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## INTEGRATION IN THE TEACHING OF PHYSICS AND ASTRONOMY IS A MEANS OF HUMANIZATION OF EDUCATION

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**Abstract:** The article deals with the role of integration in the humanization of educational material, the integration of knowledge, the humanitarization of education.

**Key words:** Humanitarization of education, integration, differentiation, humanitarian potential, process of education, education of the subject, methodical bases.

### INTRODUCTION

It is known that in ancient times, human knowledge of nature and society seemed undifferentiated, and an encyclopedic character was acquired. Later, the knowledge that covered different areas, a sharp increase in the number of scientific facts, led to the differentiation of knowledge. During the formation of Natural Sciences, this process became especially acute. However, in the second half of the 19th century, as a result of the development of Science and technology, the need for a process of reintegration of knowledge was felt.

In recent years, the integrated teaching of subjects, the development of the characteristic features of this teaching have been considered one of the pressing issues of Education. Before expressing an opinion on the integral teaching of subjects, it is advisable to dwell on the meaning of the words “integration” and “integral”. An Integral is an integer that is viewed as the sum of infinitesimal numbers. And integration means the addition of certain fragments or elements to each other and the transformation into a single whole. Integration – (from the Latin word “integratio”), which means rebuilding, restoring, filling (“integral”–complete, whole, holistic), “integration” – developing in a interconnected way, “integrirovat” - combining into one whole, giving the meaning of making whole.

### LITERATURE ANALYSIS

To date, many Methodist scientists have conducted research on integrated teaching of subjects. They also gave similar opinions and definitions on the concept of "integration". In particular, L.N. Tarasov defines integration as "a tool that brings the knowledge of subjects closer to a common platform in creating a holistic vision of the environment." N.S. Svetlovskaya said that "integration is a method of organizing several educational subject materials on the basis of their natural subordination to the task and single goal of the methodology", Yu.M. Kolyagin - "integration is the highest level of interdisciplinary connection, a complex problem based on general methodological principles" as a way

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of learning", and V.N. Zverev defines it as "integration is the process of creating an integral connection, integrity".

In the same way, many definitions have been given by others, taking into account its similar qualities, which reflect all the methodological aspects of the integrative approach in education.

### **RESEARCH METHODOLOGY**

As early as 1860, the German naturalist, the famous educator E. Rosmesler (1806-1867) reflected on the integration of natural and historical education, arguing that on the basis of the worldview lies a holistic, whole-looking understanding of nature. And that is why, separately obtained educational subjects (physics, biology, astronomy, chemistry, geology, etc.), as early as the initial stage of their study, said that they should be recommended to students in such a way that they appear sharply connected with each other.

Also from the Great Classical educators Ya.A. Komensky, F. Yunge, Dj. Dewey studied the pedagogical and psychological foundations of an integrative approach in education. Ya.A. Pedagogical aspects of integration and differentiation based on harmony in nature were covered by Komensky.

### **ANALYZES AND RESULTS**

It is known that by the 17th century, differentiation in science resulted in two directions – natural and humanities. Despite the occurrence of such a separation, the reflection (or vice versa) of the achievements of the Natural Sciences in the humanitarian literature continued and reflected the scientific worldviews of those times.

In the Integrative Organization of education, just as the unity of integration and differentiation is from important principles, in the humanitarization of education, the unity of integration, differentiation and humanitarization is an important principle. It is known that integration and differentiation, from the point of view of philosophical views, they are calculated from the categories that clarify each other, indistinguishable from each other.

In this respect, the term differentiation is also used to refer to differentiation (fr. differentiation, lot. differentiation – separation, difference, differentiation) is a term that refers to the separation, division, stratification of parts of a whole into different parts, forms, types, stages, mutual differentiation, separation, stratification of parts of a whole. The scientific justification for it began with the scientist Spencer. Even today, teaching education on the principles of differentiation and integration has not been overlooked by professionals. In this, the principle of the development of the educational process from simple to complex is relied on.

The process of integration of knowledge has discovered another common law that applies to the process of cognition. In other words, as a result of the development of scientific and technological progress and the deepening of knowledge related to them, it is necessary that all sciences, such as biology and physics, physics and chemistry, comprehend phenomena and processes in every possible way, their known nature in the study of the process and integrating the knowledge gained in the sciences, it was possible to Modern integration implies deep and robust knowledge of phenomena and processes in nature, reflecting another important feature of the General Laws of the process of cognition[3].

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The lack of generalization of the knowledge of educational subjects, the dispersion in them, the strengthening of educational aspects of Education, does not fail to show its negative impact. In particular, in the formation of a scientific worldview in students, their ecological, aesthetic cultures, neglect of the integration of knowledge is considered from serious defects in the formation of the personality of students. In particular, in the formation of young people as a moral mature person for society, almost all educational subjects have their place. However, it is considered a pity that in almost natural - mathematics lessons, good attention has not yet been paid to arm students with such valuable knowledge.

How to organize the integration of knowledge in education to solve such an important modern problem today? What are the characteristics and terms of use of integration that differs from intersubject communication? What are its advantages? When it comes to the integrative approach to teaching, what method should the teacher consider, how should he understand its implementation in education? What is the role of integration in the humanization of education? The answers to these questions play an important role in solving this problem.

