NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 11, ISSUE 12, December – 2025

THE USE OF COMPUTER TECHNOLOGIES IN THE ORGANIZATION OF CHEMISTRY LESSONS

[1]Xoliqulova M. I.,
[1]Qodirova A. A.,
[1]Doniyorova S. S.,
[2]Botirova S. A.
[1]Urgut Branch of Samarkand State University named after Sh. Rashidov
[2]Institute of Biochemistry, Samarkand State University named after Sh. Rashidov

Abstract
This article presents information on the advantages of using computer technology in teaching chemistry lessons over traditional chemistry lessons. Students are given feedback on the results of the course on physics and colloidal chemistry using the computer and their analysis.

Keywords: Technology, computer, pedagogical, video, audio, projector, instrument, codoscope, multimedia.

Introduction

The use of modern computer technologies in the educational process is based on certain laws. New pedagogical technologies **have made great strides in the field of education and training "National Program of Personnel Training". This imposes on each teacher the following basic requirements - the ability to teach, educate and objectively assess the knowledge of the learner, as well as develop the skills of supervision.**The teacher of the new century must fulfill the above and possess the qualities of forming a new view of the educational process [1,2].

He must be able to carry out his activities with a deep understanding of the essence of modern, scientific and cultural development, a broad understanding of the system of knowledge about the world and a person, as well as the ability to use computer and other teaching equipment in the educational process, as well as the perfect mastery of national culture and universal values, spiritual development, knowledge of religious sciences, faithful, sense of civic and patriotic duty; The main thing is that the national ideology and the essence of today's economic reforms should be fully understood, as well as the development of various didactic manuals and methodological recommendations for the separate use of tradition and computer technologies. Currently, various types of electronic visualizers are used in the field of chemistry and physical sciences.

The use of modern information technology allows completely replacing old educational equipment - TV, video and audio recorders, dia- and slide projectors, codoscopes and film equipment. It allows for easy elimination of inconveniences in the distribution and maintenance of tables. The data depicted in tables, stored on audio and video cassettes can be easily converted to digital format, as well as stored on computer memory and quickly reproduced if necessary [3].

Computer information technology is a set of methods, forms and tools that affect the process of human development. The technology taught will be identified based on the previous ones and should be consistent with it. He insists on taking advantage of the capabilities of computer technology.

We will consider ways to organize education that will improve the quality of learning using computers.

In practice, 4 basic methods of education organization can be used:

Explanation – exhibition; reproductive; problematic; research-oriented.

Since the first method is feedback between the student and the education system, this method is not suitable for teaching using computer technology. However, it is possible to organize the use of multimedia presentations.

Reproductive methods of education increase knowledge by means of computational techniques, ensure the student's communication with the teacher or computer, and allow organizing the study of the material and its application in similar situations. This method cannot provide a drastic change in the educational process .

The problem-based teaching method allows solving several problems by using personal computers to organize the educational process. The main goal is to activate the activity of perception in learning as much as possible. In order to solve a problem posed in the educational process, it is necessary to solve various tasks on the basis of the acquired knowledge, as well as conduct a complementary knowledge analysis.

Application of the research-based educational method with computers allows independent creative activity in the process of conducting scientific and technical research within the framework of a specific topic [5]. It uses visual aids, practical assignments, graphic and written works, natural objects and their real and symbolic images, laboratory classes, etc. In this case, the results of education are active research, discoveries, games [6] and are distinguished by their effectiveness and ease of use in comparison with other methods. The exploratory method serves to study methods, objects, and the circumstances that affect the process. Methods such as modeling, i.e., the formation of identical appearances of real objects, the study of environments or states in motion, cannot be replaced by other methods [7-8].

Computer access is divided into:a) organization of the educational process (preparation of course schedules, electronic documents, etc.); b) preparation of teaching aids; c) computer user to solve practical problems in education, computer modeling, design, study of basic programs; g) computer training using specially designed programs (disadvantages: not taking into account the principle of didactic convenience); d) using a computer to receive and work with information from the Internet; e) establishing a teacher, parent, student relationship with the university site.

Spatial (3D, 3D) capabilities are limited in Microsoft Power Point. Since the lesson schedule is also tailored to different audiences, the teacher loses a lot of time to cover the same topic in each room. Computer capabilities will help him to overcome these difficulties.

