



Methodological Foundations of The Use of Integrative Technologies in The Teaching of Biology in Academic Lyceums

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Article History	Abstract
Received: 08 June 2023 Revised: 21 Sept 2023 Accepted: 10 Dec 2023	<i>This article describes information about the use of integrative technologies in teaching biology in academic lyceums. The use of integrative technologies in teaching biology prepares the ground for the development of students' intellectual activity, the development of intelligence, and the development of a scientific worldview in the formation of competencies related to science. Case studies, trial and error, brainstorming, test tasks are formed with the aim of assessing the knowledge, skills and competencies acquired by students, scientific and technical competencies, information processing, analysis, synthesis, comparison, abstraction used in teaching biology. ideas are put forward that summing up, concluding and finding a solution to an educational problem will allow us to put forward new ideas.</i> Keywords: Electronic Educational Resources, Natural Sciences, Multimedia Presentations, Internet Resources, Electronic Encyclopedias, Didactic Materials, Video, Audio, Information Technologies
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1. Introduction

В данной статье представлена информация об использовании интегративных технологий в обучении биологии в академических лицеях. Использование интегративных технологий в преподавании биологии готовит почву для развития интеллектуальной активности учащихся, развития интеллекта, развития научного мировоззрения при формировании компетенций, связанных с наукой. Кейс-стади, метод проб и ошибок, мозговой штурм, тестовые задания формируются с целью оценки полученных студентами знаний, умений и компетенций, научно-технических компетенций, обработки информации, анализа, синтеза, сравнения, абстрагирования, используемых в преподавании биологии. выдвигаются идеи, что подведение итогов, заключение и нахождение решения учебной проблемы позволят нам выдвинуть новые идеи. Ключевые слова: Integration, competence, basic competence, technology, computer-based education, traditional teaching, cognitive, conceptual, interoaction, synectics, thinking.

The problem of forming competencies of students on the basis and science through the adaptation of the country's educational system to the processes of sustainable development and modernization of lash, the active application of innovative ideas, integ linked technologies to the educational process is of relevant importance today. Structural measures are being carried out to form and further strengthen the modern material and technical base of Chunonchi educational institutions, to benefit from it wisely, which include high-performance training-laboratory, computer equipment and other information and communication. Competence as a novelty in education does not arise at once. To do this, it is required not only educators, but also students to simply apply knowledge in practice, to bring their own abilities as a person to the surface, to overcome external and internal obstacles. In order to implement a favorable strategy, it is necessary to ensure systematicity and integrality in all branches of the continuing education system. It is up to the students themselves to solve this problem and effectively implement knowledge integration. The issue of integration of Biological Science in different areas of modern education in the field of teaching methodology and analysis of scientific literature in the field of didactics is recognized as one of the pressing problems of the pedagogical process. In particular, in the academic Lyceum and the general system of Secondary Education, the creation of mechanisms for integrating subjects, the identification of its pedagogical and didactic foundations and the solution of the problems of its implementation into practice are becoming a requirement of the time.

Integration is of great importance in the universe, in the life of society, in marriage and in production, in education, from the microworld to the macroworld. Integration is a very broad concept of meaning. In particular, the scientific worldview of the younger generation, the need for an integration process in education in the formation of their ecological, information culture are noted by scientists around the world. In pedagogical studies on ensuring interdependence in academic disciplines, it should be viewed as an opportunity to have a pedagogical influence on the developing person, embodied as an independent direction of research. Special attention is also paid to the educational significance of inter-academic involvement in research carried out in recent years. In the pedagogical conditions in which inter-educational communication is provided, it is necessary to highlight the place of the teacher in the implementation of educational activities in the process of teaching.

An integrative approach implies the development of knowledge, skills, competencies and experience taken from different disciplines, accounting, reliance, unification and competencies in times. In the disciplines of the psychological category, all human-specific thought operations form a large number of thought strategies as a holistic part of cognitive activity, and combine systems of different levels and descriptions through synthesis. Integration is differentiated from the point of view of the holistic synthesis of the parts that lie on the basis of the cognitive mechanism, as well as the strategies of cognition, and as a result, the intended goal is achieved. On the basis of the extensive introduction of science, technology, engineering, art, mathematics-based (STEAM) education in the world, the implementation of integrative technologies in the process of teaching natural sciences, including biology, the effective application of international assessment programs for the development of natural-scientific literacy in students to the educational process, the introduction of "computer education" into educational practice, it sets the task of implementing an integrative approach in an information and educational environment. Integrated technological approaches serve to highlight the general description of all social processes, as well as to determine their prospects. The process of teaching biology in academic lyceums and general secondary schools follows the principle of continuity in the study of the basics of science by students, integration of pedagogical and information technologies in the organization and conduct of the educational process, today is a requirement of the period. The application of integrated technologies in the educational process depends on a number of didactic, methodological and cognitive factors. The process of formation of integrative knowledge is formed on the basis of a cognitive, conceptual, integrative model in three directions.

