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PROBLEMS OF TEACHING TECHNICAL SCIENCES

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Abstract:
This paper is devoted to the problem of creating a downloadable program for each subject, that can be used in teaching students and does not require the study of a separate programming language for its preparation, but rather the use of common and currently used programming languages.

Keywords: Information and communication technology, virtual laboratory, software package, torque, friction extension.

1.INTRODUCTION:

It is known that a lot of work has been done around the world to increase the range of machines created on the basis of scientific and technical research, to improve them and to introduce them into production. The main emphasis here is on the in-depth knowledge of the seeker to create accelerating technical devices. It is no secret that the development and popularity of information and communication technology, while making it much easier for researchers, leads to increased competition in the production of competitive machines and their equipment. It is obvious that strengthening the role of researchers in the socio-political processes in society, the implementation and improvement of innovative ideas, is one of the key issues facing society. This is explained by the fact that the researchers are given a thorough knowledge and are able to put into practice the knowledge they have acquired in the future. This is the main task facing every professor and teacher currently working in a higher education.

It is clear that there are different ways to educate researchers. One of the main methods of teaching is the use of "information and communication technology", one of the most advanced technologies of today. Education today relies on the widespread use of modern, tried and tested teaching methods that are entering the world. "We need professionals with forty years of education, not four or even six years," said the president of General Motors, which is clearly a great truth. However, no matter how much pedagogical skill you have, there are events that are difficult to explain in words. A simple example is to imagine the movement of a car engine piston in a unit of time, depending on the thinking of the consumer listening to you. But now, showing this movement on a computer ensures that the listener quickly develops a clear understanding. A complex example: when does the value of the torque acting on the car engine shaft drop the most? The answer to this question is explained on the basis of theory. But to show it at work, again depends on the computer tool.

2.LITERATURE REVIEW.

It is known that today, along with traditional education, distance learning is becoming a field of education. Many experts in this field are conducting research abroad [1-8].

D.A. Starikov, associate professor of the Department of Information Systems and Technologies FGAOU VPO "Russian State Vocational Pedagogical University", according to the results of the research of the candidate of pedagogical sciences:

- A number of authors (E.A.Medvedeva, L.A.Nagornaya, L.K.Shiyan, etc.) advocate the use of media culture in teaching, citing the fact that the lack of media education in this area is currently an obstacle. The main reason for this is the lack of professional training of professors and teachers in the widespread use of software in the culture of education.

- It is very difficult for some authors (E.Y.Kogan, R.Lauterbach, Y.A.Pervin, I.Robert, Y.Senin, K.Frey) to come to a definite conclusion about strengthening the use of media culture in teaching. Because they believe that this can lead to the humanization of teaching.

Young people studying distance learning in the technical field will have to do laboratory work in many disciplines. But what if they don't have such equipment in the workplace? At this time, it is natural to use a virtual laboratory work program. Currently, such laboratory work programs can be found on the Internet. In this case, the

professor has an additional work situation in front of the teacher. That is, he must first learn how to use it himself. In addition, these works are not provided free of charge.

But it can be said separately:

- There are many software packages now that you can use to organize your laboratory work. However, in order to do this, the professor-teacher will have to study not only his work, but also the package.

Here are some of these packages:

STAR (Software Tools for Academics and Researchers) is a program developed at the Massachusetts Institute of Technology (MIT). The program is used for biology, biochemistry, genetics and hydrogeology. Many additional programs are written in java or html. The legal website of the program is http://star.mit.edu.

VirtuLab is a project designed for physics, chemistry, biology, ecology. Virtual laboratory work is based on Flash technology. In it, the experimental parameters and results are given in advance by the programmer, and this condition prohibits going beyond the parameter value. Its main achievement is that it can be understood by the learner, even in the absence of laboratory equipment. Legal site VirtuLab: http://www.virtulab.net/.

According to M.P.Lapchika, V.R.Mayera, D.Sh.Matrasov, the use of information technology in the classroom makes it easier and more understandable for students to improve their skills in the field. [1].

A.O.Matlin, S.A.Formenkov [9] propose to organize virtual laboratory works and their devices in the author's way on the basis of the following algorithms:

1) Creation of management of virtual laboratory work;
2) Selection of a graphical representation of the management of the virtual laboratory work;
3) Selection of active sites for virtual laboratory work tools;
4) Select the Graphics toolbox;
5) Interdependence and means of active areas;
6) Description of the set of tools;

3.THE MAIN PART.

