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## INTEGRATING OF INFORMATION TECHNOLOGY INTO TEACHER TRAINING: A METHODOLOGICAL APPROACH

*Abstract*

This article discusses the place, importance and scope of information technology in the education system, gives characteristics in the field of information technology, indicates directions for the methodological goals and objectives of chemistry teachers. The place and significance, directions and goals of modern information technologies in educational activities are set out without fail. In this direction, technologies are classified as information and software, and each of them has its own functions and features. General pedagogical processes are considered, including ways of effective use of information technologies and programs in the process of teaching students in chemistry.

The transfer and assimilation of knowledge as the most important components and one of the main goals of the learning process is manifested as a set of targeted measures and actions, aspirations aimed at forming and improving the knowledge and competencies of students, thereby educating and training individuals and citizens. By improving the quality of education, raising the degree, society as a whole gets the opportunity to develop, progress socially, economically, technologically, and increase competitiveness among the world community. From the point of view of pedagogical research and the results achieved, it can be seen that the meaning of the subject of chemistry today acquires a different meaning in the era of production and technological modernization. It is no secret that the value and importance of information technology is growing every year. Among the main goals facing chemistry teachers is the ability to clearly and reliably convey to students the meaning and properties of the most interesting and complex subject that studies the properties, changes of substances and is aimed at recognizing the causes that prompt these changes, using the achievements of information technology.

**Keywords**: information technology, integration, methodological approach, chemistry teacher, teaching chemistry.

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## АҚПАРАТТЫҚ ТЕХНОЛОГИЯЛАРДЫ МҰҒАЛІМДЕРДІ ДАЯРЛАУҒА ИНТЕГРАЦИЯЛАУ: ӘДІСТЕМЕЛІК ТӘСІЛ

*Аңдатпа*

Бұл мақалада білім беру жүйесіндегі ақпараттық технологиялардың орны, маңызы мен қолданылу аясы қарастырылған, ақпараттық технологиялар турасында сипаттамалар берілген, химия пәні мұғалімдерінің әдістемелік мақсаттары мен міндеттері жөнінде бағыттар көрсетілген. Бүгінгі таңдағы ақпараттық технологиялардың білім беру ісіндегі орны мен маңызы, бағыты мен мақсаттары, міндетті жинақталып баяндалған. Бұл бағыттағы технологиялар ақпараттық және бағдарламалық болып жіктелетіні және олардың әрбірінің өзіндік қызметтері мен ерекшелектері айқындалған. Жалпы педагогикалық үдерістер, оның ішінде химия пәні бойынша білім алушыларға білім беру барысында ақпараттық технологиялар мен бағдарламаларды тиімді пайдалану тәсілдері қарастырылған.

Білімді жеткізу және меңгерту оқыту барысының маңызды құрамдас бөліктері және негізгі мақсаттарының бірі ретінде білім алушылардың танымдары мен құзыреттіліктері қалыптасуына және артуына, сол арқылы қоғамға пайдалы тұлғалар мен азаматтарды тәрбиелеп оқытуға бағытталған бағдарлы шаралар мен әрекеттердің, ұмтылыстардың жиынтығы ретінде көрініс береді. Білім сапасын биіктету, дәрежесін көтеру арқылы жалпы қоғам әлеуметтік және экономикалық, технологиялық тұрғыда дамуға, ілгерілеуге, әлемдік қауымдастық арасында бәсекелестік қабілетін өсіруге мүмкіндік алады. Педагогикалық ізденістер мен қол жеткізілген нәтижелер тұрғысынан қарағанда химия пәнінің маңызы бүгінгі таңдағы өндірістік және технологиялық жаңғыру дәуірінде өзгеше мән мен мағынаға ие болып келе жатқанын байқауға болады. Бұл ретте ақпараттық технологиялардың қадірі мен маңызы жыл өткен сайын артып келе жатқаны жасырын емес. Химия пәні мұғалімдерінің алдында тұрған сәулелі мақсаттардың қатарында білім алушыларға заттардың қасиеттерін, өзгерістерін зерттейтін және сол өзгерістерді туындатуға қозғау болатын себептерді тануға бағытталатын қызғылықты да күрделі пәннің маңызы мен қасиеттерін ақпараттық технологиялардың жетістіктерін пайдалан отырып түсінікті әрі сенімді түрде жеткізе білу.