A presentation will be prepared for the lesson in Microsoft Power Point. During class, the main attention is focused on the screen with the help of a multimedia projector. This is a convenient method of teaching, and the study of the material is facilitated by the clear and planned drawings, diagrams, tables, chemical reaction equations that the student should write down in his notebook. You can then revert the previous entry at any time. Multimedia presentation ensures that information is received by several sensory organs, as well as its long-term and high-quality retention in memory.

Delivery of training material to the student in the form of a multimedia presentation will reduce the time of learning.

In addition, it is possible to control audio and video, enter animations, combine all possibilities into a single multimedia presentation to create special effects. In this case, the presentation may also include a video fragment of the chemical experiment. Although the naturalness of the experiment is lost, it is possible to conduct it conveniently and easily summarize the studied material or reduce the duration of the experiment that lasts longer (for example, experiments on metal corrosion) [9]. It also provides an opportunity to conduct chemical experiments in the study of toxic substances in the virtual world without risking human health. If the laboratory does not have the necessary equipment for practical work, it is possible to conduct such work using a computer.

Thus, the use of computer technology will enrich the chemistry course with experiments. Students who are unable to attend classes due to illness can also benefit from such presentations.

It is advisable to use multimedia presentations at different stages of the study of the topic and lessons, such as mastering new material, processing the acquired knowledge and novelties (through solving tests), as well as conducting chemical experiments .

Results of physical and colloidal chemistry using computer technology

Throughout the formative experiment, topics were presented in the form of presentations. In this, each session was demonstrated through beautiful slide animation. This will make the content of the lesson interesting, logically fluent, visual and beautiful. Innovation increases students' interest in science. Students take part in different forms of creativity (hearing, speaking, working in front of a blackboard).

During the experiment, test questions were distributed on the topic to strengthen the knowledge of the students of the group.

On the basis of test results, the following values are calculated: mastery coefficient.

Mastering is calculated by the following formula :

$$Y = \frac{(K_5+K_4+K_3)\cdot 100\%}{N} (1)$$

At the same time, the number of K5- „5" grades; N- number of students.

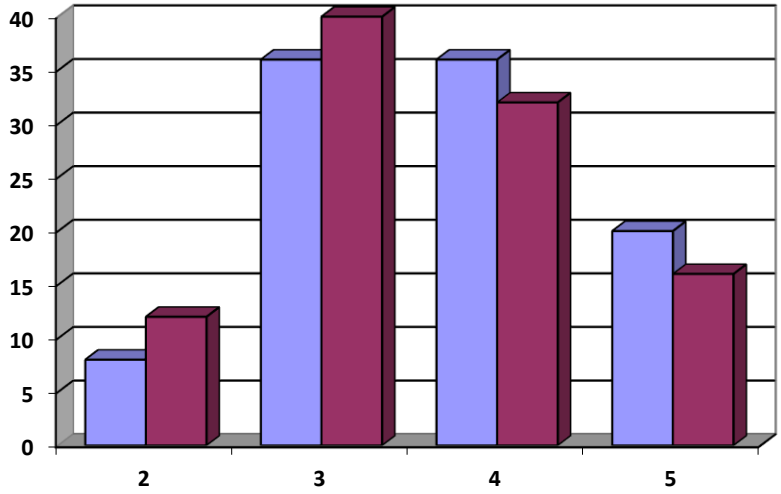
K4- „4" Baholar Soni;

K3- „3" Baholar Sony;

The obtained mastering value and test results are presented in Table 1 and Figure 1.

1 Table Assessment of students' knowledge

Number of students	Test number	Grades								Mastery Level, %
		2		3		4		5		
		№	%	№	%	№	%	№	%	
25	1	3	12	10	40	8	32	4	16	88
	2	2	8	9	36	9	36	5	20	92



Grade, score

Test Results

The test results show the dynamics of progress in the level of mastery. These data show that it is effective to apply the methodological guidelines detailed in physical and colloidal chemistry classes using computer technology. The criterion for evaluating the correctness of test tasks is the knowledge acquisition coefficient. Coefficient of knowledge assimilation is calculated by the following formula:

