UDC 378: 53:371.3

FORMATION OF A SCIENTIFIC WORLDVIEW AMONG UNDERGRADUATE STUDENTS OF A NON-PHYSICAL SPECIALTY

Ganiyev SardorToshmurodovich
Karshi branch of Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

https://doi.org/10.5281/zenodo.7982530

Abstract. *The developing function of the scientific worldview, providing the activation of thinking and actions, encourages students to be creative, inclined, and study in the relationship of events and actions. As a result, students develop the skills of generalizing new knowledge, creative thinking over natural and social phenomena. The article discusses the importance of applying the theory of inventive problem solving in teaching physics in the formation of students ' scientific worldview*

Keywords: *scientific outlook, student, teacher, function, formation, TRIZ.*

Currently, it is of great importance to improve the educational environment aimed at forming the scientific worldview of students. The Strategy of Actions for further Development of the Republic of Uzbekistan defines the tasks of "stimulating research and innovation activities, creating effective mechanisms for introducing scientific and innovative achievements into practice" [1]. This shows that the improvement of the didactic system of forming a scientific worldview among undergraduate students of a non-physical specialty in the context of informatization of education is becoming important.

A number of scientific studies are conducted in the world to form the scientific worldview of undergraduate students of a non-physical specialty, to establish an axiological attitude to research activities. At the same time, special attention is paid to improving the technology of developing students ' critical and creative thinking, as well as mechanisms for forming scientific and innovative thinking among students receiving education based on priority areas and ideas of pragmatic pedagogy. Based on this necessity, the improvement of the didactic system of forming a scientific worldview among students in the educational process, the definition of pedagogical and psychological features of the formation of a scientific worldview are of actual importance.

The formation of students 'worldview in the process of its socialization is connected with the fact that in the process of learning, students' worldview undergoes internal and external changes. Internal changes are caused by growth and development, when the student changes his view of the surrounding world. External changes are caused by social processes occurring in society, which have a great impact on its formation.

Worldview is the subject of philosophical research, but the problem of forming a worldview and considering its aspects has been addressed by psychologists, teachers, sociologists, and other scientists.

In our country, the problems associated with the methodological foundations of the physical worldview of the individual, its place in the life of society and the development of

personal spirituality are reflected in the research of domestic scientists M. Mirzakhmedov, M. Dzhoraev, K. Tursunmetov, N. Matzhanov and others.

In the CIS countries.Ilin, V. Kumarin, A. Usova and others. the questions of psychological bases of formation of scientific concepts and scientific outlook at students are considered.

As the analysis of scientific and methodological literature shows, despite the fact that scientific studies were conducted on the development of knowledge, skills and abilities of students, the psychological foundations of the formation of scientific concepts and a scientific worldview, the development of self-consciousness and their own points of view of the individual, however, they did not sufficiently investigate the problem of improving the formation of scientific students ' worldviews.

Scientific worldview is a holistic system of views on the objective physical world and the place of a person in it, on the attitude of a person to the surrounding reality and himself, as well as the main life positions of people, their beliefs, ideals, principles of knowledge and activity, and value orientations determined by these views.

There are different concepts of "worldview", "general picture of the world"," worldview"," worldview"," worldview". Despite the fact that there is a close connection and unity between all these concepts, and they are often used as synonyms, there are also differences between them. So, the worldview is a particular understanding of the world, reality, a system of views, ideas, while the overall picture of the world is a synthesis of people's knowledge about nature and social reality, which is the starting point and result of the worldview. The totality of natural sciences forms a natural scientific picture of the world, and social sciences forms a socio-historical picture of reality. With the help of a scientific worldview, a person builds a picture of the world of a certain era or his own, and then creating a general picture of the world is the task of all areas of knowledge.

After analyzing the literature sources, we suggest taking into account the following provisions when forming the main tasks of the university:

- to achieve understanding of the regularities of the development of nature, society and people's consciousness;

- develop students ' desire, motives and ability to act in accordance with the scientific worldview by participating in conscious labor, research and social activities;

- teach students to evaluate natural phenomena, social life and people's activities.

