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The Significance of the Principle of Organization in Teaching the Structure of the Atom and the Nucleus on the Basis of Interdisciplinary Information Technologies

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ABSTRACT: This article describes the importance of the principle of integrality in teaching the structure of the atom and the nucleus based on interdisciplinary information technologies.

KEYWORDS: atom, nucleus, chemistry, didactics, coherence, competence, quantum mechanics, photon, hydrogen atom, spectrum.

I. INTRODUCTION

The process of qualified training of a future physics teacher requires students to present the scientific foundations of a physics course, continuity and consistency in the presentation of lectures on atomic and nuclear physics in different periods of study. In the modern theory and practice of education, research is being carried out to determine the ways and means of enhancing the cognitive activity of students. When improving this process, it is important to apply general inductive rules, in particular the principles of continuity and consistency.

II. ANALYSIS AND METHODOLOGY OF THE LITERATURE

The essence of the continuity principle is as follows: in the process of transition from one state or stage to another, some elements or parts of the overall system are preserved. Consistency in the process of scientific knowledge is associated with the principle of adaptation. In didactics, it is understood that the next stage is organized on the basis of the previous stages. In addition, this means that school teachers organize the content of their functional activities. In this sense, continuity means that during the transition from one type of education to another, the basis (core) of physical knowledge should be preserved and developed [1]. It should be noted that the application of the principle of integrity requires taking into account the invariant (unchanging) principles of the methodology along with the process of improving the knowledge, skills, abilities and competencies of students.

The principle of connection of theoretical knowledge with practical skills, abilities and competencies is based on the doctrine of the unity of the theory and practice of knowledge. The application of this rule is one of the main tasks of physical education in a general education school. Physical education in it, along with providing students with deep knowledge in the field of science, should teach them to understand the concepts and laws of the structure of the atom and nucleus, to realize the unity between them [2,3,6].

Summarizing the above, consistency can be defined as follows: “Systematicity in learning is the relationship between the stages of development of knowledge, skills, abilities and competencies. The knowledge gained at the initial stage of training is stored and used to acquire new knowledge at the next stage. Old and new knowledge are united and become one whole, that is, the whole. Thus, the above points confirm the importance of ensuring the integrity of physical education in the process of teaching students. Therefore, in order to highlight the didactic foundations of this principle, it is necessary to determine the essence of the principle of consistency in the philosophical, physical culture and educational process. In the history of philosophy, the problem of coherence was first elucidated by Hegel. In the process of developing the law of negation of negation, he proved that negation is not

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only the elimination of the old situation, but also that something from the former is preserved in the new situation and is a necessary basis for its future development.

Integrity as a philosophical category is a connection between the elements of the complete stages of being and cognition, and its essence lies in the fact that parts of the whole are preserved in the process of change as a system. Consistency links the past with the future and ensures the stability of the whole. Therefore, in modern philosophy, integrity has a single interpretation: integrity is the fact of preserving some elements of the previous state of a new thing that arose in the process of development of material objects.

What is the role of coherence in physics? A striking example of the application of the principle of continuity in physics is the principle of adaptation. Since this idea is of great importance in interpreting the formal development of quantum mechanics, we will briefly review the history of its origin.

III. DISCUSSION AND RESULTS

The main challenge was to understand the relationship between quantum and classical physics. M. Planck's law of radiation was based on the discreteness of energy, which contradicted classical physics. The definition of the law required a departure from the framework of classical physics. In addition, Planck's formula for the spectral density of energy radiation includes the limit states of the Rayleigh-Jeanns and Vince formulas. The Rayleigh-Genesis formula is based on classical principles, i.e., the law of equal distribution of energy in space. Therefore, the formula of M. Planck has not gone too far from classical physics, but within certain limits it is compatible with the existing laws of electrodynamics.

The introduction of photons by A. Einstein restored the corpuscular theory of light. But since the concept of speed is included in the photon energy formula, it was impossible to talk about the exchange of the wave theory [2,3].

N. Bohr's postulates were also based on the ideas of M. Planck, improved by A. Einstein and applied on the basis of special laws. Its main purpose is not to interpret or confirm these postulates, but to test the ability to explain them [5,6,7].

Based on Bohr's theory, the spectral regularities of the hydrogen atom are explained. Applying this idea to multi-electron atoms expands its scope, but also clarifies the connection with classical physics. His monographic work "On the Quantum Theory of Radiation", published in 1916 [3], led to a shift in this direction. In this monographic work, A. Einstein determined that the probability of emission and absorption of radiation by a body with a certain acceleration is similar to an electrodynamic system.

Bohr's postulates showed that Planck's formula can be derived for the spectral density of energy radiation. It is here that A. Einstein first considers the spanton and induced transitions and introduces the concept of the probability coefficient. But here the ideas of probability have not acquired significance in quantum theory. A. Einstein used the probability coefficients of the process of transition from one stationary state to another. The result is a sense of similarity between new and old ideas, apart from minor adaptations. Until now, it was believed that the adaptation of boundary transitions is characteristic only of particles, but now it is also associated with speed.