It is worth noting that, first of all, we understand well that integration is the teaching of different subjects, which are used in connection between subjects, from being taught in a mutually agreed upon way, to the level of their strong interaction. must

It is known that such exposure of subjects is carried out at different stages of education. Such a connection is covered to a certain extent in the methodological literature, and at its initial level, in the lessons of certain subjects, concepts, imaginations and images related to other subjects are involved, in other words, knowledge related to other subjects in the volume of a certain subject asset is used. In this case, for example, every physics teacher, "chemistry in physics classes", "biology in physics classes", "art sciences in physics classes", "physics in astronomy classes", "mathematics in astronomy classes" "literature in astronomy classes" etc. it is necessary to concentrate on the problem.

How can these disciplines be related to each other in the matter of "Literature in Astronomy Lessons"? - is a natural question. This question can be answered as follows. For example, in the artistic works of O. Yaqubov ("Treasure of Ulugbek"), P. Kadirov ("Starry Nights"), O'. Hoshimov ("Sun Scales", "Quasars", "Between Two Doors"), one of our poets A. In the poetry collections of Oripov ("Harmony of the Years"), Kh. Khudoyberdiyeva ("Loyalty"), the beauty of the starry sky, the beauty of the crescent moon (new moon) and the full moon, our living planet Earth is a unique gift of life. that it is a celestial body (A. Oripov's poem "Dwarf planet") is praised many times. Creating interesting problems based on these materials and recommending them to students, or using them as didactic materials in teaching astronomy will give effective and positive results. Natural phenomena, including astronomical phenomena, the relief of celestial bodies, the structure of the Solar system are embodied in the eyes of students as part of the existing beauties of nature, and they arouse great interest in these phenomena. When studying the basics of astronomy, turning to the astronomical content of works of art and science fiction is one of the principles of humanizing astronomical education. Therefore, integration in the teaching of physics and astronomy is embodied as an important tool for the humanization of astronomical education [4].

At this point, we found it necessary to clarify the idea of "humanitarianization of educational content". This idea can be interpreted in two ways: First, the humanization of educational content means the application of methods developed in natural sciences in social sciences. This situation is related to figurative thinking[1].

Secondly, the content of optional natural-scientific subjects (including physics, astronomy, chemistry, biology, etc.) has a strong humanitarian content, as well as social-humanitarian subjects, and it is not obvious at first glance. In the teaching of natural sciences, any approach related to the manifestation of the "hidden" content of humanization in them, that is, organization by using all the tools, methods and forms necessary for this, is called the humanization of natural sciences (including astronomy). , it plays an important role in the full implementation of educational and developmental functions, which are the most necessary today [2].

In the 70s and 80s of the last century, Methodist scientist Y. P. Levitan explained the issue of humanizing astronomy education at school.

In recent years, many articles on the humanitarianization of education have been published by well-known Methodists: V.G. Razumovsky, L.V. Tarasov, Academician B.V. Rauschenbach, N.N. Paltishev, Ye.P. Levitan, Fesenko, M. Mamadazimov and others. These articles provide many valuable ideas and guidelines for humanizing education. Various examples and reasons are given as evidence that the purpose and essence of humanitarian education is the most important tool that humanizes natural sciences (physics, astronomy) and thereby forms the worldview, moral-aesthetic and ecological cultures of students.

In transitioning to the next more perfect level of the integration process in teaching, as opposed to simple inter-subject communication, the teacher should, firstly, use the methodological principles that form the basis of modern natural sciences for the teaching process in all subjects, and, secondly, In its essence, it means looking at complex problems that require the involvement of knowledge gained from various subjects.

In this case, among the general methodological principles used in education - the fundamentality of probability laws and the principle of symmetry are the most important principles.

Now, when considering complex (interdisciplinary) problems in education, as for the issue of an integrative approach, one of the most important of such problems is environmental problems. At the same time, when environmental problems for human life (sudden climate change due to the process called "greenhouse effect", ozone hole, energy crisis and demographic crisis and other dangers) are raging, greening of school subjects, in other words, strengthening their ecological content the need arises.

Especially when considering the environmental problems related to energy shortage in physics, the relationship between the environmental problems of our planet's atmosphere and biosphere, which threaten life on our planet due to climate change, history and other social subjects, and, in labor education, global environmental problems (atmosphere and pollution of the hydrosphere, depletion of the ozone layer, deforestation, changes in climate conditions, etc.) and the formation of practical views related to their solution. In other words, it is necessary to improve the environmental culture of students in order to solve environmental problems.

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Another such complex problem is the problem of the effect of solar activity on the Earth. Solar activity combined with its influence on the Earth's atmosphere and biosphere, not only physics and astronomy, but also mathematics, biology, chemistry and geography and other such blims need to be involved.

### **CONCLUSIONS**

It is not difficult to understand that integration in education can also manifest as an important catalyst in the development of new pedagogical technologies, including humanitarization, computerization and informatization of Education.

In conclusion, the idea of integration in education demonstrates that there is sufficient practical work on the organization of classes in harmony with the idea of humanitarization of Education. In particular, it assumes a rethinking of the structure and content of educational subjects (primarily related to Natural Sciences), the development of qualitatively new generations of new textbooks and manuals.

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