Table 1: Directions of the process of formation of integrative knowledge

Cognitive	Conceptual	Integrative
Interaction-reader the perception of the knowledge acquired on the basis of their individual capabilities with integrative motives for their own inner dun. Synecletics-a lay educational- cognitive activist carried out in various disciplines Yati conceptual generalize the properties of traction. Coherence-integrative and flexible didactic processes are basically one another of all elementary principles in the science of the technological category in sequence with scientific- cognitive positioning.	Conceptual-Tar of science hi aspect, evolution-on development stage settings, experiments, modern development trends	Horizontal - disciplines (physics, chemistry, geography, biology). Diagonal-inside the fan (physics, biology, chemistry and x.k.). Vertical tech: pedagogical, information- communication cross-sectoral: nonotechnology, cybernetics, biophysics, biochemistry.

Interactionism is considered the student's acceptance of the knowledge he is mastering based on his individual capabilities with integrative motives into his inner world. The thinking of students plays an important role in this process. In the formation of competencies regarding the base and science in students, the thinking of the individual serves as an important basis. Thinking is considered a high form of human mental activity, intelligence, conscious behavior, in this process, such as thought, reflection, idea, hypothesis are formed in a person and are expressed in his mind in the form of

concepts, judgments, conclusions. As a result of the processing, generalization of information collected in memory, thinking arises conditions for predicting, predicting the development, improvement of events. The use of integrative technologies in the teaching of biology prepares the ground for the development of the scientific worldview of students' mental activity, development of intelligence, orientation towards conscious behavior in the formation of competencies on the base and science. The test tasks, formulated with the aim of assessing the competencies of the case-study, actual and mental attack, acquired knowledge, skills and abilities of students, science, used in the teaching of biology, make it possible to advance new ideas through information processing, analysis, synthesis, comparison, abstraction, generalization, conclusion, finding a solution to an educational problem.

Synergetics is a generalization of the conceptual features of educational and cognitive activities carried out in various disciplines. In certain types of activity, this process is also called "Integration". In the study of Biology in courses 1-2, a diverse body of knowledge merges into one scientific and cognitive direction. Synergetics-the ability to synthesize new qualitative knowledge of different plans (of different quality and of different modalities). It did not have any general correlation of human abilities (river flow, Human Flow, Information Flow, etc.k.) are based on their simultaneous thinking in different processes.. In the teaching of biology, natural science ideas, laws and concepts and methods of scientific knowledge are used, which are interconnected in the fields of natural sciences: physics, Informatics, chemistry, biology, geography, based on the content of the topic under study. For Example, A Branch. In the study of the subject of the internal structure of the stem, the stem tapkibi is characterized by its characteristics, with the science of chemistry, and in the study of its function, the laws studied in physics are used. The use of knowledge, skills and qualifications learned by students in the Natural Sciences in a new situation corresponds to the rules of Synergetics.

Coherence assumes that integrative and adaptive didactic processes are largely scientifically-cognitively located in sequence with each other of all elementary principles in the biological sciences. Also, the development of Applied Sciences, the emergence of differentiation and integration processes between disciplines as objective laws, requires the implementation of an interdisciplinary connection between disciplines such as biology, chemistry and physics. Coherence is the movement of small systems in consistency in the process of making the structures of new systems resistant, orderly. In teaching, coherent integration is the most common type of integration in the learning process in the current period. The coherent model is offered in general secondary education: in integrated courses such as biology and chemistry, biology and technology, biology and physics. On the basis of such integration, on the one hand, the formation of holistic visions of nature, culture and the world of science is achieved, while on the other hand, learning time is saved. Such integration makes it possible to study not only inter-biological disciplines (vertical), but also interdisciplinary (horizontal) important natural-scientific and cultural phenomena synchronized, to highly intensify the pedagogical process, to establish meaningful interdisciplinary connections, not to copy educational material.

2. Conclusion

In conclusion, the use of integrative technologies in teaching biology in academic lyceums is important in the development of students' competencies on base and science, the implementation of their theoretical knowledge into practice.

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