It is this assumption that makes the correspondence relation a powerful heuristic principle. Despite the fact that there is a big difference between the classical and quantum mechanisms of radiation, relying on it, you can create a copy of the quantum mechanism. This situation is the result of a new step by N. Bohr - the concept of constructive compatibility of the elements of the mechanism. Based on this correspondence, several results have been achieved with the emission of atoms in quantum theory. The phrase "principle of compatibility" was first used in the 20s of the 20th century. When developing the quantum theory, N. Bohr applied the principle of compatibility in the process of radiation of atoms, and on its basis, in 1921, the periodic law of D. I. Mendeleev was explained.

The principle of relativity seems to act as a bridge between classical and quantum physics. From a philosophical point of view, the compatibility principle justifies the development of physical theories not on the basis of mutual exclusion, but on the basis of the fact that they rely on each other. In this interpretation, the compatibility principle can be considered as a natural science proof of the dialectical doctrine of relative and absolute truth [4,8].

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IV. CONCLUSION

In conclusion, it should be said that the concept of unity in opening a wide path to modern knowledge, improving the education system, reflects the objectively existing development in nature, society and thinking, describes the links in development and the development of links. Since didactics is a theory of teaching and learning, it must describe the development of these processes. Therefore, coherence refers to didactics, which is a didactic concept;

- Since unity is a philosophical concept, it is associated with the categories of philosophy. For didactic research, it is important to analyze the connection in such concepts as “integration and generalization”, integration and interdisciplinary connection, “integration and systematization”;

- since development has quantitative and qualitative aspects, based on the connection between the concepts of connectivity and generalization in knowledge, it is necessary to look at the types of connectivity in accordance with the level of knowledge development. Therefore, this method can be applied to didactic research;

- connectivity is the methodological basis of psychological, pedagogical and didactic research work.

Based on the above conclusions, the following definitions of continuity can be given: continuity in education is the connection between different stages of the development of knowledge, skills, abilities and competencies. At the previous stage, the acquired knowledge is preserved and new knowledge is consolidated.

Sufficient mastery of probabilistic-statistical concepts not only expands the horizons of students, but also effectively contributes to the formation and development of their scientific worldview. This also testifies to the organic nature of their development. It enhances the formation of students' skills of probabilistic-statistical thinking, which occupy a major place in their practical activities.

Students get acquainted with probabilistic-statistical representations first at mathematics lessons (grade 6), and then at chemistry and physics lessons. The process of their practical application is visible in the lessons of chemistry and physics The division of the program materials into general physics, general chemistry and professional knowledge in the departments of taught physics and chemistry;

- include materials related to school courses in physics and chemistry as part of professional knowledge and create the possibility of applying the principle of connectivity to them;

- general physical and general chemical knowledge, educational materials for the school, not directly related to the courses of physics and chemistry, but without which it is impossible to acquire professional knowledge; development of a suitable methodology for teaching probabilistic-statistical representations and requirements for its mastery;

- holding seminars on courses in physics and chemistry, conducting optional courses and demonstrating the presence of the principle of consistency in the study of probabilistic-statistical representations and concepts at different stages of education.

Experience shows that such teaching of physics and chemistry not only creates the opportunity for a comprehensive and in-depth study of probabilistic-statistical concepts and concepts, but also the practical application of the didactic principle forms students' skills, qualifications and competencies.

This method not only improves the quality and efficiency of teaching physics and chemistry, but also increases students' interest in these subjects. At the same time, uniformity is achieved in the formation of the structure of the atom and the nucleus among students of physicists and chemists.

REFERENCES

1. Звягин А.Н. Совершенствование систематизации знаний учащихся в процессе обучения средней школе. Автореферат дис.… канд. пед. наук. –Челябинск, 1978.
2. Каноков З., Караходжаев А.К., Насриддинов К.Р., Полвонов С.Р. Атом ва ядро физикаси. Лаборатория ишлари. –Т.: “Ўқитувчи”, 2002.
3. Бор. Н. Научные труды, В 2-х т. –М.: «Наука», 1971.
4. Раджабов У.А. Принцип соответсвия в физических теориях. Физическая теория. –М.: “Наука”, 1980. –164 с.
5. Юсупов, Ш. Б., & Сайтджанов, Ш. Н. (2021). ФИЗИКА МАСАЛАЛАРИНИ ЕЧИШДА МАТЕМАТИКАНИНГ ЎРНИ. Журнал Физико-математические науки, 2(1).
5. Бекжонов Р. Атом ядросивазарралрфизикаси. –Т.: “Ўқитувчи”, 1995.
6. Разумовский В.Г., Бугаев А.И. ва бошқалар. Ўрта мактабда физика ўқитиш методикаси. –Т.: “Ўқитувчи”, 1990.
7. Мирсалихов, Б., & Сайтджанов, Ш. (2022). ЯДРО НУРЛАРИНИ ТИББИЁТДА ҚЎЛЛАНИЛИШИНИНГ АҲАМИЯТИ. Involta Scientific Journal, 1(3), 129-135.

