

Aspects Of Integrated Education In Teaching Physics

Atoyeva Mekhriniso Farkhodovna,
Associate professor of Bukhara State University, Ph.D.

Annotation. At the same time, many methods of using information and communication technologies in physics lessons and the effectiveness of these methods are analyzed. Ensuring the acquisition of skills in the study of science, the formation of hypotheses, design, conducting experiments, evaluating the results obtained, developing skills for the safe and effective use of laboratory equipment, accurate measurements and the adequacy of the assessment of the level of results obtained, based on an interdisciplinary analysis of educational tasks, in order to provide scientifically based evidence of their action.

Keywords: physics, interdisciplinary integration, teaching, research, information and communication, effective teaching aids, effective teaching methods.

The basis of educational activity is needs, motives, goals and interest, which is a set of factors described by the word "motivation". Motivation acts as an internal driving force of personal development, because on the basis of its high-level formation, it is possible to effectively develop education and activate educational activities. First of all, the interaction of internal and external sources of educational motivation helps to form subject, meta-subject and personal results of students.

Naturally, teachers have repeatedly considered the role of motivation in the educational process in their works. For example, L. I. Bozhovich and L. S. Vygotsky studied a psychological approach to the problem of motivation; P. M. Yakobson studied the problems of activity motivation in the context of personality formation; P. Ya. Galperin and others in their works looked for the connection between educational motivation and other components of teaching. Increasing the educational motivation of students directly depends on the use of effective forms of knowledge activity, the development of systematic and logical thinking, a new approach to reflect the content of the subject through integrated lessons and interdisciplinary integration is used.

A special group consists of technical training tools. This group includes new information technology tools - computers and computer networks, interactive video; media-educational tools, educational equipment based on electronic technologies, etc.

Two large groups of educational tools can be distinguished: a source of information and a tool for mastering educational material, so it can be said that educational tools are all information and resources that serve as a source of information. are objects and processes. mastering the content of educational material, developing and educating students.

All training manuals are divided into material and ideal. Material tools include textbooks, study guides, didactic materials, primers, test materials, models, visual aids, technical training manuals, and laboratory equipment.

General sign systems such as language (oral speech), writing (written speech), systems of conventions in various disciplines (musical notation, mathematical apparatus, etc.), cultural achievements or works of art (painting, music, literature) . , visual aids (diagrams, pictures, drawings, diagrams, photographs, etc.), educational computer programs that make up the coordinating activity of the teacher, the level of his competence and internal culture, methods and forms of organizing educational activities, the whole the system of training in this educational institution, the system of general school requirements.

It should be noted that training is effective when material and ideal learning tools are used together, complementing and supporting each other.

The educational content is formed in three stages. The first and closest level to the teacher is the lesson. Based on the recommended topic and the amount of material, the teacher himself builds the lesson. It tries to describe as fully as possible the educational content included in the subject of this lesson and the volume is more or less equal to the material presented in the textbook and the recommended set of exercises.

The second level is an academic subject. The content of the subject is usually formed on the basis of the amount of hours allocated to the subject and the social importance of sections and blocks of educational materials selected as educational material.

The third level is the entire educational process (for all years of study at a general educational institution), covering all content, i.e. academic subjects, their number and the amount of hours allocated for each of them. We call primary teaching aids the tools that a teacher can use to organize and deliver a lesson. Second-level teaching tools include tools that allow you to organize and conduct on-demand teaching of any subject. Even the means of organizing the study of a particular subject are not enough. A whole system of tools is needed to determine the topics under study, their interrelationships and interrelationships. So we have a three-step system of tutorials.

Ideal learning tools	Material training manuals
Class level	
<ul style="list-style-type: none"> - linguistic systems of signs used in oral and written speech; - artistic works and other cultural achievements (painting, music, literature); - visualization tools (diagrams, pictures, drawings, diagrams, photos, etc.); - educational computer programs on the subject of the lesson; - organizational and coordinating activities of the teacher; - teacher's qualification level and internal culture; - forms of educational organization -types of activities in the lesson 	<ul style="list-style-type: none"> - separate texts from textbooks, manuals and books; - textbooks, problem books, special assignments, exercises, assignments from didactic materials; - test material; - visualization tools (objects, working models, models); - technical training manuals; - laboratory equipment.

Each element of the system is a complex and independent subsystem of its own.

Learning tools.

- Language sign system: the teacher's speech (presentation) is the leading source of information for students. The role of the teacher's speech as a source of information is reduced in the direction from academic topics that have a leading component of "scientific knowledge" to educational topics that form an aesthetic attitude to reality. An artistic work, especially a musical work or a painting, cannot be exhausted by the teacher's presentation. The predominance of educational information in different subjects varies.

- Cultural achievements (painting, music, literature): They play a key role in the teaching of humanities. Thus, the subject of "literature" is based on the study of fully created works, during which the plots, motives and actions of the characters are understood and compared, and the peculiarities of the language are analyzed. Music and painting, as in literature, are based on examples already created by mankind. In these subjects, works of art act as the main study guide.

- Visual aids: as an element of the system of teaching aids, they help to fully reveal and master the content of the educational material, but sometimes they also work as an independent source of information. The main task of visual aids is to help in the complete and deeper understanding of the image of an object or event. These functions are implemented to varying degrees in all types of educational subjects. Visual aids used in the educational process are divided into two types. Images of objects and events. This includes diagrams, pictures, drawings, diagrams, photographs, etc. In an experimental test of the effectiveness of memorizing the text, 15% of the information was absorbed by the auditory sense, 25% by the visual perception, in the complex, i.e. with simultaneous vision and hearing - 65%.

- Educational computer programs on the subject of the lesson: computer technology has great potential as a teaching tool. Any lesson topic can be presented in an interesting way. Monotonous and boring exercises can be presented in an interesting way.

But today there are the following obstacles to the widespread introduction of computers into the educational process:

- lack of educational programs;
- high cost of equipment;
- the negative impact of computers on people, especially on children's bodies. Today, the issue of complete computerization of the educational process is not for the above reasons, but the use of computer programs in some subjects and subjects continues and is actively expanding.

- Selected texts on the topic of the lesson: The second important teaching tool (after the teacher's speech) is the text, which is the educational material.

- Tasks, exercises, tasks: play a role in learning, like texts. The difference is that texts are used for students to acquire new knowledge, and tasks and exercises are used to consolidate the acquired knowledge and develop skills.

- Test material: test results are used not only for monitoring during the educational process, but also for correcting identified deficiencies, i.e. for training and development. Such developments are called test didactic materials.

It can be concluded that in the educational process there is a need to combine the elements of the system of educational tools with each other. The greatest effectiveness in teaching is provided by the use of a system of well-chosen teaching aids. Therefore, combinations and interactions should be considered.

Unfortunately, among the study guides, apart from the textbook, there is no stable book specially designed to review the entire course. Students repeat the material in the sequence that corresponds to the initial acquaintance with it or use different guides.

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