

2024 4th International Conference
on Technology Enhanced
Learning in Higher Education
(TELE)

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Welcome to TELE2024!

Dear conference participants,

it is a great honor and pleasure to welcome all of you to the 4th International Conference on Technology Enhanced Learning in Higher Education (TELE).

The increasing interest of researchers to the problems discussed at the conference, numerous positive feedbacks – all this led us to the idea to organize in 2024 the next conference, the main objectives of which are the identification and systematization of current issues and current trends in the field of education digitalization, the exchange of results of leading scientists, research schools and representatives of business.

TELE2024 program includes topics of interest that consist of:

I. Computing & IT Education

- Smart classroom, virtual and remote labs, robotics in educational sphere
- Innovative learning spaces
- IEEE Standards in the classroom

II. Workplace and Industry-Based Learning

- Effective learning activities, innovations, methodologies and practice
- Adult, lifelong learning and professional development
- Interdisciplinary, multidisciplinary and transdisciplinary learning experiences

III. Open, Flexible & Distance Learning

- Online/E-learning/M-learning spaces
- Infrastructure and educational technologies
- Open educational resources, courseware

It is noteworthy that researchers from 11 countries take part in the conference. 121 papers were submitted and only around 103 best paper according to the reviewing results were approved and are going to be presented during the conference.

Please have a look at the conference program to find out the most important themes for you. We wish you a productive conference and fruitful collaboration and beneficial cooperation!

Welcome to TELE2024!

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The Use of Virtual Interactive Stands in the Educational Process in Higher Education

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Abstract—Information and communication technologies have become an integral part of modern society in Uzbekistan, as they are used in all spheres of human life: economic, political and social. Uzbekistan is one of the countries where digital technologies are rapidly developing, because of which significant results have been achieved in education. The expansion of distance education will improve the quality of education, because more students who live in rural areas are covered. This will allow you to receive high-quality content (video, audio, and platform); use the most up-to-date technologies and solutions: online services for the educational process, gamification, a virtual library, online proctoring and practical online classes. Interactive learning is a learning process using information and communication technologies. Although distance learning is not a substitute for university attendance, it is an excellent learning tool for consolidating knowledge and obtaining additional facts and information. Sometimes homework is not enough for proper understanding and assimilation of educational material. Proper understanding of information is useful for practical subjects. The Internet provides a wide range of such additional features. Interactive stands enhance both general and professional knowledge; have a motivating effect on learning in a playful way. The National Research University in Uzbekistan, together with the teachers of the Tashkent State Pedagogical University, is actively working on the introduction of virtual interactive educational stands into the educational process, including distance education. The computer program provides for the implementation of training lessons in the section "Logical foundations of computing systems", namely "Representation of functions of the algebra of logic", "Minimization of logical functions by the Veitch diagram method", "Minimization of logical functions by the Quine method"

Keywords—information technologies, educational technologies, self-education of students, interactive learning, interactive stand.

I. INTRODUCTION

Information technology and the Internet are rapidly penetrating the field of education. Education is a very important area for any country. It is thanks to education that

success in further development is ensured. Given the fact that it is especially necessary to take into account the trends of the modern century in this area, information technologies in education are particularly popular.

First of all, information technology and the Internet allow you to receive information in any quantity, and not be limited to the words of a teacher and a textbook. The ability to use the Internet has become indispensable. Also, students were able to realize their creative abilities through various presentations and other things. Separately, it should be said that new information technologies in education have allowed completely new projects to appear:

- Self-education. Now you can study almost any field on your own thanks to the huge amount of open information. And for this you do not need to go to archives and libraries – it is enough to have a personal computer with an Internet connection.
- Distance learning. Higher education is certainly very important, but there are people who live too far from institutions, or they do not have enough time. Remote completion of assignments, projects and sessions is a great way to replace the classical form of learning. Many people choose online courses and seminars. Distance learning is a type of learning that students can do without being physically in the same place as the teacher. Due to the variety of course types to choose from, there are more and more educational opportunities.

The well-known health crisis has prompted research teachers to rethink their teaching method and increasingly develop open and mass online courses and adapt them to large and diverse audiences.