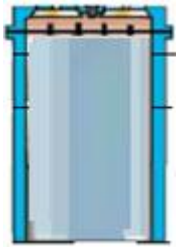
At present, the subject "Informatics and Information Technology" is taught in Higher Education. However, in the teaching of this science, the teaching of physics mainly on the basis of mathematical concepts and the teaching based on some other specific specialization are neglected. In the teaching of "Computer Science and Information Technology" specialization is almost not taken into account. If these science topics are chosen based on the direction, it can be considered appropriate.

Importance of software development on the topics covered [2]:

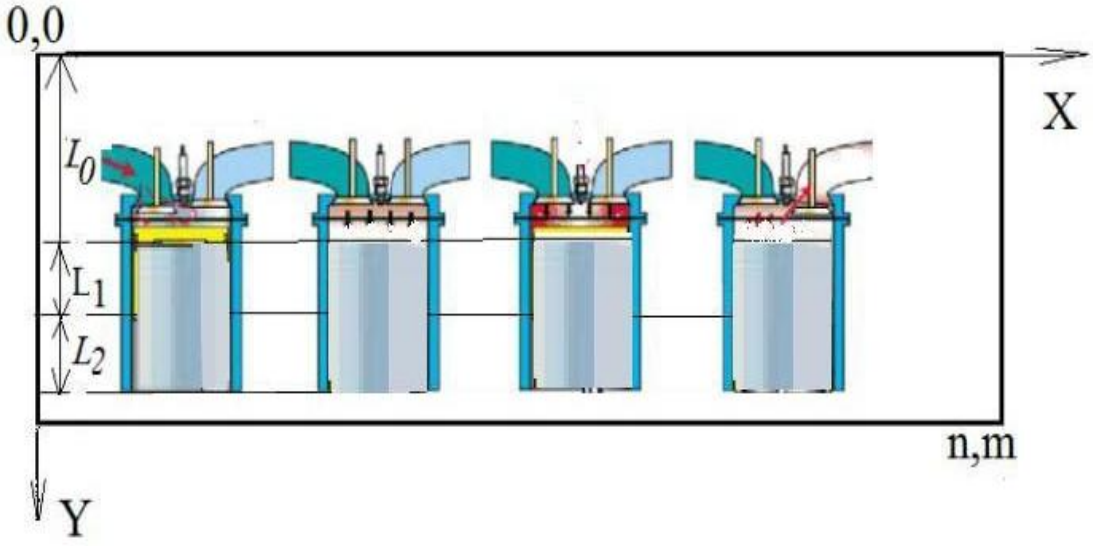
- Refusal of various exhibitions during the lesson;
- Automation of actions (operations);
- Always ready for work;
- Easy to upgrade and does not require financial resources due to modern requirements;

For this purpose, we present the algorithm of the program for studying the movement of the car engine piston:

- The following pictures are prepared in advance;



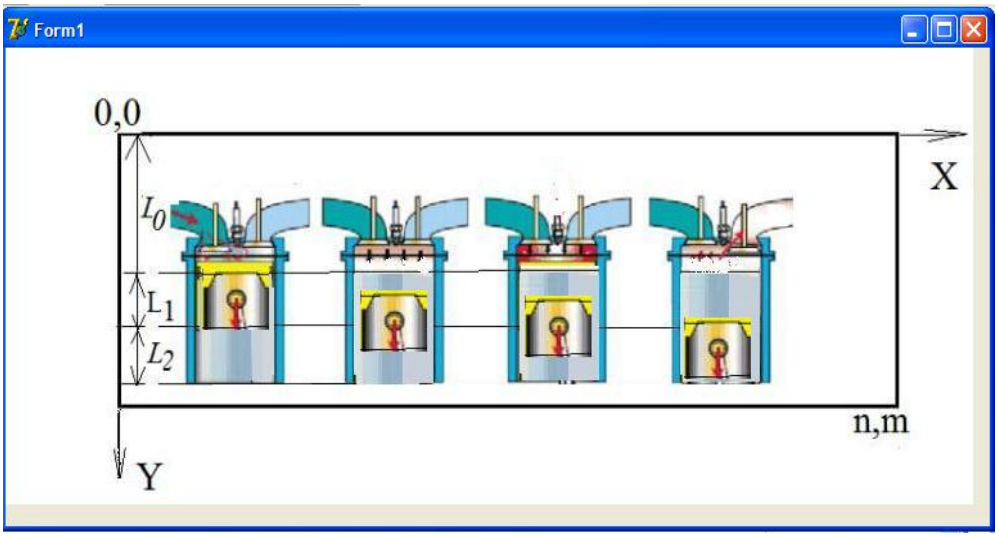
- Picture coordinates (L, Ly) to generate piston motion;
- Using the Time, which is a system function, the visibility of the piston on the monitor is changed;