**Түйін сөздер:** ақпараттық технология, интеграция, әдістемелік тәсіл, химия мұғалімі, химияны оқыту.

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## ИНТЕГРАЦИЯ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В ПОДГОТОВКУ УЧИТЕЛЕЙ: МЕТОДИЧЕСКИЙ ПОДХОД

*Аннотация*

В данной статье рассмотрены место, значение и сфера применения информационных технологий в системе образования, даны характеристики в области информационных технологий, указаны направления по методическим целям и задачам учителей химии. Место и значение, направления и цели современных информационных технологий в образовательной деятельности, изложены в обязательном порядке. В данном направлении технологии классифицируются как информационные и программные, и у каждого из них определены свои функции и особенности. Рассмотрены общепедагогические процессы, в том числе способы эффективного использования информационных технологий и программ в процессе обучения обучающихся по химии.

Передача и усвоение знаний как важнейшие составляющие и одна из основных целей процесса обучения проявляется как совокупность целенаправленных мер и действий, стремлений, направленных на формирование и повышение знаний и компетенций обучающихся, тем самым на воспитание и обучение личностей и граждан. Повышая качество образования, повышая степень, общество в целом получает возможность развиваться, прогрессировать в социальном и экономическом, технологическом плане, наращивать конкурентоспособность среди мирового сообщества. С точки зрения педагогических изысканий и достигнутых результатов можно заметить, что значение предмета химии приобретает сегодня иной смысл в эпоху производственно-технологической модернизации. При этом не секрет, что ценность и значение информационных технологий с каждым годом растет. Среди основных целей, стоящих перед учителями химии, - умение ясно и достоверно донести до обучающихся значение и свойства интереснейшего и сложного предмета, изучающего свойства, изменения веществ и направленного на признание причин, побуждающих к возникновению этих изменений, с использованием достижений информационных технологий.

**Ключевые слова:** информационные технологии, интеграция, методический подход, учитель химии, преподавание химии.

**Basic Provisions.** The manuscript emphasizes the critical role of information technology (IT) in modern education, particularly in chemistry teaching. It outlines the importance, scope, and characteristics of IT in education, discussing how it is essential for methodological goals and objectives in teacher training. The

article categorizes technologies into information and software, each with distinct functions and features. It highlights the use of IT in enhancing pedagogical processes and effectively teaching chemistry, focusing on knowledge transfer and assimilation as key components of the learning process. The integration of IT in education is seen as pivotal for improving education quality, thereby contributing to societal progress in various sectors. The manuscript also notes the evolving significance of chemistry in the context of production and technological advancements, underscoring the growing importance of IT. It stresses the need for chemistry teachers to adeptly convey complex subject matter to students, leveraging IT advancements. This integration aims at not only educating but also shaping individuals and citizens, enhancing global competitiveness and societal development.

**Introduction.** It is known that modern educational processes are filled with a variety of didactic-methodological, organizational searches, achievements, directions, as well as entering the path of development, as well as the possibility of practical application of various technological achievements, including information technologies. It is obvious that the increase in the number of means, methods, routes for storing, processing and transmitting information has created conditions for teachers to breathe, spread their wings, fully demonstrate their abilities and abilities. In addition, it provided students with high-quality and diverse, interesting content-content, which allowed them to significantly increase the level of learning, change the direction, and provide more information within the same time frame. It can be said that the obstacles and difficulties faced by the teaching community in improving the quality of education through the use of sound and figurative visual aids, interactive whiteboards, the wide possibilities of personal computer structures, in-depth and interesting interpretation of subject content have been reduced to a large extent, or even almost completely solved. Today, the benefits of Information Media in the field of education are clearly visible, clearly visible and recognized. Information technologies serve at the level of mutual understanding and active participation between teachers and students in teaching, mastering, and teaching subject content.

It is obvious that in the process of pedagogical science today, one of the most relevant and demanding areas in the education system as a whole, it is necessary to use information technology achievements in the teaching and educational process, to use informatization opportunities. It is aimed at increasing the cognitive capabilities of students, increasing their intellectual potential, expanding the horizons of their intelligence, thereby increasing the global level of educational processes. In the law "About education" it is noted that one of the main tasks of the education system is the introduction and effective use of new teaching technologies, including credit, distance learning, information technologies, which contribute to the rapid adaptation to the changing needs of society and the labor market, formation of a network of education and science with high competitive potential, Keeping Up with the global information flow as the main mechanism for the development and development of the system, thereby acquiring the necessary information and information, knowledge and concepts, skills and abilities [1].

Today's teachers are considered in terms of the need to be able to recognize and participate in the emerging trends in the field of pedagogy, adapt to the existing phenomena in pedagogical science, work with new systems of thinking, cooperate with students, become a qualified, professional specialist in their field. At the same time, it is expected that in the new era, knowledge of the basics of information and communication technologies, which have become widespread and rapid, have spread to the field of education, to be able to apply them in practice, to increase the effectiveness and optimality of training, to become a versatile, versatile specialist with knowledge and skills, professionalism and skill in carrying out work aimed at developing a set of personal competencies of students.