- Online communication with the teacher. This applies to tutors who can now teach via Skype and other platforms, as well as the opportunity to study languages with them or get a new profession that is not too difficult [1-2].

The main advantages of using Internet technologies in education. The modern world is characterized by the rapid development of information and communication technologies. Every day computer technologies replace the usual and already traditional methods of obtaining information. Education is no exception. Internet technologies perform an important function – the dissemination of information flows. Thus, they form a global space.

The advantages of the introduction of Internet technologies are as follows:

- Automation of the learning process;
- Qualitative improvement of the level of knowledge;
- The possibility of distance learning regardless of location.

Due to the fact that such technologies include graphic and sound elements, this is of great importance in the process of self-assimilation of information. The most important advantage is that the training can be conducted from completely different points. This allows you to significantly save time in case of unforeseen situations [3-5].

Today, information technologies are rapidly developing in Uzbekistan, and this is reflected in education. The problem of using computer and information technologies in the educational process, wide access to the global Internet information system is relevant and is being solved at the state level [6].

An electronic Hemis platform has been created in Uzbekistan for teachers and students of higher educational institutions. This platform provides students with access to educational materials - lectures, presentations, practical, laboratory work, videos, assignments, etc. It is possible to monitor the schedule of couples and the homework received, reports on the completed course are automatically generated.

For teachers, Hemis makes it easy to manage course materials, set grades, and communicate with students. Teachers can post course announcements, assignments, and reviews, as well as track student progress throughout the semester.

Through this service, teachers can give their students homework, and they, in turn, send finished papers. At the same time, you do not need to print out completed assignments and take them to the university. Everything happens in a remote format via a mobile program.

The electronic service also stores other information related to the educational process. For example, users can view the number of hours allocated to study a particular subject. In addition, users can view a virtual version of their credit card.

Features of the Chemis platform:

- Free program for students and staff of higher educational institutions;
- The service is designed for higher educational institutions of Uzbekistan;
- Availability of an up-to-date couples schedule;
- Virtual record book;

- The ability to translate part of the learning process into an online format;

- The program interface is available in Uzbek;

- The service client runs on current versions of the operating system;

- Remote receipt and delivery of homework.

Hemis is a modern and user-friendly online educational platform offering a variety of courses in areas such as business, technology and healthcare. Its dashboard allows students to access course materials, communicate with professors, and track their academic performance. By following the tips on using Hemis effectively, students can maximize their learning experience and achieve their academic goals [7].

Proposed Methodology

Resources that Provide Information and Communication Technologies in the Field of Education.

To outline a brief typology of resources provided by IT technologies, we will allocate 5 resource families:

Resources that provide information and communication technologies in the field of education can be divided into the following areas:

- Data banks and information (digital documents: texts, images, videos) that can be used by a teacher as educational materials and illustrations or which can serve as a source of information for students during their studies.

- Digital guides enriched with new data (e.g. videos) and a navigation tool.

- Tools for work (simulators, virtual laboratories) that can adapt to the level of students, their goals and their life path.

- Simulators, expert systems that allow you to simulate the phenomena under study and change their parameters,

- Devices for teamwork, networking and communication.

There are many examples of existing tools. They range from a simple tutorial to an e-learning platform. And, first of all, the methods of using tools vary among teachers. Currently, pedagogy is being formed on the basis of information and communication technologies, which originates in knowledge obtained from educational sciences [8-11].

In our opinion, interactive training programs are the most optimal among a variety of electronic educational materials for consolidating the assimilation of educational material.

Let's consider the features of interactive learning.

Interactive learning is a special form of organizing cognitive activity, a way of cognition carried out in the form of joint student activity, in which all participants interact with each other, exchange information, solve problems together, model situations, evaluate the actions of others and their own behaviour, immerse themselves in the real atmosphere of business cooperation to solve a problem.

Interactive learning is a special form of organization of cognitive activity, a method of cognition carried out in the

form of joint activity of students. All participants interact with each other, exchange information, solve problems together, model situations, evaluate the actions of others and their own behavior, immerse themselves in the real atmosphere of business cooperation to solve the problem. One of the goals is to create comfortable learning conditions, such that the student feels successful, his intellectual worth, which makes the learning process itself productive.

