

## The computer based technology of teaching quantum physics

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**Abstract.** Lines of physic polytechnic choice on quantum education of appearing advantageous methodical system. Advantageous line uses and different learning aspects in new innovational way, methodologies, an effective ways of using it concentrating on informational technology was shown in secondary education teaching. Quantum basis of conceptual of us research momentous change examines what inculcates, traditional method material lecture of innovation according to the course of physics. Innovative education as theory ongoing teaching, methodology of different aspects was examined in middle school education. The role of quantum physics industrial innovational technological is discussed in middle high school education. The main points in quantum physics are examined there. The role of computer in teaching and its effective ways of using informational technology are shown. And also the importance of connection between quantum physics with other subjects and successful ways of polytechnic teaching methodology and its methodical system aspects are shown.

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### Introduction

Nowadays the use of informational technology is getting way more successful in our everyday life, in exchanging various information. Therefore the special society is been created based on computer technology. The first important requirement for our young generation is to create that culture focusing on technology of information. Pointing to this, the first important step is to develop the critical thinking of school children, focusing on their scientific based actions and create an effective teaching methodology to enhance their education level. The practical action result will be more efficient in preparing future teachers to use new technology. Professional training on computer modeling and informational technology and special system will be required [1, 2].

Aim of work: to expose new elements of learning quality using new technological ways for teaching development of quantum physics.

Object of work: Application of computer technology in teaching physics

Article of work: The process of teaching physics in middle school

Prognosis of work: if we apply computer technology and its elements (model, Innovational lessons, electronic textbooks, interactive systems and internet resources) then the successful way will be achieved in educational process of teaching physics.

Following the rightness of prognosis that was given, duties for research verification that turned out are:

- Reading basic directions program on industrial innovation development of study;
- Science on educational process applies achievements of technique;
- Exposition of didactic materials in educational process;

The importance of practical work: As the result of investigation in middle school student physics course, the methodical approach was made during quantum physics course prepared few elements to methodical material which will help student and teacher as means of using [3, 4].

### Method of scientific research:

- Theory discussion;
- Learning the effective practical way;
- Discussion on methods of innovational education
- Pedagogical experiment;
- A method of comparison;
- Discussion of practical teaching
- A laboratory work.

### Material and methods

In today's day society requirement associates new way of teaching, which is noticed, a country knowledge industry mulching-orientation teaches and

ennobles moves and decision role information is given.

According to this, information nowadays remains, as knowledge system of the main directions examined before and different didactics and pedagogical knowledge industry of informative technology applying widely is a duty, which decides the most important attributes out of it.

Also nowadays informative literature informs knowledge system methodology and practice discusses, teaches and education psychology-pedagogical duty decides what is directed nowadays towards the advantageous informative technology which applies providing tendency of account examined.

Forms of system teaches only what technology bringing and informative technology contributes to improvements, school student informative culture forms a duty of one mutual dense association, viz. reads process nowadays epoch new informative technology me teaches technical means inculcates requires [5, 6].

What country is nowadays informative technology applies me develops level, material base development hardens, at first, society intellectual level, only what knowledge summarizes, masters and applies knows ability turns out. All finally, system of knowledge country by a level development and associated by a problem forms informing.

To the connection by technology means economy, science and urgent development culture basic condition that is being exposed.

That and what scientist in nowadays time decide knowledge specialist one the question, necessary information correctly grow - to choose what searches, to discuss and conversant necessary to master what applies him. Works talk on today is a day by research of nature on public presence of sciences and conducted by the help of models. Computer different in processes models organized detachment and numberless experiments to carry out with her through to choose scientific, to estimate and to investigate lead strong means is all known.

If so are, in business education computer only what technologies, in that a number today's requirement of day constantly applying computer modeling seat.

Through computer modeling object or the phenomenon exact or go on the screen evidently to depict him parameters that was produced from an idea, internals found conformities to law, possibility. It science very necessary to knowledge question first.