The use of information and communication technologies in the process of teaching chemistry is of great importance, efficiency. It is clear that in the process of introducing students to the complex and interesting subject of chemistry, the teacher's most reliable companion, constant assistant, universal servant, looked at and appreciated views were not the only ones. Through modern information technologies, the teacher has the opportunity to increase the efficiency of his activities, increase his popularity, increase his usefulness. It should be noted that any of these indicators contribute to the progress of learning, increase the motivation of students to follow the example of the teacher and learn.

**Materials and methods.** One of the branches of pedagogical science is teaching and teaching chemistry. Certain methods and techniques, visual and laboratory equipment, information technologies are used to introduce students to the basics of chemistry, master them at the educational and skill level, taking into account the peculiarities and differences of the subject of chemistry. In the list of specialties, courses on

teaching methods in chemistry are included in the curricula of higher educational institutions, the price of which is set for the development of subject teachers of chemistry.

The methodology of teaching chemistry as an academic discipline and pedagogical science is considered separately.

"The subject of study of chemistry is the transformation of matter, the transformation of its structure and composition under the influence of various compounds and reactions" [2]. it is known that the method of chemistry as a teaching method is one of the channels of pedagogical science that studies the ways and ways to manifest, express, master, accustom, explain to students such a set of basic laws and laws.

Under Information technological means is understood the means and mechanisms necessary for the perception, processing, production, modification, distribution, application of any information. When considering this in connection with the education system, the organization and implementation of cognitive and educational processes includes tools and equipment that allow you to convey information, information, data to the teacher and student, increase the potential of the educational, educational process, expand the scope, deepen and diversify the level of knowledge. Technologies and means of processing and supplying information, which are often used and widely used in the organization of the educational process and the implementation of the educational process, can be conditionally divided into information and software.

Means of information processing and delivery include a personal computer device, an interactive whiteboard, a printing device (printer), a projector device, includes a tele-communication device, a keyboard and mouse device, a sound transmission device, a video display device, and a network device. In addition, it is possible to diversify and deepen the educational process through additional devices, such as tablets, smart phones (smartphones), educational platforms and applications. Each of these devices is widely used in the implementation of the pedagogical and teaching process. Software tools include the internet, virtual compilers (constructors), interns, various computer programs, e-books, textbooks, and Information Systems.

"The measure of Information Technology provision of education in the system of Pedagogical Sciences is aimed at qualitative development of the educational process, Deep development and rapid improvement of educational and educational processes through rational and reasonable large-scale use of information and communication technologies in the entire network of National Education with the use of modern technological achievements in the state orientation, achieving the level of education of leading countries in the world in the near future" [3]. As a result of the effective introduction of information and communication technologies into the educational process, students have a great opportunity to develop diversity, increase their interest and motivation in Learning, Mastering the discipline. In addition, it has a positive impact on the development of inquisitive abilities of young people, the formation of creative thinking skills, and the development of cognitive skills. "From the point of view of pedagogy and psychology, the use of information technologies in education is of great benefit" [4].

**Results and discussion.** In the works of fundamental scientists, the progress of the introduction of information technologies in the educational process is scientifically substantiated and the conclusions of the corresponding philosophical and sociological models are made (Figure 1). The content and essence of informatization, the general principles of the structural system, as well as the orientation and directions of the educational process through a computer device, the features of the theoretical and actual applicability of such measures have been studied in detail by research scientists. "Emphasis is placed on information technologies, the use of computers in the educational process, the contact nature of Information Technology, various degrees of analysis are carried out, definitions are established" [5]. Although each of them seems to be characteristics that need to be supplemented and discussed separately, when summarized, they are valid conclusions about the importance of Information Technology in the knowledge system.

From the conclusions made by scientists, we can see that the main means of information processing and transmission technology are a personal computer device and software products. We see that the widespread use of these technologies in teaching through the method of systematization increases students ' ability to master the technique and makes cognitive activities more complete.

The ability of information technologies to transform forms of education is enormous. It is obvious that the possibilities of this technology in the implementation of Distance Education, individual or group forms of education are becoming more and more obvious and recognized. The sound - visual capabilities of information technologies contribute to the improvement of the quality of education in general, as well as to the strengthening of the student's desire to learn, to clarify the concepts and concepts related to the subject. This, in turn, will increase the competitiveness of the national education system.

*Figure 1-definitions of scientists on Information Technology*

The main requirement today is the use of information-based technologies in the organization of training. It is obvious that this demand will change direction in the future. In connection with the birth of new opportunities, technology advances, among which the ability of information technologies increases many times over, the ability to timely master such qualitative changes, take appropriate measures, make rational and effective use of technological achievements in the education system, in the educational and training process, remains a priority that should remain the focus of the institutions and organizations of the organization and management of Education.