$K_{y,3} = \frac{P}{m \cdot n}(2)$

In which p is the number of correct answers;

m-the number of all questions;

n-talabas soni;

2 gadval. Assessed test results

Question number	*Number of student comments*								*Knowledge Absorption Coefficient*	
	Test № 1				*Test №2*					
	Amount	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*		
	Of these,									
	Correct		*Incorrect*		*To'g'ri*		*Correct*		*Test №1*	*Test №2*
1	*19*	*76*	*6*	*24*	*22*	*88*	*3*	*12*	*0,76*	*0,88*
2	*17*	*68*	*8*	*32*	*23*	*92*	*2*	*8*	*0,68*	*0,92*
3	*21*	*84*	*4*	*16*	*24*	*96*	*1*	*4*	*0,84*	*0,96*
4	*17*	*68*	*8*	*32*	*22*	*88*	*3*	*12*	*0,68*	*0,88*
5	*22*	*88*	*3*	*12*	*22*	*88*	*3*	*1`2*	*0,88*	*0,88*
6	*19*	*76*	*6*	*24*	*24*	*96*	*1*	*4*	*0,76*	*0,96*
7	*20*	*80*	*5*	*20*	*22*	*76*	*3*	*24*	*0,80*	*0,76*
8	*22*	*88*	*3*	*12*	*20*	*80*	*5*	*20*	*0,88*	*0,80*
9	*20*	*80*	*5*	*20*	*24*	*96*	*1*	*4*	*0,80*	*0,96*
10	*21*	*84*	*4*	*16*	*19*	*89*	*6*	*11*	*0,84*	*0,89*
O'rtacha qiymat	*19,8*	*79,2*	*5,2*	*20,8*	*22,2*	*88,8*	*2, 8*	*11,2*	*0,79*	*0,89*

Table 2 shows that computer-aided methodological instructions help to improve the quality of education, ensure its completeness, make it visual and accessible.

At the same time, students not only acquire new knowledge, skills and innovations, but also correct mistakes in them.

These increase the physicist's interest in the science of colloidal chemistry, mainly encourage thinking (analysis, synthesis, comparison, classification), while at the same time driving the activity of perception, which increases the sacrificial nature of the process.

Conclusion

It was found that the use of computer technologies in the organization of chemistry lessons significantly increases the effectiveness of the educational process. In the process of research, it was proved that digital tools provide a wide opportunity to consolidate students' knowledge, visualize complex chemical processes and connect theoretical knowledge with practice. Interactive programs, virtual labs, electronic textbooks and multimedia materials enhance students' interest and activity in subjects and develop independent learning skills.

Also, the use of computer technology allows the teacher to effectively plan the lessons, organize the educational process from an individual approach and fairly assess the knowledge of students. The digital learning environment serves to save time in classrooms, rational use of resources and widely adopt innovative approaches to teaching chemistry.

In general, the integration of computer technologies into chemistry education is an important factor in improving the quality of teaching, the formation of research skills in students and the development of competencies that meet the requirements of modern education.

References

1. Гузеев В.В. Образовательная технология как научная дисциплина. Химия в школе. -2002. –№. -С. 51-56.
2. Амирова А.Х. Учебные на уроках химии . Химия в школе. -2002.-№ 7. –С. 37-40.
3. Дрижун И.Л. Технические средства обучения в химии: учебное пособие для пед. Вузов.- М.:Высшая школа, 1989. -175с.:
4. Мещерякова Э.В. ,Махонина В.И.Использование комьпютеров в обучении химии . // Химия: методика преподавания в школе. -2002. -№4. –С. 55-60.
5. http://www.ziyonet.uz
6. http://www.chem.msu.ru
7. http://www.chimfak.sfedu.ru
8. Golish L.V.,Fayzullaeva D. M. Pedagogik texnologiyalarni loyihalashtirish va rejalashtirish:O’quv- uslubiy qo ‘llanma.Innovatsion ta’lim texnologiya seriyasi.-T.:”Iqtisodiyot” nashr.,2011. 206 b.
9. Tojiev M., Ziyomuhamedov B., O ‘ralova M . Pedagogik texnologiya va pedogogik mahorat fanining o ‘quv mashg ‘ulotlarini loyihalash: Toshkent-2011. 12 b.