## Discussion

Direction, that widely used facilities on tendency for reading facilitation mastering of

quantum physics different evidentness. But, demonstration, that is possible in that time, that read what it division, to specify, number of experiments middle at school not much. Therefore from experience except pictures, drafts, graphics, track photo, placards, and dispositive and apply computers models. According to that before, fundamental experiments illustrated correct (divide from everything, splashes, experience of Rutherford, Frank and experience and etc of Gertz), and also, part, facilities, strengtheners, atomic reactor, that register, atom power station and etc to explain principle is needed [7, 8].

This the division reads time "The photoelectric effect", "Photocells and I am", "Used light pressure", "Radioactive and atomic kernel", "Peaceful aim energy", "Studies movie" atom power level discrete (Frank is experience of Gertz) ", "hydrogen atom line spectrum nature" film fragment, " nuclear physics track means", "revives part strengthener", "this peaceful atom", "atom and an atom nuclear structure", "atom kernel" dispositive and table.

Heating the phenomenon of radiation before middle on course of physics school not considered. This- nature same spacious spreads light produces one kind look historical stands looks, first one time light quantum nature idea M. Plank exactly this the phenomenon memorizes motion grounds. In general, "quantum concepts of physics" formed the photoelectric effect touch line spectrum help radiation studied- and teacher warmth, that as conformities to law will harden the phenomena. These the states taking into account, school entered to the course of physics material. Basic internals of features to the outage to control warmth radiation is possible leaning to explain. For example, lost, when warmed body, of her dinner to change students conversation, question- to characterize through an answer. Heated after body produces ray wave length and temperature increases ravine kemi gives, exact talks, body temperature the absolute 0 is high, a warmth radiation notices explains is necessary. But subzero temperatures not enters radiation waves of light, at that could be seen wave-length, interval. Ravine, temperature was high in that, wave-length gives kemi, and body, that was sufficiently heated in a kind on high temperature, blushing, begins. Dinner of light, that went out further, revolved is yellow, going after turning white, bluish to dinner. Warmth is first radiation nature - one is equality radiation on a melody. Sufficiently paid attention in a kind, explain her to the students. Inculcate from it concepts of R power sparkling closeness of spectrum and integral power sparkling after the phenomenon describing basic physics possibilities[10].

After it body we explain black concept of body possibility of ability energy spectrum swallowing of emitted inculcating, the absolute.

Law of Kirchhoff not obligatory, maybe on time of material at level given, therefore we him think physics - in classes on direction of mathematics it theme to pass locally talk.

Methodical system, only what innovation created that education in time of process quantum division of physics teacher middle, that appeared on it work, at school, checked up pedagogical experiment hundredth. Pedagogical experiment conducted on such the aim:

1. Students level of knowledge necessity introduction methodology only what educing, to expose.

2. Terms innovation direction increase course of physics educating of quantum on in process to expose and to form them knowledge of students the impression that touches, quality and to value side number.

3. Given methodology experiment hundredth checks.

Put accordingly such obligate, that to arrive at aims, that was named it,:

1. Examined exact to the states questions methodology verification experiment that corresponds.

2. Control, that was dedicated quantum teaches course of physics to form skills of students on in process, system of tasks to organize detachment.

3. Experiment students of class necessary didactics provide materials.

Applied basic methods, we appeared that in time driving pedagogical experiment on a bottom:

1. Skills of knowledge works and control accounts, quantum prepared that according to the course of physics, in written form through a sale students to expose.

2. To works answers orally students and control to do analysis.

3. To control educational process.

4. Pedagogical result of experiment statistically stands grow.

Not and traditional methodology educating in class control was used. Different didactics, that was dedicated to the teachers by experiment in motion of preparation, given plans of lessons materials, experiment [11].

To Investigate preparations of students, inclinations associate practice to the questions to answer nowadays by an epoch by a technique and by a production from to expose began. These questions such the questions enough: 1) quantum the phenomena on course of physics laws to open the use

on a technique; 2) students new materials on a production to acquaint by basis of physics;

Everyone executed works of that experiment and controls students of class control in character after theme only what physics-technical. Works of what it control, students two classes discussion to compare level of knowledge allowed. To master element of knowledge counted coefficient below are formula:

$$K = \frac{n}{N} \cdot 100\% \quad (1)$$

Local n - correct number of answers, N - common number answers.

