

# Methodological and Didactic Problems of Applying the Principle of Coherence in Teaching Physics

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**Annotation:** In this article presented methodical aspects of increase of efficiency of teaching physics in the higher technical educational institutions, and also examines the didactic conditions of use in the educational process to ensure intra-subject continuity between theoretical and practical knowledge.

**Key words:** method, knowledge, skill, training of technology, activity, principle, education, upbringing.

In the years of independence, the fundamental reform of the continuous education system, the introduction of advanced pedagogical technologies and the improvement of educational efficiency were raised to the level of state policy. The formation of new types of education, determination of its content based on its purpose, development of new educational programs and creation of a new generation of educational literature require a new approach to the problem of ensuring coherence between types and stages of education in our people. Therefore, in the following years, one of the main tasks facing pedagogy was to provide a scientific basis for ensuring the integrity of the types and stages of education.

Today, teaching theory and methodology are required to be implemented based on didactic principles, including scientificity, demonstrability, comprehensibility, coherence, compatibility, and consistency. Teaching physics in higher education institutions requires students not only to have deep knowledge of modern knowledge, but also to master the basic physical concepts and concepts and to clearly imagine the coherence between them at different stages of education. In secondary schools, the physics course teaches students to approach the analysis of phenomena mainly from the perspective of determinism. And the theoretical side of the matter is not given enough attention. But the structure of material objects cannot be described in depth without theoretical concepts. In particular, the study of the structure of matter from an atomic-molecular point of view is carried out only on the basis of statistical laws. In order for students to thoroughly master the scientific foundations of the physics course, it is necessary to ensure consistency between theoretical and practical content in the teaching of "Physics". However, in practice, it is difficult to say that this issue is adequately resolved in the process of teaching physics in higher educational institutions. The main place in the physical worldview of most students is occupied by dynamical laws, and insufficient attention is paid to theoretical ideas and concepts.

The main reason for these shortcomings is the failure to apply the didactic principles of compatibility and coherence in the teaching of the general physics course in higher educational institutions, as well as the failure to take into account the coherence of the content and methods of education at different stages of physics teaching.

The principle of connection between theory and practice is based on the unity of theory and practice in the process of scientific knowledge. Its implementation in the process of teaching physics in higher educational institutions is an important task of the methodology of teaching physics. Teaching physics in higher education requires a deep understanding of modern knowledge by students, thorough mastering of basic physical concepts and laws, and ensuring their coherence at different levels.

In modern educational theory and practice, research is being conducted to determine ways to activate students' cognitive activities. It is important to apply the principle of integrity in improving this process.

Pedagogical and scientific sources define the concept of "integration" differently. Integration is an important quality that expresses the organization of the educational process based on a

certain sequence, and it ensures the strengthening, expansion and deepening of the knowledge, skills and competencies that make up the content of the previous stage of educational activity at a certain stage [1, 2, 4].

Integration is a complex process and has philosophical, pedagogical and psychological aspects [2, 3]. In particular, philosophically, the category of "integration" is closely related to the category of "development", and its essence becomes clear when comparing it with the category of "movement". Integration reflects the general and important connections that apply to all developing phenomena and processes, and determines the presence of the old in the new.

From the point of view of development, continuity is interpreted both as a process of quality changes and as a transition from one level to another in order to create a new quality. Integration refers to the development of the results achieved in the previous stages. It is known that the organic relationship between old and new knowledge is based on the law of negation of dialectics. According to him, the new, without completely denying the old, includes its important parts, and also defines the areas of its application and turns the old into a classic or traditional one.

In the history of philosophy, the problem of coherence was first illuminated by Hegel. In the process of developing the law of negation of negation, he proved that negation is not only an elimination of the old situation, but also that something from before is preserved in the new situation and it is a necessary basis for future development.

Coherence connects the past with the future and ensures the stability of the whole. So, in the philosophy of the present time, integrity is the preservation of some elements of the previous state of the newly created thing in the course of the development of material objects.

Integration in psychology is the study of complex laws of psychological development, age-related changes; gradual assimilation of knowledge; considered within the scope of the change of leading types of activity.

In the above-mentioned pedagogical literature, coherence is explained as follows:

1. Didactic principle (as a basic rule defining the content, organizational forms and methods of the educational process).
2. Conditions (as conditions that help to organize the educational process effectively).
3. Motivating force (as conditions that help to organize the educational process effectively).
4. As a mandatory requirement in the process of education, development and training [8].

In education, integration is used in two ways. First, the coherence between the stages of educational types. In this case, the content of the next type of education partially repeats the previous one, and continues in its next types of education, being organically connected in terms of content. Secondly, coherence between academic subjects. This is usually done through interdisciplinary or cross-disciplinary communication.

In our opinion, coherence refers to the systematic placement of the educational material in a certain sequence, the reliance on existing knowledge in the acquisition of knowledge, the use of the educational material in subsequent stages to a certain extent, the continuity of the stages of the educational process. This helps in the placement of educational subject materials and the effective selection of activities for learning the basics of this subject. In this process, it is important to take into account the following two factors, namely:

- the content and logic of a specific subject (concepts, laws and arguments that make up the content of the subject, actions that ensure the gradual disclosure of the essence of specific field knowledge acquired before and after, based on a certain sequence);
- the conditions of the process of acquiring knowledge (action, action that does not allow the direct assimilation of the knowledge of a certain field, which has not been processed didactically, into the academic subject).