- The image coordinates are changed due to the cyclic execution of operators;
- The beginning of the cycle should be from 0 to 90;

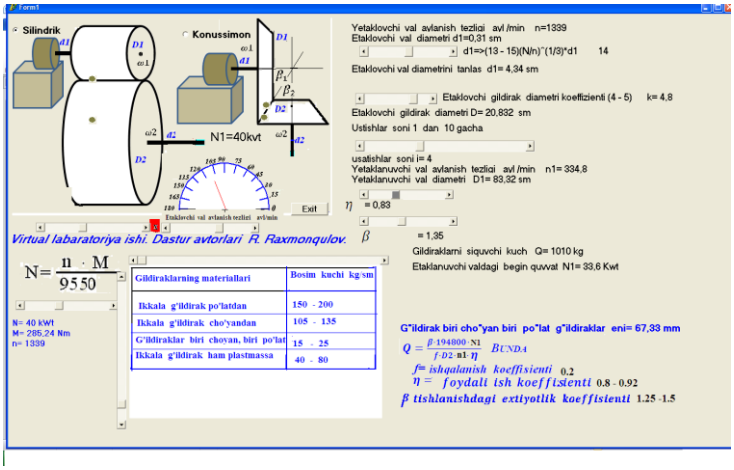
A screenshot of the program based on the above algorithm is shown in Figure 2.
For the sake of brevity, the program text was not cited. It is not the language in

Figure 2



which the program is structured that is important to the user, but its intelligibility and simplicity.

Figure 3



Created with the participation of the author and currently used in the classroom for the topic "Friction extensions"
It is necessary to stop on the program [10].
As can be seen from the figure, the principle of operation of the friction transmissions

In addition to the display, it is possible to change the mechanical parameters using visual rulers. Some of them are:

- Engine power; kw
- Wheel material;
- Wheel rotation speed rpm;
- Leading shaft diameter mm;
- Drive shaft safety factor;
- Number of transfers;

If students are asked a question on a topic by simply changing the above parameters, they will have the opportunity to ask 720 different questions.

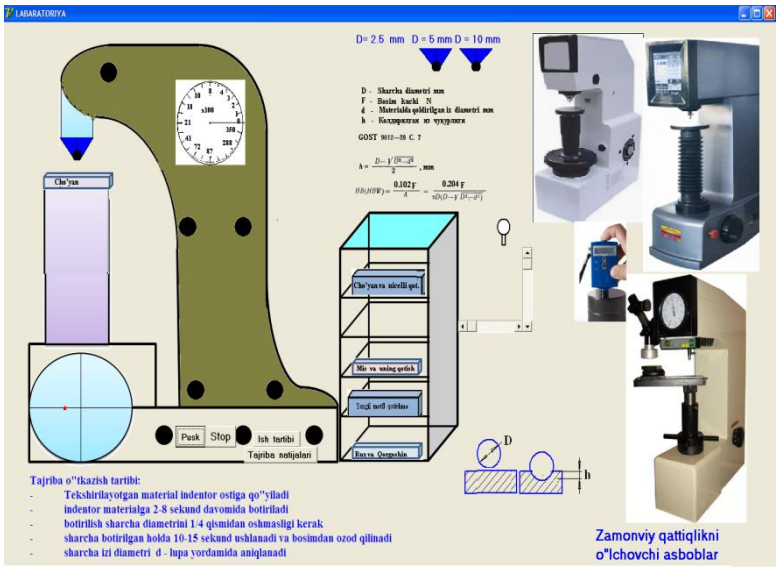
The most important thing is that the results obtained through this program can be used in the design. Moreover, since the authors are our own, we can change it as much as we want based on the requirements of the enterprise.

Example 2: A screenshot of a virtual laboratory work program [11] for determining the hardness of materials by the Brenell method is shown in Figure 4.

Software options:
- Selection of the type of test material;
- Selection of ball diameter;
- View the work sequence on the monitor;
- Be aware of modern measuring instruments.

The above application capability cannot be implemented by PowerPoint, which is widely used in practice.

Figure 4



4.IN CONCLUSION,

It can be said that at present, the topics of computer science and information technology should be chosen in the field of specialization, rather than in general. It is also time to prepare a set of downloadable programs in accordance with the report with the help of student youth. This will allow our students to understand the topic quickly and easily. We think that this will again be a worthy response to the call of 1000 programmers to the youth of our country.

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