Formation of the course of education, management of students 'cognitive abilities, identification and development of students' intelligence and attention opportunities in mastering the academic discipline, awakening the desire for creativity, orientation of the emerging worldviews in the direction of the corresponding approach to science are honorable tasks facing the teacher.

How the course of training takes place is determined in accordance with the actions of students. "Originality arises when it comes to the methods and techniques, methodological foundations of teaching chemistry" [6]. In the process of teaching the discipline, it is better to focus on the ability to be attentive and intelligent, understanding, along with the creative aspirations of students. It is especially important to carry out work with the help of visual aids, equipment, interactive whiteboards for the comprehensible passage of the discipline. After all, the main task of a chemistry teacher is to explain to students the essence and significance of this branch of science, chemistry, to show the place of Chemical Science in society, thereby creating conditions for students to recognize the subject, master it, actively participate and participate in the process of recognizing chemistry in various ways [7]. Such tasks and goals are covered by the method and methodology of teaching chemical science as a discipline. The teacher teaches students to master teaching materials, concepts and concepts about chemistry, learn be able to implement them in the framework of practice, identify the characteristics of students ' skills and abilities.

The methodology, together with an assessment of the principles and laws of the ability to transmit knowledge, provides a holistic view of the purpose and content of education, tools and forms of training, interaction between the student and the teacher. "The object of consideration of methodological approaches to teaching chemical science is directions, methods and actions in teaching chemistry" [8].

The process of teaching, in contrast to the orientation of pedagogy, is the ability to absorb public experience into the student's mind. In the didactic context, the content of learning is a combined process in which the actions of the teacher's personality (conducting the lesson) and the actions of students (cognitive improvement) are combined. This is a methodological basis that combines the actions of the teacher in passing the subject, which continues the process, and the actions of students in the course of learning.

"In teaching chemistry, the methodology provides for the manifestation of hypothetical results, in the implementation of which it relies on the laws of learning" [9]. Such a course of knowledge, built on the principles of didactics, is the scientific basis of chemistry. This basis is formed from three areas: chemical production, general properties of substances, laws and theoretical knowledge in chemistry.

"Computer technologies of teaching – a set of methods, methods, tools for creating pedagogical conditions of work on the basis of computer equipment, telecommunication means of communication and an

interactive software product that simulates some functions of a teacher, such as the display, transfer and accumulation of information, control and management of cognitive activity of a student" [10].

Using information technologies, including a personal computer device, it is possible to transform the course of the lesson, create a model orientation of education focused on the individuality of students. Using the possibilities of communication and communication, the internet network, teachers can create and develop universal forms of learning, organize students ' own search, open the way for the development of creative aspects, and are of practical importance as a link to methodological tools.

It is known that today the process of modernization of education, improvement in accordance with innovations in the course of training and scientific and technological achievements taking place at the world level is being carried out persistently and intensively. Teachers are constantly looking for new approaches, ways and methods related to teaching. Over the next decade, information technologies, including the internet, mobile communications, and digital technologies, have become widely used in the educational direction. It is obvious that the transition to the use of technological innovations has been positively received by students, the desire for new achievements has been awakened, they have the opportunity to reveal their abilities and attitudes as much as possible. The use of information technologies in education is of great importance for students to find satisfaction with their acute interests, constant cognitive aspirations, identify and develop their personal characteristics, their own independence. During the course of training, students learn from the teacher to use information technologies for cognitive and educational purposes, develop the necessary skills for mastering modern achievements and have the opportunity to prepare for joining the course of continuous learning, continuing improvement of knowledge and competencies, which is becoming a priority requirement of today [11].

Information technologies are very useful in improving the cognitive competencies of students. In the course of teaching chemistry, students get acquainted with many new information and concepts. In addition to memorizing and memorizing all of them, it is necessary to understand the relationship, continuity, similarities and features of the presented new information, their contents and concepts. At this point the possibilities of information and communication technologies help the teacher in the course of training, are suitable for students to thoroughly and comprehensively understand the content of the subject, to consolidate what they have learned. Development of models of chemical reactions using a personal computer, its visual demonstration, the use of various educational animated videos about chemical elements contribute to the visual, understandable and easy-to-remember content of the lesson. With the help of information technologies, it will be possible to organize a virtual trip to the world of chemistry, expand the horizons of students ' knowledge, show full-fledged information about chemical processes, industries. The use of information technologies should be appropriate, purposeful, in accordance with the well-thought-out methodology. In other ways, you can resort to the help of information technologies when it is difficult to disclose the content of the subject or students have difficulty mastering the course of training (Figure 2).