Pedagogical scientists have given different definitions to the concept of unity.

For example, B.G.Ananov defines the concept of "integrality" as follows: "Integrality in education is the development of the system of knowledge acquired by students in the process of mastering the basics of science in terms of time" [1].

According to Sh.I. Ganelin, "integration is the practical application of the existing knowledge, skills and abilities that are the basis for the educational material studied by the students, and the

development of perspective, based on which various connections between knowledge are created, the main ideas of the course are revealed, old and new knowledge interrelationship is ensured, as a result of which the students develop a thorough and deep system of knowledge".

According to S. L. Rubinstein, the essence of coherence is that each stage of the teaching process is based on the previous one, forms its internal conditions, and there is an interaction between all stages.

Thus, the concept of coherence is associated with the principles of systematicity and sequence by most researchers.

In addition, a number of scientists' researches reveal the essence, components, elements, types, stages, implementation procedures, opportunities, organizing tools, ways of providing, principles, implementation mechanisms and methodological aspects of the concept of integrity in education.

A.M. Pyshkalo defines the problem of coherence as 1) intersubject coherence; 2) coherence within the subject; 3) shows that it is possible to learn in the form of coherence between educational stages.

A.V. Batarshv developed a three-component pedagogical system of integrity, which includes: integrity in personality formation, integrity in educational content, integrity among educational forms, methods and tools.

The resolution of contradictions in the learning-cognitive process is manifested as a mechanism for the realization of continuity in education: the continuity in the learning and learning process is reflected in the implementation of inter-subject and inter-cycle connections, and the continuity in education is the continuity of the learning and learning process as a necessary condition for the creation of new knowledge [5, 6].

Most of the time, when researchers mean consistency, they understand the consistency of educational content and deal with the problem of curriculum consistency. The same process is repeated in the period of educational reform. It is true that the choice of educational content is also important in ensuring the integrity of education. There are many resources available on the selection of educational content, all of which aim to overcome the above-mentioned shortcomings. The choice of educational content is based on the following three:

- compliance of educational content with the level of modern science and production and the basic requirements of the developing democratic society;
- taking into account the unity of substantive and procedural aspects of education;
- is reflected in the principles of forming the content of education at all levels in a whole structural structure that takes into account the personal development of the student.

I.P. Podlasy points out the principles of humanism, scientificity, sequence, historicity, systematicity, connection with life, comprehensibility as principles of formation of educational content [7].

According to M. Yusupova, the effectiveness and complexity of education is the choice of content for each stage and their reflection in the textbook:

- 1) the scientific nature of the content, the coverage of the main aspects of the science;
- 2) consistent sequence and integrity of concepts;
- 3) it is focused on fulfilling the pedagogical and psychological requirements, that is, the formation of the student's personality is taken into account;
- 4) interdisciplinary and intra-disciplinary needs;
- 5) is determined by the implementation of such principles as the educational value of the selected content.

The definition of integrity in education in the above approaches shows the universality and versatility of integrity. Although various solutions to the problem of consistency and its provision are shown in the scientific works of researchers, this problem is updated with the change of the educational system or the content of education, with the increase of the society's need for physics education.

It should be noted that the application of the principle of integrity requires taking into account the invariant principles of methodology along with the process of improving students'

knowledge, skills and qualifications.

The principle of connection of theoretical knowledge with practical skills is based on the doctrine of the unity of theory and practice in the cognitive process of philosophy. Applying this rule is one of the main tasks of physics education in secondary schools, academic lyceums, vocational colleges, and higher educational institutions. Physical education in them, along with providing students with deep knowledge in the field of science, should also teach them to understand physical concepts and laws, and to perceive the unity between them.

Therefore, the above points once again confirm that it is important to ensure the integrity of physics education in the process of teaching students. Therefore, in order to illuminate the didactic foundations of this principle, it is necessary to determine the philosophical, physical and educational essence of the rule of coherence.

## Literature

1. Ananiev B.G. On continuity in education. - M.: Pedagogy, 1952.-276.
2. Akhliddinov R.Sh., Ibragimov Kh.I. Scientific-pedagogical foundations of ensuring continuity in the general secondary education system // Proceedings of the Republican scientific-practical conference on the topic "Current issues of improving the continuous education process". -T., 2004.-B. 9-12.
3. Bershadskaya M.D. et al. On the continuity of educational programs at different levels // Innovations in education. - Moscow, 2002. - No. 5 -C 45.
4. Yearbook SM. Theoretical Foundations of the Continuity of Secondary and Higher Schools in the Conditions of Lifelong Education. Abstract diss ... doctor ped. Sciences, - Moscow, 1990.-31 p.
5. Kustov Yu.A. The role of the principle of continuity in the pedagogy of higher education // Modern Higher School. - Moscow, 1998. - No. 1 (61).-S. 63-76
6. Mubarakov A.M. The principle of continuity and school education //Standards and Monitoring in education. - Moscow, 2003.-№2,-S. 30-32.
7. Podlasy I.P. Pedagogy: a new course: a textbook for students of higher educational institutions. In 2 volumes. - M.: Humanitarian ed. center VLADOS, 2003.- T. 1. - 576 p.
8. Shodiev D. Continuity and coherence in the educational system // Development of education. -Tashkent, 2001. - #3-4.-B. 39-40.