# TRAINING TEACHERS OF MATHEMATICS IN THE USE OF MODERN INFORMATION TECHNOLOGIES FOR TEACHING

**Asen Rahnev\*  &  Evgenia Angelova\*\***
PU „Paisii Hilendarski"
Faculty of mathematics and informatics, bul. Bulgaria 236, Plovdiv 4003, Bulgaria
\* assen@uni-plovdiv.bg,   \*\* evgang@uni-plovdiv.bg

## ABSTRACT

*Opportunities for incorporating modern information technologies in the training of teachers of mathematics designed to prepare them to acquire knowledge and skills for relevant selection and appropriate use of teaching methods, media and materials in the learning process to increase its effectiveness, are discussed.*

## 1. INTRODUCTION

The issue of the methods of teaching, which are not only a means for transferring and acquiring knowledge, but also a form of organization of the teaching hours, is of vital importance to pedagogics in the modern dynamic and technological world. Therefore, we seek ways to increase the efficiency of teaching not in terms of the volume of the knowledge transferred, but in terms of the degree and the nature of the impact on the mind of the trainees [1]. The realization of these aims can be achieved through using modern audio-visual and information technologies in the teaching process, which are relevant to the curriculum and to the didactics and methodology of teaching for each degree program. The Ministry of Education and Science has accepted a decree [2] which includes the "Audio-visual and information technologies" in the minimum of mandatory educational disciplines with defined horarium for the acquisition of the professional qualification of „Teacher" for people with higher education.

The aims of our training course is that students are expected to become familiar with the basic methodological principles for applying modern information technologies both for storage and presentation of educational information, and for the management of the process of education; to realize their role in the teaching

process and acquire significant skills which they can use in their future job as mathematics teachers.

The discipline „Audio-visual and information technologies" is included in math teachers' curriculum for Bachelor's and Master's degrees, conducted by the Faculty of Mathematics and Informatics (FMI) at the University of Plovdiv „Paisii Hilendarski". The opportunities for using audio-visual means are examined, starting with some common and some specific aims of mathematics education [3] – the formation of skills for creating and using mathematical models and for development of spatial imagination.

## 2. METHODOLOGY OF THE TEACHING PROCESS

From the perspective of pedagogics, the authors of the current article have selected to develop "on spot" the methodology for teaching the discipline „Audio-visual informational technologies for teaching", as well as to elaborate its curriculum. It includes „the ways of education", i.e. assimilation of the curriculum and building skills for its execution during the time period of the lesson. Different authors, e.g. G. I. Shtukina, N. A. Menchinskaya, N. I. Boldirev, T. A. Ilina, M. N. Alekseev, N. A. Sorokin independently give different definitions of education. Education is the unity between teaching (the guidance of the teacher) and learning (the activity of the student), through which the management of the inner and outer activity of the student is applied and predetermined pieces of knowledge, skills, ways of knowledge and habits are formed in the student [4], joint action of multiple subsystems [5]. To increase the effectiveness of the process of acquiring knowledge and skills, a proper organization of the learning environments is established, as well as the execution of different demonstrative means.

The development of modern technologies gives the following opportunities:

- the demonstrative means acquire a new type of education environment which provokes interest and displays the resultant from the observed objects and processes; the use of the traditional pencil-and-paper technique or sketches on the chalk board cannot achieved the effect which the new methods of visualization produce; computers with appropriate software can successfully be used in the solid geometry section, as well as in the inspection of graphs of functions, and in the examination of hypotheses;

- the traditional pedagogical methods will give, from their "old" position, a new way of organization of the learning environment. It is an interactive one, realized through the interaction and dialogue between the trainee and the education means under the expert management of the teacher. There is also an opportunity to carry out the programmed education by the active reaction of the educated persons and with every student's individual pace of learning.

## 3. CURRICULUM

By "modern information technologies" the authors understand both the information technologies including the computer applications developed, and the audio-visual means which deliver opportunities for different types of high-quality imagery. Through the computer and the internet, the audience can gain access to information in the form of text, picture, motion and sound, which engage several of the students' senses simultaneously.

The curriculum includes the following themes [6]:

Theme 1. *Computer information technologies*:

- general didactic and functional overview of the modern computer - hardware and software;

- management of portable computers for their effective usage;

- application software - word processing, spreadsheets, graphics and animation.

Theme 2. *Audio technologies, visual technologies for static and dynamic images:*

- general didactic and functional overview;

- analog and digital sound recording technology – operating principles, formats, media; requirements for quality audio output;

- slides, filmstrips; slide projectors;

- analog and digital video recording technology – operating principles, formats, media;

- camcorders; requirements for quality video output;

Theme 3. *Input and output devices - printer, scanner*:

- general didactic and functional overview – hardware and software installation;

- possibilities for use with different applications.

Theme 4. *Multimedia and telecommunication technologies*:

- multimedia projectors – overview and applications;

- operating multimedia projectors to achieve high-quality output;

- overview and applications of computer-based telecommunication technologies – e-mail, data transfer, videoconferencing systems;

- LANs and WANs – overview and applications;

- Internet – potential;

- Web page development – HTML, web editors, adding visual effects and dynamics by using JavaScript.

Theme 5. *Computer presentations*:

- general didactic and functional overview - guidelines for design and development;

- design and animation effects;

- choice of presentation style, settings.

## 4. CONCLUSION

Modern information technologies create prerequisites for the development of a qualitatively new technology for the organization of the educational process through the use of the opportunities presented by the computer system. The practical exercises included in the syllabus provide various opportunities for the students to acquire basic knowledge and skills for the right selection and appropriate use of different types of educational methods, media and materials in the process of education in order to increase its effectiveness. The training methodology employed to prepare the trainees for their prospective careers as teachers of mathematics involved the use of a wide range of audio visual equipment. This "learnability"-based methodology was found to be successful, which was confirmed by the trainees' performance in both the practical skills assessment, and the theoretical knowledge test conducted with DeTC (Distributed e-Testing Cluster) [7].

## REFERENCES

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## ПОДГОТОВКА НА УЧИТЕЛИ ПО МАТЕМАТИКА ЗА РАБОТА СЪС СЪВРЕМЕННИ ИНФОРМАЦИОННИ ТЕХНОЛОГИИ

*Разглеждат се възможностите на съвременните информационни технологии при подготовката на учители по математика за придобиване на знания и умения за правилен подбор и подходящо използване на различни видове учебни методи, медии и материали в процеса на обучение за повишаване на неговата ефективност.*