The educational process is organized in such a way that almost all students are involved in the process of cognition, they have the opportunity to understand and reflect on what they know and think. The peculiarity of interactive methods is a high level of mutually directed activity of the subjects of interaction, emotional and spiritual unity of the participants [12].

In comparison with traditional forms of teaching, the interaction of the teacher and the student is changing in interactive learning: the activity of the teacher gives way to the activity of the trainees, and the task of the teacher becomes to create conditions for their initiative.

During the dialogue training, students learn to think critically, solve complex problems based on the analysis of circumstances and relevant information, weigh alternative opinions, make thoughtful decisions, participate in discussions, and communicate with other people. To do this, paired and group work is organized in the classroom, research projects, role-playing games are used, documents and various sources of information are being worked on, and creative work is being used [13].

The student becomes a full participant in the educational process, his experience serves as the main source of educational knowledge. The teacher does not provide ready-made knowledge, but encourages participants to search independently and performs the function of an assistant in the work.

First of all, interactive forms of classes:

- arouse students' interest;
- encourage everyone's active participation in the learning process;
- appeal to the feelings of each student;
- contribute to the effective assimilation of educational material;
- have a multifaceted impact on students;
- provide feedback (audience response);
- form students' opinions and attitudes;
- form life skills;
- contribute to behavioural change.

Note that the most important condition for this is the personal experience of the teacher's participation in interactive training sessions. They can only be learned through personal participation in a game, brainstorming, or discussion [14].

The basic rules of the organization of interactive learning.

- Rule one. All participants should be involved in the work in one way or another. To this end, it is useful to use technologies that allow all participants to be included in the discussion process.

- Rule two. It is necessary to take care of the psychological preparation of the participants. The point is that not everyone who came to the class is psychologically ready to be directly involved in certain forms of work. In this regard, warm-ups, constant encouragement for active participation in work, and providing opportunities for self-realization are useful.

- Rule three. There shouldn't be many students in interactive technology. The number of participants and the quality of training may be directly related. The optimal number of participants is up to 25 people.

- Rule four. The room should be prepared in such a way that it is easy for participants to transfer to work in large and small groups.

- Rule five. Clear fixation of procedures and regulations. This should be agreed upon at the very beginning and try not to violate it. For example: all participants will show tolerance for any point of view, respect everyone's right to freedom of speech, and respect their dignity.

- Rule six. Pay attention to the division of the seminar participants into groups. Initially, it is better to build it on the basis of voluntariness. Then it is appropriate to use the principle of random selection.

Mandatory conditions for the organization of interactive learning:

- a trusting, positive relationship between the teacher and the students;
- democratic style;
- cooperation in the process of communication between the teacher and the students;
- relying on the personal ("pedagogical") experience of students, including vivid examples, facts, images in the educational process;
- the variety of forms and methods of presenting information, forms of activity of students, their mobility;
- inclusion of external and internal motivation of activities, as well as mutual motivation of students.

Interactive forms of learning provide high motivation, strength of knowledge, creativity and imagination, sociability, an active lifestyle, team spirit, the value of individuality, freedom of expression, an emphasis on activity, mutual respect and democracy [15-16].

II. RESULTS OF RESEARCH

Modern means of information support make it possible to create such programs in a multimedia format with maximum use of all means of visualization. Interactive training programs

create motivation for the qualitative assimilation of educational information, the ability to apply it in practice and form the student's competence in a given section of the discipline.

At the Department of Automation and Control of Technological Processes of the «Tashkent institute of irrigation and agricultural mechanization engineers» National Research University, together with teachers of the Tashkent State Pedagogical University, active work is underway to introduce virtual interactive educational stands into the educational process, including distance education.

The computer program provides for the implementation of training lessons in the section "Logical foundations of computing systems", namely "Representation of functions of the algebra of logic", "Minimization of logical functions by Veitch diagrams (Carnot maps)", "Minimization of logical functions by the Quine method".

When launching the program, the user is provided with an interface that indicates the names of the course and section offered for study (fig.1).

