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WAYS TO IMPROVE THE QUALITY OF TEACHING SPECIALIZED DISCIPLINES THROUGH AN INTERDISCIPLINARY APPROACH IN PRACTICAL PHYSICS CLASSES

Abstract: *the article explores ways to enhance the quality of specialized subject teaching through an interdisciplinary approach in experimental physics education. It discusses the history and application of interdisciplinary teaching, as well as the philosophical meaning of the terms «inter» and «disciplinary.» The article explains the philosophical foundations and characteristics of the interdisciplinary approach, compares its similarities and differences with the integrated approach to subjects, and discusses the various forms of interdisciplinary approaches and their application in different fields.*

Keywords: *physics education, experimental session, interdisciplinary approach, forms of interdisciplinary approach.*

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ЗНАЧЕНИЕ МЕТОДА МЕЖДИСЦИПЛИНАРНОГО ПОДХОДА В ПРОЦЕССЕ ИНТЕГРАЦИИ ФИЗИКИ И СПЕЦИАЛЬНЫХ ПРЕДМЕТОВ ЧЕРЕЗ ПРАКТИЧЕСКИЕ ЗАНЯТИЯ

Аннотация: *в статье рассматриваются способы повышения качества преподавания специализированных дисциплин через междисциплинарный подход в экспериментальном обучении физике. Обсуждаются история и применение междисциплинарного обучения, а также философское значение терминов «ин-*

тер» и «дисциплина». Автором объясняются философские основы и особенности междисциплинарного подхода, проводятся сравнительные анализы его сходств и различий с интегрированным подходом к дисциплинам, а также обсуждаются различные формы междисциплинарного подхода и их применение в различных областях.

Ключевые слова: преподавание физики, практическое занятие, междисциплинарный подход, формы междисциплинарного подхода.

The interdisciplinary approach is one of the most commonly used teaching and research methods nowadays. An interdisciplinary approach is the principle of combining knowledge, methods, and points of view from different scientific fields and studying a problem, topic, or research in a broader and more complex context. Nowadays, more interdisciplinary approaches are used to better understand problems, find new solutions, and promote innovation. Julie Thompson Klein, who has worked at academic institutions such as the Universities of Michigan and Wayne, is one of the leading educational theorists, especially in the field of interdisciplinary research. In his opinion, «Interdisciplinarity has become the motto of change in the 21st century» [1].

This approach not only allows for a more complete and in-depth understanding, overcoming the boundaries between different fields, but also allows you to combine different points of view, making modern methods of research and education more effective and efficient. This method contributes to the development of society by strengthening cooperation in the fields of science, education and the social sphere in order to more effectively solve the complex problems of modern society. Synonyms for the word «interdisciplinary» can include «multidisciplinary», «broad», or «diverse» for those who cover multiple areas of academic research. These alternatives highlight the breadth of their research interests and their ability to contribute to knowledge in various fields. «There are different types of interdisciplinarity: multidisciplinary, interdisciplinary, and transdisciplinary».

An interdisciplinary approach is a methodology aimed at achieving a broader and more comprehensive understanding through the use of multiple scientific and academic fields. The main ideas of this approach are as follows:

- An interdisciplinary approach allows for a broader understanding of a topic or process by combining ideas, theories, and methods from different fields. For example, in research training, you can collect information from different fields and gain a comprehensive understanding of the topic using different points of view.

- An interdisciplinary approach encourages collaboration and knowledge sharing between different fields. This approach makes it possible to understand and solve complex problems in a broader context, combining scientific knowledge from several fields, rather than just knowledge from one field.

- This approach helps to evaluate a problem or topic from different perspectives, find new solutions, and expand scientific knowledge. Deeper analysis is carried out by combining several scientific methods and knowledge.

- It is the most interdisciplinary field, combining many disciplines such as physics, chemistry, biology, mathematics and computer science. Physics combines knowledge and approaches from various fields in research aimed at understanding natural phenomena. An interdisciplinary approach to physics teaching ensures that students study the material from a broad perspective, develop analytical thinking skills, and apply effective approaches to solving real-world problems. This approach creates a more inclusive and effective learning environment that meets the requirements of modern education. There are several forms of this approach:

1. The project approach

Through projects combining physics, chemistry, biology, engineering, and social sciences, students apply knowledge from different fields to solve a problem. For example, a project related to energy production may combine the principles of physics, engineering, and ecology.

Students develop interdisciplinary thinking by developing projects related to real-world issues such as environmental and energy production issues.

Projects provide students with the opportunity to creatively consider a problem from different perspectives and present new approaches.

2. Experiments and practices

Practical application: Laboratory work and experiments are conducted to learn how physical principles are applied in real life. Students study physical laws through real-world experiments.

Interdisciplinary experiments: collaborative physics and chemistry experiments such as the physical effects of chemical reactions or ecosystem research with biology.

Analytical thinking: Students develop the skills to draw conclusions by collecting and analyzing data.

3. Seminars and discussions

Expert participation: Seminars with experts in physics and other sciences help students understand different scientific points of view.

Exchange of ideas: Discussions among students develop their analytical thinking and critical assessment skills.

Research development: Seminars provide a platform for discussing the results of various scientific studies.

1. Interdisciplinary courses.

Courses combining disciplines such as physics, chemistry, biology, and engineering provide students with the opportunity to explore a topic from different scientific perspectives.

These courses develop an interdisciplinary approach by discussing specific issues.

2. Simulations and modeling.

Students study connections with other sciences (for example, economics and ecology) by modeling physical systems.

Computer modeling demonstrates the application of physical principles in other fields (for example, in climate models).

An interdisciplinary approach to teaching physics allows students to better prepare for solving real-world problems by developing analytical thinking, collaborative and creative skills. This approach provides a methodological approach that meets the

requirements of a modern learning system. The sequence of an interdisciplinary approach in the form of a project can be implemented in the following stages: topic selection, research planning, project implementation, results analysis, presentation preparation, presentation implementation, evaluation and comprehension, dissemination of results [2].

An interdisciplinary approach is applied in the education system by connecting and integrating different disciplines. For example, co-teaching subjects such as history, geography, and economics (such as those related to Azerbaijan) creates conditions for students to develop a broader and deeper worldview. This approach helps students develop various skills such as analytical thinking, creativity, and problem-solving abilities.

The interdisciplinary approach is the result of a natural need resulting from the unification of various fields, and is of great importance in education, science, the business world, and other areas of society. This approach encourages creativity and innovation by solving complex problems.

References

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