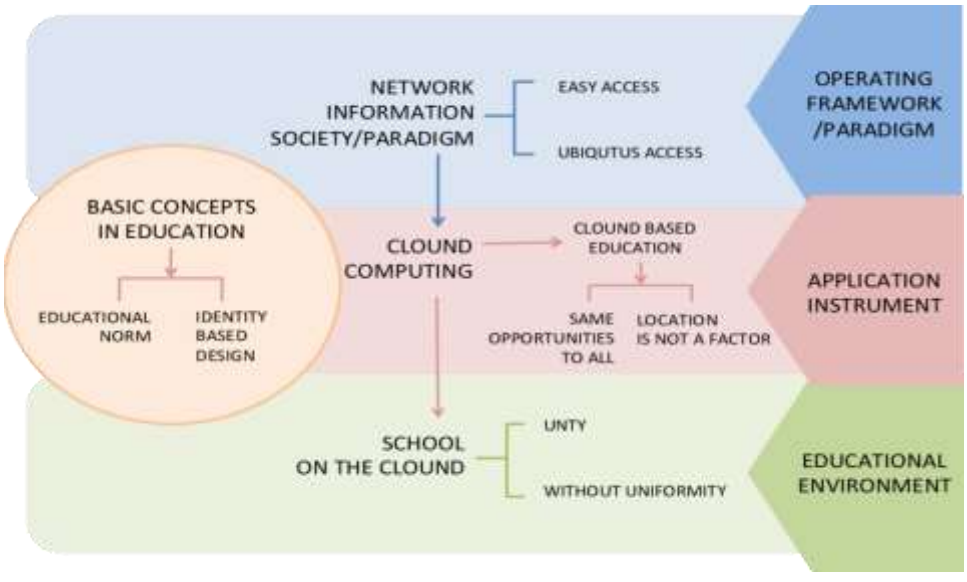


*Figure 2-basic concepts in the education system [12]*

Information technology, depending on the field of education, becomes one of the tools of the mentioned pedagogical technologies, forms a set of equipment that works with information resources (video, sound, images, animation, text, etc.) using special techniques, software and technical equipment for the purpose of processing and transmitting information in the organization and implementation of education, training. Computer technology will become an auxiliary tool in the course of training. In most cases, a personal computer device is able to replace most of the visual aids and necessary models that are large in size, inconvenient to carry and use during classes. Similarly, with the help of a personal computer device, you can replace and compensate for the lack of distributed visualization. The delivery of information is not considered the delivery of complete knowledge. It is obvious that the main direction of the development of a modern society is mass Information Science. It is clear that as the connection of almost all human life activities with informatization Technologies is tightened, the educational sphere cannot stay away from this process. In this direction, the scientific community is engaged in such issues as the search for options for the main content of knowledge, the study of the possibilities of modern didactics, increasing the efficiency and potential of learning structures [13].

The formation, improvement and development of cognitive competencies of students, identification of personal characteristics, awakening and orientation of creative abilities remain the main directions of pedagogical science. To achieve these goals, it is important that training courses are organized, methodological and didactic research is carried out, comprehensive infrastructure is installed, tools and equipment are provided, achievements of Science and technology are taken into service, and appropriate measures are taken and not stopped.

According to traditional pedagogical principles, the course of education is centered around the personality of the teacher, according to modern guidelines, the priority direction is given to the independence of students, and the teacher is considered as an active auxiliary, driving force on the path of development and formation of the student [14]. The ability to effectively implement the potential of information and communication technologies to the required extent depends on the inclinations and qualifications of the teacher. Interactive visualization technology, tools and programs for converting text into sound format, computer modeling programs create conditions for students to multimodally present information, understand the use of the academic language in a certain context, visualize the progress of complex tasks, make the learning process interesting, active, complete, contribute to the effectiveness of the teacher's teaching activities, increase the cognitive and memory competencies of students. The state, the educational institution, and society will have a lot of advantages if information technologies, which are heavily allocated and equipped with Treasury funds, are not understood, mastered, ignored by teachers, and are not used for the benefit of students. It is obvious that a teacher who is able to master new technologies will give and teach students a lot. "Learning and teaching is done only through communication based on mutually active actions, only through interaction can one learn and teach" [15].

Informatization of the learning process means optimizing the learning process through a computer and computer equipment. The meaning of what this relates to pedagogy is due to the fact that pedagogical problems are solved by this. The list of these issues, optimization criteria, input data and expected results are determined depending on the course of training. Since the teacher's attempt to disclose the content of the subject to students belongs to the category of information delivery, the course of training shows that from the very beginning the basis of Information Technology was in use. In other words, any pedagogical technology is informational. Due to the widespread use of personal computers, this concept has become more technical and began to be called "innovative information technology for teaching" [16].