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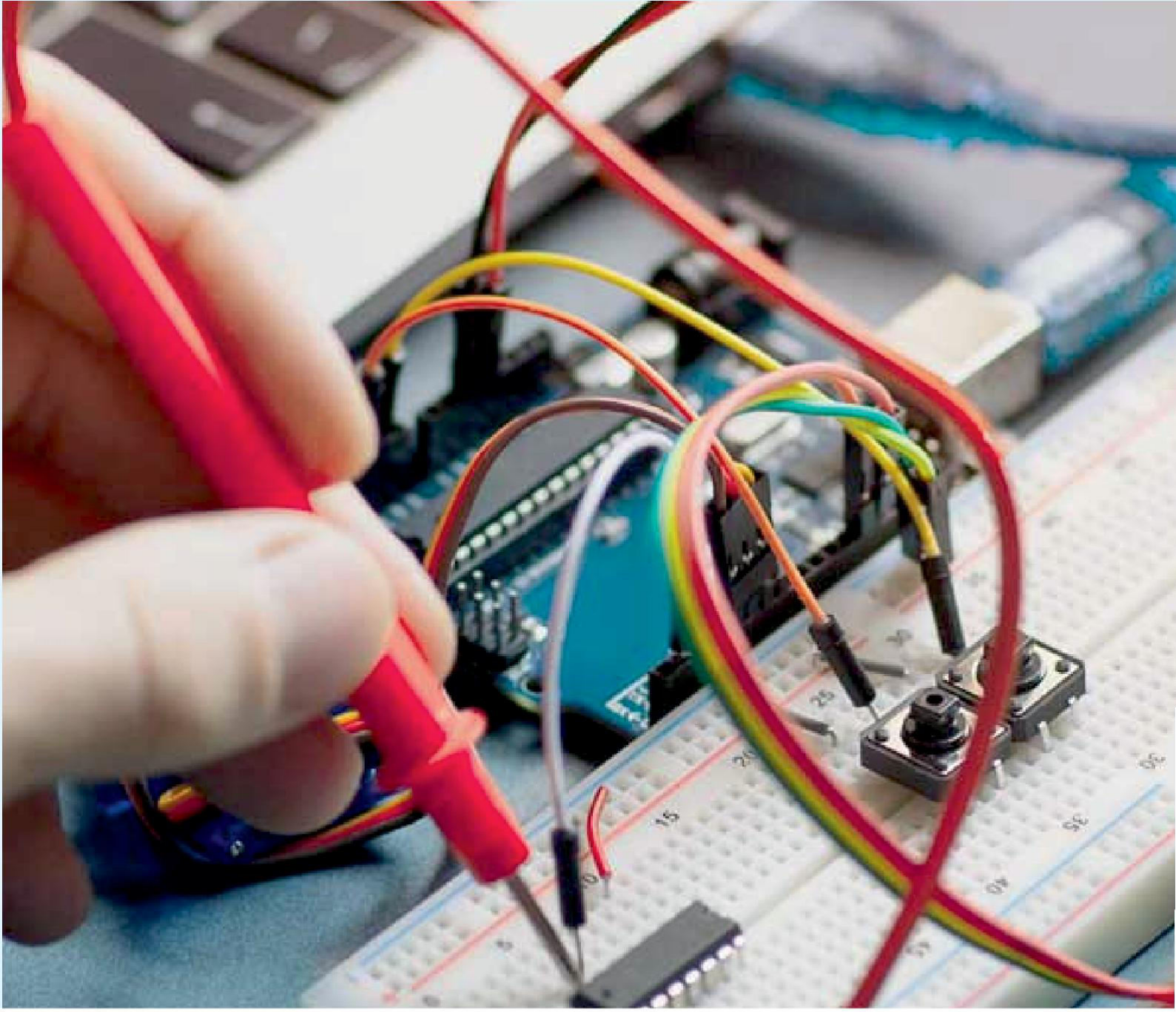
8. Мирсалихов, Б. А., & Сайтджанов, Ш. Н. (2021). РАЗДЕЛЕНИЕ ЯДРО УРАНА. ИСПОЛЬЗОВАНИЕ МЕТОДА «КЛАСТЕР» В ОБУЧЕНИИ «ЦЕПНОЙ РЕАКЦИИ» SEPARATION OF THE URANIUM NUCLEUS. USE OF THE «CLUSTER» METHOD IN TRAINING «CHAIN RESPONSE». М75 Молодежная наука: вызовы и перспективы: материалы, 357.



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