The formation of a scientific worldview is possible due to:

- the content of academic subjects (subjects related to the development of nature (for example, natural sciences), subjects (for example, social sciences) related to the laws of social development);

- under the influence of the teacher's working methods (including students in research work, tasks for comparison, analysis, synthesis of material) [2. p. 196].

Revealing the concept of a scientific worldview and its laws, it is necessary to take care of the application of knowledge in practice, help students in choosing a field of work and profession in accordance with the individual's vocation and social needs.

A full-fledged scientific worldview performs a number of functions. In particular:

- the educational function of the scientific worldview is that it creates an opportunity for students to fully reflect physical events and phenomena inherent in nature and society.

- the educational function of the scientific worldview is manifested in the acquired points of view, views, beliefs. They, in turn, require the assimilation of certain moral qualities in a person;

- the developing function of the scientific worldview, providing activation of thinking and actions, encourages students to be creative, inclined, and study in the relationship of events and actions. As a result, students develop the skills of generalizing new knowledge, creative thinking over natural and social phenomena;

- the organizational function of the scientific worldview is manifested in the assimilation of the initial status in the practical activity of a person;

- the predictive function of the scientific worldview is based on the knowledge and laws inherent in nature and society. In the scientific and practical thinking of a person, certain directions appear. Trends in the development of public life at the present time ensure the emergence of the idea of creating one's own future.

The system of pedagogical conditions for the formation of a scientific worldview among undergraduate students of a non-physical specialty is consciously designed by teachers and presented as an integral didactic phenomenon aimed at achieving certain didactic goals. By involving non-physical undergraduate students in research activities, the possibilities of introducing them to the world of knowledge are expanded. The knowledge acquired by students in the course of research activities is strong and deeply conscious. With their help, the scientific picture of the world is specifically reflected in the minds of students. As a result of the identification and implementation of pedagogical technologies that serve the organization of educational situations, which make it possible to form a scientific worldview of students, it is possible to effectively organize their research activities.

In the process of organizing research activities, the teacher's approach to technology is important for the student. We came to the conclusion that the use of the theory of inventive problem solving (TRIZ) in teaching physics is of great importance in the formation of research skills among students based on the results of research. The radiation is polarized. The splitting pattern essentially depends on the direction of observation with respect to the direction of the magnetic field. In this regard, a distinction is made between the longitudinal and transverse Zeeman effects. When observed perpendicular to the magnetic field (the transverse Zeeman effect), all components of the spectral lines are linearly polarized: some of them are parallel to the field B (π-components), some of them are perpendicular (σ-components). When observed along the field (longitudinal Zeeman effect), only the σ-components remain visible, but their linear polarization is replaced by circular polarization. The historical names "normal" for a simple effect and "anomalous" for a complex effect turned out to be unfortunate, namely, a complex effect is overwhelmingly common, and a simple effect is a special case of complex effect. The Zeeman effect is used in spectroscopy, in quantum electronics devices, in particular for measuring the strengths of weak magnetic fields in laboratory conditions. The Zeeman effect later found a very useful application in astronomy, since the splitting of lines in the radiation spectrum of celestial bodies can be used to judge the strength of their magnetic fields. For example, it was precisely from the Zeeman effect which astrophysicists were able to establish that spots on the Sun are considered a consequence of the disturbance of powerful magnetic fields near its surface - solar magnetic storms. A bipolar junction transistor is a three-terminal semiconductor device that consists of two p-n junctions which are able to amplify or magnify a signal. It is a current controlled device. The three terminals of the BJT are the base, the collector, and the emitter. A signal of a small amplitude applied to the base is available in the amplified form at the collector of the

transistor. This is the amplification provided by the BJT. Note that it does require an external source of DC power supply to carry out the amplification process.

