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IMPORTANCE OF INTEGRATION OF INFORMATION TECHNOLOGIES IN NATURAL SCIENCES

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Abstract:

The article talks about the integration of information technologies in natural sciences and its importance.

Keywords: information technologies, natural sciences, integration, communication.

AXBOROT TEXNOLOGIYALARINING TABIIY FANLARGA INTEGRATSIYASI AHAMIYATI

Sobirova Mahliyo Dilmurod qizi
Axborot texnologiyalari kafedrasi o‘qituvchisi Muxammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti Nurafshon filiali

Annotatsiya:
Maqolada axborot texnologiyalarining tabiiy fanlarga integratsiyasi va unin gahamiyati haqida gap borgan.

Kalit so’zlar: axborot texnologiyalari, tabiiy fanlar, integratsiya, kommunikatsiya.

Introduction

In-depth teaching of interdisciplinarity in natural sciences education is important in preparing bachelors with professional competence. Interrelationships with a number of disciplines can be observed in the research of interdisciplinary issues on the basis of information technology in many subjects of chemistry, biology, and medical education. For example, modeling, computational methods, algorithm theory, programming, computer graphics, Web design, computer science, differential equations, matrix theory and other disciplines. The research of interdisciplinarity with the help of information technologies is based on the triad of model-algorithm-program. This trio brings a complex interdisciplinary problem to a computational problem. First, the characteristic parameters describing the event and process and then the unknowns that need to be found are determined. First, a model is created that expresses the relationship between the characteristic parameters and the sought-after unknowns.

Often, this model consists of algebraic, transcendental, differential, integral and integrodifferential equations. Their main feature and complexity is that the model is not linear

in most cases. In some cases, there is a need to improve the model in order to ensure a complete description of the considered process. Then, a calculation method is selected that allows to effectively solve the model on computers, and an algorithm for solving it is developed. At the next stage, a computer program is created for the algorithm, choosing one of the modern programming languages. And finally, numerical calculations are carried out on a computer using the capabilities of information technologies, and the obtained results are analyzed, and the results of calculations corresponding to the model that adequately describes the phenomenon or process under consideration are expressed in tables and graphs using graphic and design tools of modern information technologies. In this way, software is created that fully covers the above-mentioned stages and allows research of interdisciplinarity in natural sciences, and is presented to teachers and students of higher education institutions [1].

It is focused on the research of interdisciplinarity in natural sciences

The need to create software arises due to the following circumstances: firstly, the limited ability to fully demonstrate and explain interdisciplinarity to students in a traditional way; secondly, the fact that the teacher who passes the subject of interdisciplinarity is often limited to his main specialty and does not have sufficient knowledge and skills of subjects related to interdisciplinarity; thirdly, the extreme complexity of observing interdisciplinary relationships not only in two disciplines, but also in three or more disciplines; fourthly, the fact that the teachers and most of the students studying interdisciplinary topics in natural sciences partially use the possibilities of information technologies in their activities or do not use them at all; fifthly, teachers in the field of information technology who teach in the fields of natural sciences are limited to knowledge related to information technologies, and almost all of their attention is focused on facilitating the transition of interdisciplinary and other complex topics in natural sciences. being; sixth, the absence of mutual cooperation between teachers who teach interdisciplinary subjects in natural sciences and teachers in the field of information technologies; seventh, the lack of database and bank of topics and issues related to interdisciplinarity in natural sciences, etc. [2].

The role of information technologies in improving the quality and efficiency of teaching topics related to interdisciplinarity in natural sciences is incomparable. The use of information technologies allows students to deeply analyze complex issues in the cross-section of two, three or more disciplines, to understand the essence of phenomena and processes, to develop research activities, to increase their interest in interdisciplinary research, to develop new research or trends and the emergence of innovative ideas and the formation of skills and abilities to carry out future research activities.

The use of information technologies in the teaching of interdisciplinary topics has its own characteristics. They consist of the following: firstly, the model-algorithm-program trinity is based on the application of information technologies, to acquire the opportunity to research phenomena and processes reflecting the interdependence of these triads by conducting a computational experiment, and secondly, precisely the nature of the phenomenon and process to work not with him, but with his model, and thirdly, to obtain scientifically important information about the nature of phenomena and processes in the form of numbers or tables of

numbers; fourth, to visualize the obtained numerical results in a graphic form; fifth, to carry out calculations in the values corresponding to a large-scale change of the parameters characterizing events and processes; sixthly, it leads to the formation of professional competences of students to study interdisciplinarity in natural sciences on the basis of information technologies [3].

The main focus is on the conclusions of the researchers who conducted scientific research on the problem in order to determine how important the problem of interdisciplinarity is for the student and how it affects the student's thinking. Academician A.A.Samarsky writes that there is no possibility to study the technical, ecological, economic and other systems studied by modern science with the help of usual theoretical methods. Therefore, mathematical or in a broad sense, informational modeling is an integral part of modern scientific and technical development.

Setting the issue of mathematical modeling of an event or process requires the creation of a clear action plan. It can be conventionally divided into three stages: model-algorithm-program. On September 23, 2020, the new version of the Law "On Education" was adopted in our country. Based on the successful implementation of the tasks defined in it, an educational infrastructure covering all stages of the educational process, fully meeting the requirements of modern innovation, i.e. an integrated system of continuous education, was created. This system serves the fundamental reform of the education sector, the comprehensive development of education as a single training-qualification production complex.

The analysis of literature and research shows that the issue of teaching informatics and information technologies to students with the help of integration in the conditions of digital technologies in our country has not been fully resolved [4]. The educational process, at each stage, was required to instill this updated essence, innovative content into the thinking of young people and make them competitive in the society. At the new stage, such tasks as bringing together all the tasks related to the formation of a well-rounded person, developing the theoretical and practical aspects of this goal, and defining the implementation mechanisms for the higher education system have become relevant.

In the conditions of digital technologies, the effective organization of training with the help of integration creates a great opportunity to meet the important life achievements of students, to scientifically substantiate their points of view, and gives effective results in the teaching of informatics.

In the context of digital technologies, students can use the following software tools with the help of integration: Moodle, Wordpress, PHP, Turbo Site, Bandicam, Audisity, Movavi Video, Editor Plus, AutoPlay, Media Studio 8, Macromedia Flash.

In teaching informatics and information technologies to students with the help of integration:

1. To develop the competencies of professors-teachers to create an idea about information technologies, advanced foreign experiences in this field and to use them in practice;
2. Students will be given the opportunity to activate their knowledge, develop their creative abilities and improve their professional competence in the future;

3. With the help of integration, it is possible to effectively organize studies, to organize and implement online and offline seminar-trainings, special training courses based on information technologies during the teaching process;

4. Development of students' competences aimed at the future specialty, increasing information and communication literacy, using games as a didactic game for educational and educational purposes and developing suggestions on this basis;

5. With the help of digital technology integration, it serves to develop recommendations based on the development of creative abilities, measurement of their level and monitoring, as a basis for developing a set of tasks that guide students to future work activities.

Thus, as a result of our research, a number of literature and scientific sources were analyzed. From the analysis, it can be seen that the issue of teaching informatics and information technologies to students with the help of integration has not been fully resolved. In the conditions of digital technologies, especially in our country today, the establishment of digital HEIs is one of the issues being studied as feedback in the era of globalization. It is possible to achieve high results in teaching by using integration for students.

The analysis revealed that the modeling of didactic processes based on integration is a socio-pedagogical necessity.

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