In interactive learning, group interrelated approaches are optimally implemented. Students quickly enter the course of interactive learning, the exchange of concepts, knowledge, knowledge, opinions accelerates, and work together to complete a common task together as a team. In connection with the subject of Chemistry, students understanding of the causal relationship of properties, structure, composition of substances is accelerated, recognition of terms belonging to chemistry increases, memorization of chemical elements and symbols assigned to them increases, the ability to formulate formulas of compounds and chemical reactions increases, understanding at what level the relationship between everyday life and chemistry is, understanding the relationship and integration of society and technological processes.

The advantages of teaching through interactive methods and approaches are clearly visible in comparison with traditional teaching. As a result of the introduction of new technologies in the course of

training, the quality of education increases due to the fact that students are actively involved in the course of training; in mastering the new content of the discipline, students become more inspired to participate in the course of training, because they act as active participants, and not as an independent listener; the course of training becomes more adaptive and convenient. "The basis of interactive learning is the ability to establish a dialogue with someone (a person) or something (a computer)" [17].

When the basis of knowledge is considered information, the human thing is able to store, process and distribute information. Hence the processes that occur with information. The concept of Information Culture means that students can purposefully engage in information, learn how to find, differentiate, create, and distribute information, and use information technologies in this direction [18].

The importance of understanding interdisciplinarity for students is great, the scattering of Subject Content negatively affects the course of learning, creates difficulties for students. From the point of view of personal development, students use various points of competence in training, such as cognitive, social, and practical, which lead to good results. The practical meaning of training includes such components as interaction, activity, practical application of knowledge. The formation of an information culture of students is a phenomenon that is systematized and developed in the course of training.

Personal computer devices and their equipment have already come into widespread use in education. The computer can be used at all stages of the training year. Computer equipment has a lot of help in explaining the lesson, revealing a new topic, fixing the content covered, repeating tasks, at the control and evaluation stages. From the point of view of students, a computer device serves as a substitute for the activities of a teacher, a working tool, an object of research, a grouping of common interests, an opportunity to effectively use their free time.

For a learner, a personal computer can replace the function of a teacher or a book is understood as the ability to convey data and information related to learning. Also, a personal computer, due to its multimedia and telecommunications capabilities, can replace the function of a visual aid, become a platform for obtaining personal information, replace the function of a control and Evaluation Center, which is used for students to observe and evaluate their level, and serve as a simulator for preparing for classes. As a working tool, a personal computer device serves as a place for preparing and storing texts, an editorial Center for processing and complementing texts, a center for preparing graphic tables, a computing center that quickly and accurately reproduces the results of the examination, a modeling tool [19].

When considered as an object of research, one understands the programming of a personal computer device, the ability of a computer to obey established processes, the creation of software products, and the use of various information environments. The grouping ability of a personal computer device is achieved through the internet, when a large number of students are simultaneously grouped around one task and deal with the solution of a problem. It can be said that a personal computer device has already become the most basic assistant for a teacher. With the help of the device, the teacher can speed up and simplify the organization of the learning process, increase the ease of monitoring the course of the subject by scheduling, developing diagnostic measures, simplify the assessment process, monitor the progress of coordination work in the classroom, and create conditions for students. With the help of a personal computer, it is convenient to prepare individual training programs for straight, visual and audio classes. Forms and uses an information environment related to the presentation of the content of the discipline, thereby increasing the cognitive competencies of students, developing their activity in the classroom, and developing memory.

The work on activating the cognitive abilities of students is one of the most important theoretical and practical problems of modern pedagogy. The development of activity, self-interest, initiative, creativity of students is the main requirement of today's life, which is assigned to the course of training and education. In this task, teachers, psychologists, methodologists and teachers are jointly looking for new ways and new proposals [20].

Effective in stimulating the creative motivation of students is the conduct of training in the form of a game, in the form of research, in the form of Group teaching methods. In the course of such training, along with the use of cognitive competencies, students participate in the course of training with increased emotional influence. Through this, such basic didactic principles as the principle of equality of levels of cognitive activity of students, the principle of trust, the principle of feedback, the principle of acquiring a research position are implemented [21].

Speaking about the methodology of using information and communication technologies in chemistry, there is no doubt that one of the most optimal, effective, productive and productive ways is the presentation method. Multimedia presentations, being Dynamic, Active, Active with the coverage of both video, sound and image, can retain the attention of students for a long time, and through the simultaneous mobilization of the visual and auditory abilities of students, the data in the presentation finds a good place in the minds of students, is preserved for a long time. As one of the advantages of this method, it allows you to collect, process, prepare and present the necessary information and information in accordance with the tastes of the teacher himself, without resorting to the help of an additional specialist, depending on the requirements of the topic or the content of the subject.