Construction of Bipolar Junction TransistorBJT is a semiconductor device that is constructed with 3 doped semiconductor Regions i.e. Base, Collector & Emitter separated by 2 p-n Junctions.

Bipolar transistors are manufactured in two types, PNP and NPN, and are available as separate components, usually in large quantities. The prime use or function of this type of transistor is to amplify current. This makes them useful as switches or amplifiers. They have a wide application in electronic devices like mobile phones, televisions, radio transmitters, and industrial control.

Operation of Bipolar Junction TransistorThere are three operating regions of a bipolar junction transistor:

Active region: The region in which the transistors operate as an amplifier.

Saturation region: The region in which the transistor is fully on and operates as a switch such that collector current is equal to the saturation current.

Cut-off region: The region in which the transistor is fully off and collector current is equal to zero.

Types of Bipolar Junction Transistor

There are two types of bipolar junction transistors:

PNP bipolar junction transistor

NPN bipolar junction transistor

The theory of inventive problem solving in problem solving technologies includes practical methods for developing innovative solutions, tools, a database, and model-based technologies. The problem solution uses models of system analysis and system development.

One of the important tasks of teachers is to create convenient conditions for students ' research work. In such situations, students ' scientific worldviews are fully reflected, they master social tasks, as a result of which an effective pedagogical environment appears in the educational process.

Thus, the educational and cognitive process focused on the formation of a scientific worldview among undergraduate students of a non-physical specialty has its own specific stages, based on the practical experiences, theoretical knowledge and levels of logical thinking they have learned, and represents a didactic system aimed at forming a scientific worldview among undergraduate students of a non-physical specialty. Each specific level of the formed scientific worldview of students has its own clear signs that ensure the systematic, with the transition from one stage to another, continuous development of the scientific worldview of those receiving education.

REFERENCES

1. Jalolova P.M. Methods of atomic physics classes organization based on e-learning technologies // European Journal of Research and Reflection in Educational Sciences (EJRRES). – Great Britain, 2020. – Vol. 8, No.3. – pp. 1547– 1553. (ISSN 2056-5852) (13.00.00 №3).
2. Jalolova P.M. ICT-based teaching of quantum modeling of atomic // American journal of research. – Amerika, 2021. No.2. – pp. 20 – 24. (ISSN 2573-5624)

3. Jalolova P.M. Hydrogen atom: quantum numbers, energy spectrum, orbital impulse momentum and its spatial quantization // Berlin Studies Transnational Journal of Science and Humanities. – Germany, 2021. – Vol. 1, No.2. – pp. 1–4. (13.00.00 №1).
4. Jalolova P.M. Modelling of difficult effects belong to the physics on the basis of ICT International Journal of Advanced Science and Technology Vol. 29 No. 5, (2020), pp. 1547-1554 https://www.scopus.com/
5. Jalolova P.M. Evaluation energy of electrons in centersd(-) in Si and Ge with variational monte carlo method. Anisotropy Of the mass International Journal of Advanced Science and Technology Vol. 28 No. 15, (2019), pp. 525-532 https://www.scopus.com/
6. Jalolova P.M. Theoretical- methodological aspects of quantum physics section in the credit module system. Solid State Technology Volume: 63 Issue: 6 Publication . C.152-158 Year: 2020
7. Jalolova P.M. Calculation And Modeling Energy Levels In The Atom On The Basis Of Information Technology.
8. Jalolova P.M. Quantum mechanical models of the spectrum and orbital of the H atom. Eastern European Scientific Journal. 3-2018. -Germany, – №3. –P.430-434
9. Jalolova P.M. Quantum mechanical structure of hydrogen atom. International Conference «Science, research, development» // Berlin, 2018. –P.242-247.
10. Jalolova P.M. Application of ACT in the teaching of atomic physics. Modern views and reseach. International sceintific and practical Confrence. Yanuar-Februar.2021, England C.33-35