

PROSPECTS OF TEACHING NANOTECHNOLOGY IN THE SECONDARY SCHOOL

O.O. Pasko

Sumy State Pedagogical University named after A.S. Makarenko

It's recognized that the learning process should reveal and implement those priorities in education, recognized by society at this stage of its development. In last years the nanotechnologies takes an important place in the science and production.

Ukraine's accession to the sixth technological structure [1] and development of competitive industries can be accelerated by adapting the international experience training for nanotechnology, development and implementation in schools and universities courses of the latest achievements and problems of nanotechnology.

Comparing the educational courses explicitly seen that this issue becomes interdisciplinary. There are practically no methodological development to address the study of nanotechnology in secondary school in Ukraine. Therefore, the study of teaching issues related to the development of nanotechnology in schools is urgent now.

Scientific methods of teaching involves primarily state educational standards, curricula and training programs of educational courses. In this case, the development of regulations that would define the content of education in the field of nanotechnology, especially state education standards is a requirement of time. Implementation of these standards will meet the demand for the relevant specialists and achieve greater levels of training.

The amount of hours allocated to the students acquainted with nanoworld in teaching physics to form a complete picture of the world and prepare students for conscious perception of a fundamentally new approach to the study of the structure of the matter and the creation of new materials is precious few. One of the possible options of the partial solution of this problem may be Incorporating nanoscale science and technology into secondary school curriculum. It is including of the specific issues of nanotechnology related to specific learning material in the process of learning natural sciences using the reserve training time. For example, in the study of the wetting phenomena in physics course in secondary school students can introduce so-called "lotus effect" and gradually moving to study the properties of nano-objects [2]. However, it should be noted that the main drawback of this method of studying nanotechnology is inevitable fragmentation of knowledge of pupils and immaturity complete representations of the nanoworld. A more promising and effective direction is the development and implementation of the learning process based on nanotechnology in the form of elective courses [3]. The most effective of the course would be in the second semester of grade 11, when students already have appropriate knowledge of quantum physics. Thus, the modern methods of teaching physics appropriate to include issues related to the study of nano-objects, and nanotechnology in general.

Awareness of pupils of the educational material in nanotechnology is an important didactic problem, given the size of the objects of study. This problem can be successfully solved only in a visualization their basic features significant multimedia. Computer modeling tools allow you to create visual images of the objects and define the physical characteristics of objects and monitor their changes over time. The developed dynamic digital models based on disclosure of component-based consistency of the mathematical and physical knowledge and aimed at enabling a deep and full understanding of the nature of the students.

Hence, the contradictions that emerged today between the new needs of society for qualified specialists in the field of nanotechnology and content of traditional education system, can be resolved by implementing the learning process of secondary and higher educational institutions of the new interdisciplinary courses related to the development of nanotechnology.

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