In the course of teaching chemistry, it is most effective for teachers to use the following algorithm methods:

* Organization of training. The topic of the lesson ("chemical elements", "Chemistry and production") from the presentation prepared for students when starting training,

"our daily life and Chemical Science", etc.), several slides with issues and questions under consideration are shown, and students are asked questions about this information for the purpose of general presentation. The course of the lesson continues, taking into account the general knowledge of students, familiar information, which can be seen from the answers at the same time.

* Activation of knowledge. Cognitive and motivational activities of the teacher cause students ' interest in learning and perception of information. The teacher can fully describe the content of the lesson himself with the help of information technologies, or instruct students to search for it as independent work. Visual presentation of information, such as a picture, table, diagram, is considered effective and effective. If an interactive whiteboard is used, the information displayed on it is widely explained, summarized and reported by the teacher. At the same time, the teacher's explanations are supplemented and visualized by images and images on the interactive whiteboard.

* Check whether the information passed has been confirmed. In order to observe how much of the previous topic was covered, how it was fixed in the minds of students, various methods of control are used. Observe how much he remembered what he read in the textbook, how much he remembered what he heard during training, what information he recognized during independent work, what competencies he mastered in practical training.

* Explore a new topic. Visual aids, video and audio materials are of great importance for the most complete understanding of the content provided during the passage of a new topic. The information displayed on the interactive whiteboard complements the teacher's interpretation, diversifies and provides better memorization.

* Approval and systematization of the topic. In order to remember and structure the topic covered, it is effective to repeat the important information in the visual aids. The approach of computer testing allows you to diversify and personalize the task, provides conditions for presenting verification questions at different levels. During the computer testing, it is possible to return to the unedited questions. It is possible to exercise the competence of" work on mistakes". In addition, computer testing increases the interest of students. During computer testing, the student is in a dialogue with a computer device, and not directly with the teacher, and passing test tasks can be organized in an attractive game form. When the student chooses the correct answer, it is made in such a way that wreaths are presented on the computer screen in his honor, fireworks are scattered, which has a positive effect on the emotional and psychological recovery of the student, keeps him away from negative emotions and stressful attitudes during testing.

With the effective use of a personal computer device, it will be possible to optimize the course of the lesson, the course of study, approval, and examination as much as possible. The use of information technologies in educational processes serves to optimize the course of training, increase the cognitive and personal competencies of students, increase the knowledge and qualifications of teachers.

The use of information technologies in training measures allows individualizing the course of training, managing all training structures in a single environment. The integration of computer technologies into the number of didactic tools works for the intellectual, moral, aesthetic development of students, contributes to the reproduction of information cultures [22], (Figure 3).

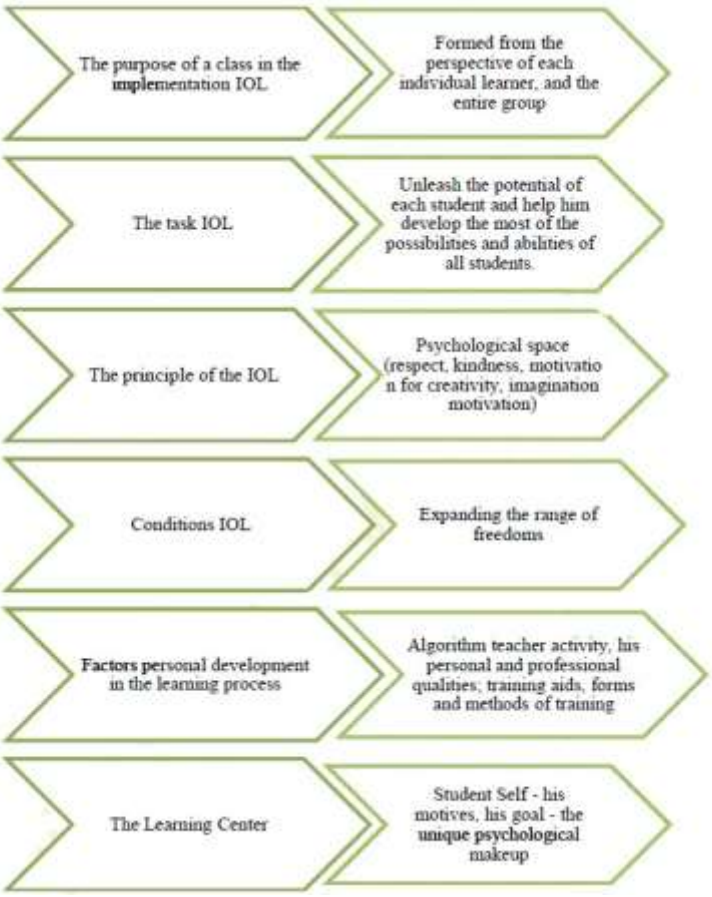


*Figure 3-individual abilities, the relationship between learning and orientation*

