FORMATION OF STUDENTS' SCIENTIFIC OUTLOOK ON PROBLEM-SOLVING METHODS

Farkhod Karshiboevich Tugalov
Senior Lecturer, Jizzakh State Pedagogical Institute, Jizzakh city, **UZBEKISTAN**
farxodtugalov@mail.ru

ABSTRACT

This paper demonstrates the motivation of some concepts of physical knowledge in students majoring in physics and astronomy teaching methods, using a partial-learning method of problem - solving. This motivation is highlighted by the use of tasks and tasks used in the practice sessions.

Keywords: Problem-based learning, scientific outlook, motivation, modeling, paradigm.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Today, textbooks are systematically described in the existing textbooks on the sections of the course "General Physics", which are introduced as teaching material for students of the teaching methods of physics and astronomy. Rational thinking in physics is always based on the information obtained in practice. The structure of practical exercises on the physics course should focus on separating the learning problem and engaging the students in their active solution. A learning problem is expressed in the form of a question, question, or task that cannot be solved by a ready sample. This is where students are asked to demonstrate independence and originality.

Problem-based teaching not only promotes the development of students' thinking and creative abilities, but also shapes their scientific outlook. The use of examples in the history of science nurtures accountability, scientific courage, aspiration for truth and other qualities, and introduces ethical norms related to the development of science and its achievements, and provides a comparable moral lesson. With the increasing impact of high technology on the lives of people, this will be of particular relevance [1].
In this case, teaching the physics course will help students to develop basic qualifications: to understand the natural and scientific nature of the problem in their professional shell, to communicate, and to transfer technology (technology transfer from one region to another).

Practical lessons on the general physics course are conducted according to the following scheme using problem-based teaching methods.

1. Challenges and motivation for solving them. The motivation for creating a scientific outlook is to arouse interest in the problem-solving process, the solution of which is beyond the scope of the usual practice, which explains the unusual. Unforeseen circumstances may be the reason for the explanation of many great events in nature. This discrepancy occurs when everyday life experiences and concepts are at odds with scientific data. For example: Aristotle's conception of the character of action under constant force. If there is insufficient knowledge of the problem to be solved, an uncertainty situation is created that forces students to think about what additional conditions are needed for the solution. The motivating aspect of the technological or socio-managerial issues in production is the discovery of the relationship between the subject and the subject of future creative activity.

2. Search for a solution. The goal here is to teach the student to think analytically, summarize existing knowledge, understand the model language of nature writing.

3. Discussion. In the classical concept of measurement, a measuring device is external to the subject of the study. It cannot affect the state of a particular object by changing its properties. By selecting more precise devices, it is possible to make measurements absolute and to minimize any deviations. Motivated perception of these concepts can be achieved by addressing the following issues.

1. At sunset in the summer sunshine around Siena (present day Asuan-Egipet), the sun is reflected at the bottom of the deepest well. On the same day in Alexandria, 800 km south of Siena, the sun's rays generate $7,2^0$ angles perpendicular. Ancient Greek mathematician, astronomer and geographer Eratosfen Kirensky, who lived more than three centuries BC, used this data to measure the size of the Earth.

Under the concept of modeling, the understanding of nature consists of adequate scientific models, in the form of the accepted hypothesis that certain features of the object are consciously omitted, and those that are not significant are omitted. However, according to the concept of experimentation, any theory remains a hypothesis until facts are discovered. Motivated perception of these concepts can be achieved by addressing the following issue.

Find the mass of the Sun, taking into account the mass of Earth and the radius of the Earth's orbit, using the gravitational constant measuredby Henry Cavendsh[2]?
Which of these studies has confirmed the masses of the Earth and the Sun?

Determination of Earth and Solar masses in "rotational scales" - motivation in porodox. Here the students are excited about how this is possible, and there is a motivation for cognition: It is worth noting that what was said in theory during the discussion was confirmed by the seismic activity of the Earth and the study of the Sun's processes. The most important thing in the creation of a mechanical model of the solar system is the masses of the object that comprises it and how far they are from the Sun. It is useful to discuss the effectiveness of using a material point model to explain planetary motion.

According to the concept of object integrity, each object of nature is an independent whole with qualitative accuracy due to separate "mechanisms" of internal connections between its parts. Motivated acceptance of the concept of object integrity can be achieved by addressing the following issue.

1. Future energy can depend on the following reaction:

$^2H+^3H=^4_2He+^1_0n+17,6MeV$

Find the percentage of the mass that is converted to energy? How many tons of coal can be converted to one gram of deuterium tritium by the amount of energy released [3]?

The motivation behind the problem is the development of energy, which means that students will be exposed to the future of civilization that will depend on their future professional activities. In the course of discussion, it should be noted that the atomic nucleus as a whole system has structures that are not characteristic of its constituent elements (protons and neutrons) (mass defects, nuclear reactions).

In the Newtonian paradigm, based on the concept of space-time relations, the state of the system can only be determined by the moment in that state of time. According to Darwin's paradigm, the living organism goes through a process of individual development, carrying

information about the evolution of the species and the whole biosphere. Motivated adoption of these concepts can be accomplished in the following ways.

1. If a satellite is launched in such a way that it moves in the plane of the Earth's equator and seems to be constantly moving from the Earth's surface, then determine the distance from the center of the Earth to the satellite and its velocity to the Earth's surface. Assume that the radius of the Earth is 6400 km [4].

2. Carbon isotope C^{14} activity in old wood is 4/5 of the same isotope activity in freshly cut trees. Determine the age of the old wooden material.

The motivation here is to use the students' interest in the use of space communication technologies that have entered our lives today and to discover the secrets of the past based on the isotope method of historical events. In discussing the first issue, it is important to note that the Newtonian paradigm does not depend on the nature of the satellites to be able to orbit, and in the second case, the information about the evolution of human and biosphere in the past, consistent with Darwin's paradigm.

The motivational perception of the non-classical concept of micro-impact limit constraint, coupled with a quantum maximum effect, can be achieved by addressing the following issue.

1. The lower limit of light sensitivity of the human eye at wavelength λ=510 nm is $E = 4*10^{17}$ W light energy. How many photons per second can a person record at a given wavelength? What are the properties of animal eye structures that are more sensitive to light than the human eye [5]?

The motive here is that the events under consideration are personally relevant to each of us, that is, in the process of observing nature, the situation in everyday life is used. In the discussion, it is important to emphasize that even the most advanced optical devices have a limit of light intensity on one quantum energy.

Problems in problem-solving methodology and motivation in solving them serve not only to develop students' thinking and creative abilities, but also to shape their scientific outlook.

REFERENCES

1. DubnischevaT.Ya., Rozhkovsky A.D. 2001. Concepts of natural science in modern education // Education Philosophy for the 21st Century- №2 - p. 75 - 82.
2. Volkenstein V.S. 1992. Collection of tasks for the general course of physics. Moscow, "Science".
3. Muminov T.M., Kholiqulov A.B., Hushmurodov Sh.Kh. 2009. Atomic nucleus and particle physics. Tashkent, “National Society of Philosophers of Uzbekistan”.
4. Balash V.A. 1966. Physics issues. Tashkent "Teacher".
5. Rasulov E.N., Begimkulov U.Sh., Akhmadjanova Sh., Adashboev Sh.M. 2005. Quantum from Physics issues package. Tashkent.