Methods for applying information technologies to astronomical education

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Методика за прилагане на информационни технологии в обучениетопо астрономия

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(Анотация на дисертация за образователната и научна степен "Доктор")

The dissertation presents the methods developed for the first time, for applying IT to astronomical education, on the basis of a detailed analysis of the didactic possibilities of IT and an analysis of astronomical education in Bulgarian high schools. A system has been created, including methodical requirements, models and directions for applying instructive computer presentations and the educational resources of the Internet to astronomical education in the 10th and 12th grades. A model has been developed for the activities of students in self-preparation through the Internet, as well as methodical directions for applying IT to astronomical education through several interactive methods.

The first chapter "Information technologies and astronomical education" presents the theoretical basis of the research - the study of the complex of characteristics and possibilities given by IT in high school education. An analysis has been made of the actual state of the problem of applying information technologies to high school education. On the basis of the increasingly prevalent informatization of education are formulated the goals, tasks and characteristics of the educational information technologies. An analysis has been made of astronomical education in Bulgarian high schools. The main goal of astronomy education has been determined - through acquiring a system of knowledge about cosmic objects, processes and phenomena, to develop the learning abilities and creativity of students.

The second chapter "Methods for applying information technologies to astronomical education" presents the developed system of methodical requirements, models and directions for applying instructive computer presentations and the educational resources of the Internet to astronomical education in the 10th and 12th grades. A model has been developed of the activity of students in self-preparation through the Internet, as well as the methodical directions of applying IT to astronomical education through several interactive methods.

The third chapter is devoted to the organization, carrying out and results of the didactic experiment "Studying the efficiency of astronomical education through IT". An approbation has been made of the developed methodical directions, the offered computer programs and the developed educational computer presentations for studying the efficiency of their application to the realistic process of astronomical education. The empirical study proves the increase in efficiency of astronomical education by using the developed methods. On the basis of known and analyzed benefits and problems, there has been created a list of suggestions, enabling in short term the transition to wider usage of IT in astronomical education.

The main contributions of the dissertation are towards the methodical foundation of astronomical education with IT and the methodical foundation of astronomical teaching in extracurricular forms of education.

The results have been generalized in 20 scientific papers.

Key words: astronomical education, educational information technologies