It should be borne in mind that in the course of training, students have different levels of cognitive, creative, and giftedness. In this regard, the organization of the course of classes taking into account the individual characteristics of students depends on the foresight of the teacher. Although the given content and task are the same, depending on their individual characteristics, students can perceive it at different levels and offer solutions to different degrees. When using several types of training, the cognitive and emotional needs of students are satisfied, the features of individuality are clearly revealed, and personal qualities begin to increase. Through this, the teaching style of the teacher is also formed.

It is known that traditional teaching methods require a large number of human, administrative, time, and financial resources. Information technologies are able to optimize, accumulate such resources, and provide maximum benefits to the education sector. In addition to improving the productivity of teaching, Information Technology it is aimed at changing the essence and style, transforming from the point of view of modern requirements, making sense in a new way [23].

Through the activities of information technologies, it will be possible to see production facilities online, monitor chemical processes carried out there, get acquainted with the lives of famous chemical scientists with the help of educational sites and e-books, read their works, watch the practical implementation of chemical recitations through video recordings and draw relevant conclusions. There is no doubt that information technologies, when used for their optimal benefit, are achievements that lead to the education, humanization, mutual tolerance and rapprochement of human society, and the education of students in a modern innovative direction. Among the competencies that modern teachers should not neglect are the recognition and presentation of these achievements to the public, the implementation of them in a manner suitable for the use of students and teachers, the timely detection of breakthrough information technologies and the demand for its effective implementation in their discipline.

The search for new methods and methods of Education, ways of best practices that meet the requirements of the time, and sometimes even ahead of time, is a great milestone in the hands of teachers-scientists, including specialists who thoroughly analyze pedagogical and didactic problems related to the

chemical industry. The purpose of pedagogical activity is to improve and optimize educational processes, improve the quality of teaching, and in the process of implementing these goals, it is undoubtedly necessary to integrate and implement modern educational technologies, and for this it is necessary to rely on the successful results of information and communication technologies.

To save time in the process of teaching on information technologies; artistic design of teaching materials; increase the emotional, aesthetic, scientific attractiveness of teaching; optimal perception of the content of the subject by maximizing the ability of students to see and hear, remember; organize a personalized form of learning; focus more on the most important points in the lesson; return to the necessary information and information at any time; open up opportunities for students to use the teaching materials on their own. During the implementation of methodological measures, it is used to summarize the common result of teachers ' work; correct, modernize, develop electronic materials; systematically accumulate and store important information related to the subject and teaching; increase motivation for teaching and learning [24].

**Conclusion.** It is obvious that the educational process, both organizational and methodological, will be revived and updated with the help of Information Technologies. It is necessary to pay attention to these issues and take appropriate measures:

* pay attention to the justification of the principles and methodological approaches to teaching chemistry from the point of view of computerization;

* integration of information and computer technologies into the educational process with maximum convenience;

* transformation of the principles of formation of a healthy personality into a value.

In the 21st century, it is clearly seen that new learning paradigms and manufactured technologies are increasingly influencing almost all societies. The process of development of Information Technologies comes with a channel aimed at combining communication and information technologies. In accordance with this, the course of training also changes the nature of external activity, which is developed independently, and becomes a learning activity formed by modern technologies. The orientation of pedagogical science and specialties is changing from the priority of transmitting information to the priority of creating conditions for teaching. Both the education sector and the teaching community should take into account such changes and phenomena.

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## КАЗАХСТАНСКАЯ МОДЕЛЬ ПЕДАГОГА-НУТРИЦИОНИСТА

*Аннотация*

Сбалансированное питание и формирование культуры питания детей определяет их полноценное развитие и обучение. Приведенные в данной статье результаты научных исследований показали несбалансированность питания детей начальной школы по содержанию основных нутриентов. Необходима системная работа в семье и организации образования формированию культуры питания, основанная на взаимосотрудничестве педагогов, медицинских сотрудников, самих обучающихся и их родителей. С целью улучшения качества питания в организациях среднего образования авторами впервые предлагается модель педагога-нутрициониста и внедрение штатной единицы, функцию которого могут выполнять педагог или социальный работник. Компетенции, необходимые для данной профессии, подходят учителю биологии, обладающему базовыми знаниями по физиологии