To Investigate and was controls lead flow beret middle of education two 11th class school taken. First class - was control class (21 students), second class - talk, that experiment broke (20th student), taken. Equal index of quality and two classes. Only what innovation knowledge indexes test and these two to the classes by control the best conducted, of class were taken: control class - 53 experiment broke - 55.

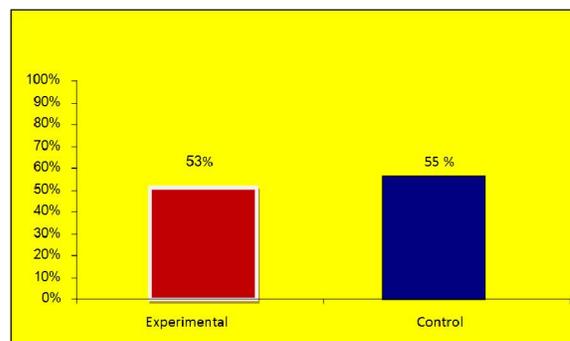


Figure 1. Diagram I

To class control after that according to daily to the methods conducted lesson, and method-methods for driving to the classes forming of experiment form special plans of lesson, lesson were organized.

Table of results to discuss specifies difference experiment class quality of knowledge in results students of class on control. Information in it table specify experiment students of class degree form mastering students of class on to control, when looked at a degree form mastering, superfluously be.

Character in it percent type of diagram index appeared on a bottom.

Diagram II pedagogic experiments depicting results.

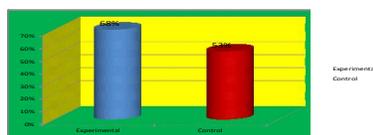


Figure 2. Diagram II

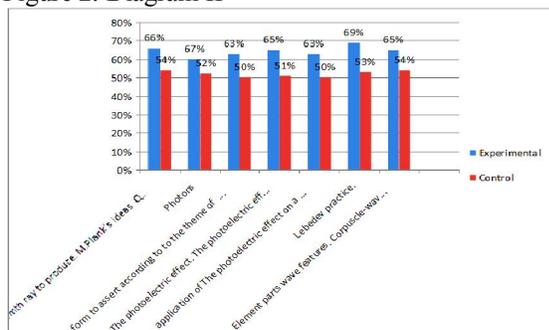


Figure 3. Diagram III

Below indicates allowed performances of job experiment resulting in conclusions.

Computer programs was advantageous during

That, experiment educed that methodical system that was dedicated to discuss to form informative technological knowledge students, bulb deeply masters material influences, result educating.

## Results

Methodical system education course of physics teaching quantum was used to investigate in process opening. Based on its methodical basis of the system to the students bases of technique to teach, suggestions, that was dedicated innovational forms skills of qualifications and therefore is done.

### Work results:

1. Methodology, that teaches nowadays epoch basis of physics production, was organized
2. Innovational teaching method in middle schools
3. Interdisciplinary connection role was organized:
  - a course of physics to the top to the students of class quantum on to teach was physic's associate interdisciplinary was divided by chemistry, by biology, by labor system of connections taken.
  - basis system forms and methods, carries out the interdisciplinary
4. System course of physics and Innovation formation of quantum on educational in process created.

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5. Knowledge of innovation quantum was given on the system of lessons, applied that computer that extends, technology, according to the course of physics students.

## Conclusion

Quantum physics division teaches in process to form increases created in methodical system model and to inculcate efficiency of pedagogical experiment based on result: experiment class student knowledge level controls class compares possibility of growing to 13. Our organize detachment methodical system to the program reading to the aim education introduction to arrive at, to improve educational process, a student was physical person in detail develops much the impressions touched.

When concluding, we took according to the course of physics offered in the system of the students' quantum deep knowledge.

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