conflicts.

Currently Ukraine is marked by the period of setting up a new education system directed on integration into information and educational world space. This process is followed up by some essential changes in the pedagogical theory and practice of scientific and educational process. The computer technologies serve to become an inseparable part of the integral educational process that considerably increases its efficiency [Якімів 2011: 194-202].

Nowadays the students of economic professions should clearly know the basic theory, formulas, methods of solving mathematical tasks, be ready to use the economic calculations and, which is most important, be qualified users of a personal computer, existing programs and the tabular processor MS Excel in particular.

The information technologies take a special place in the training the future economists. It is explained by the fact that development of these technologies leads to the below mentioned requirements. A student should:

- work as a user on a personal computer within the integrated information system, e-mail, internet business;
- improve technological and managing processes at the working place using new technologies and software.

Consequently, one of the most important conditions for pedagogical process efficiency in higher educational institutions specializing in economics is the use of the tabular processor MS Excel when studying the economic and mathematical disciplines.

Among the number of software that could totally meet the requirements of the economists, bookkeepers, managers and other experts by its universality, availability and simplicity in its use can be the tabular processor Microsoft Excel, which is highly used by almost all the enterprises and companies in their professional activity. The tabular processor Excel allows to solve different types of difficult financial and economic tasks, and can meet the requirements of economic experts, bank officers, managers, marketers and other professionals. Con-

sidering the above mentioned, we believe it is necessary to teach the future economists how to use this tabular processor.

When studying the scientific literature, we paid attention to the fact that the use of the computer equipment in education process influences the methodical system of teaching the economic and mathematical disciplines at all levels:

- at the level of the education goal: to get the students ready for the life in the information society;
- at the level of the education content: to introduce a new applied content into such courses as *The Mathematics For Economists*, *The Economic And Mathematical Modeling* and to review the old one;
- at the level of the teaching methods: it allows to use productive and developing teaching methods in a wider way;
- at the level of the education forms: introducing such progressive education forms as collective and distributive, group and individually differential ones [ГОЛОВАНЬ 1998: 50-55].

It is also necessary to mention that the tabular processor Excel is a basic platform for creating a company information system that will consist of financial paper reports, employment and analytical working books.

The advantages of this system (comparing to 1C Bookkeeping and Sailing Bookkeeping) are:

- 1) simple service (there is no need to employ a programmer);
- 2) universal software;
- 3) simple adaptation to definite and specific company tasks;
- 4) simple implementation of the new analyzing and forecasting methods;

The information system based on MS Excel allows to use the following instruments for the data analysis and finding an optimal solution:

1. Work with formulas.
2. Work with diagrams.
3. Work with functions.
4. Work with superstructures (matching parameters, finding solutions, substitution table).
5. Work with data base. Filtrating and sorting.
6. Work with tables.
7. Work with macros.

Let us consider the use of the tabular processor MS Excel when solving tasks for the regressive analysis during the economic and mathematical modeling study process. The regressive analysis is a very effective method which is used for the research of index dependence from different factors that influence it, and shows their connection in a form of the regressive model and its relevant graphics. It can be used when making decisions in many areas starting with company financial operations and finishing with marketing research. The econometric methods with using PC allow to effectively forecast diverse economic

and social factors. For this purpose it is possible to use both standard (Excel e-tables) and specially developed programs („Stadia”, „Spss”, „Stangraphics”, „Systat”) [Погрішук 2007: 175].

## Conclusions

The use of the computer equipment during education process in higher educational institutions will allow to improve the knowledge quality, to intensify students' motivation for the education process and the future profession, to increase the use of computer equipment in teaching the mathematical and major disciplines and to ensure authenticity and objective knowledge evaluation.

When solving economic and mathematical tasks by means of the tabular processor MS Excel, the computer positively influences the students if they understand the operations the machine has done and how to make it work, that is when they understand the logic of task solving and can solve the algorithm.

We should also mention that the tabular processor MS Excel as well as the computer positively influence the students' attitude to such disciplines as *The Mathematics For Economists*, *The Economic and Mathematical Modeling*, for it makes it possible to solve diverse nonstandard tasks with its support. Consequently, the task of every lecturer is to use this students' positive attitude to computer equipment in education process, especially when solving the major tasks of the economic and mathematical disciplines.

## Literature

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## Abstract

The article surveys the use of informational technologies, partially of a table composing processor MS Excel, in the process of studying economic and mathematical subjects at faculties of economics. The advantages of the programmer in question over other similar software are analyzed.

**Key words:** computer modeling, tabular processor MS Excel, future economists.

## **Zastosowanie modelowania komputerowego w nauczaniu przedmiotów ekonomicznych i matematycznych na kierunkach ekonomicznych**

### **Streszczenie**

W artykule opisano wyniki rozważań na temat wykorzystania technologii informacyjnych oraz wykorzystanie programu MS Excel w nauczaniu przedmiotów ekonomicznych i matematycznych na ekonomicznych kierunkach studiów. Zalety i wady innych programów tego rodzaju są przedmiotem dalszych analiz.

**Słowa kluczowe:** modelowanie komputerowe, tabelaryczny procesor MS Excel, ekonomiści.