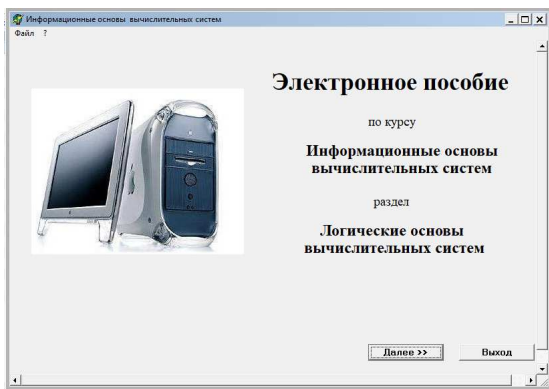


Fig 1. The main window and interface of the interactive stand

To continue working in the system, the user must log in to the system, to do this, enter the user name (login) and password. For users who are working in the system for the first time, it is necessary to register. After the user has logged in to the system, the user is prompted to select a lesson (fig.2).

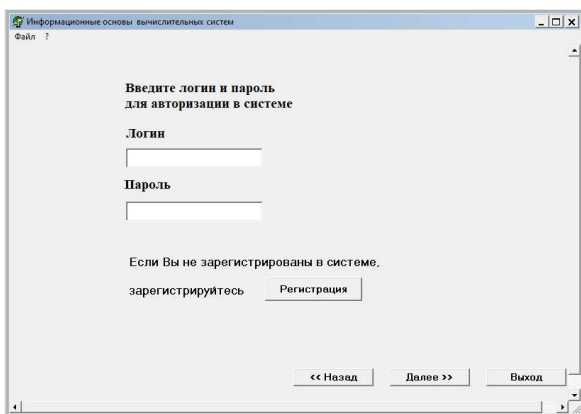


Fig 2. Authorization in the system

Let's consider the work of the program using the example of one of the modules of the lesson program "Minimizing logical functions. The method of minimizing Carnot maps".

The user needs to find the minimum disjunctive form of a logical function. In the lesson window, the initial data is offered - a function of the algebra of logic, set digitally and using a truth table. The user must fill in the Carnot card correctly according to the specified truth table. The value "0" is changed to the value "1" by double-clicking the mouse. You can check the correctness of the filling by clicking on the "Check" button. If the user filled out the Carnot card incorrectly, then when clicking on this button, the program will display an error message (fig.3).

After the Carnot card is filled, the user needs to select the minimum cover of all "1". In this program, the blocks are highlighted in red. After clicking the "Check" button, the cells that are supposed to be combined are selected. The selection is made by clicking on the desired cell.

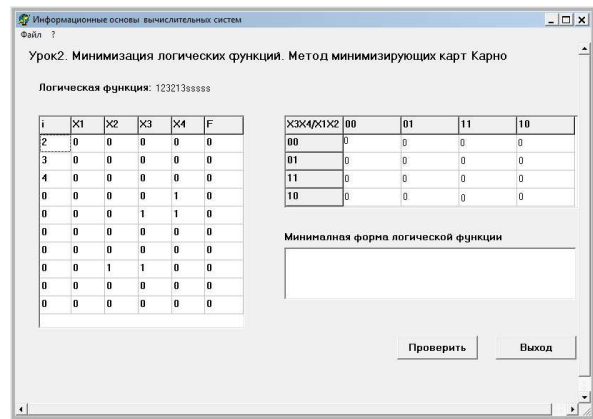


Fig 3. Interactive stand module - minimization of logical functions

If you are gluing units that cannot be glued together (for example, non-adjacent and non-opposite cells, or "0"), the program will display an error message. As a result of the correct selection in the lower field of the window, we get the minimum disjunctive form of the logical function.

The program provides a database with job options, the modification and addition and removal of which are included in the functions of the administrator. Each time the program is restarted, the user works with a new task option, that is, the selection of options is performed randomly.

The program was implemented in the Delphi 7 environment. As you know, this system is well suited for the development of multi-window user applications, the creation of multifunctional general-purpose systems, the design of databases of any complexity and database management tools, the creation of single and multi-user interfaces, the development of text, graphics, video and sound processing systems, writing programs using the Internet.

The debugging process is an integral part of creating any program. The program was tested throughout the development of the system.

III. CONCLUSIONS

Information technology in education provides a huge number of opportunities. Video conferences, tutorials, and lots of useful messages and materials make modern education very special. Life has accelerated its pace now, which is why it is worth paying attention to the fact that education should be completed in the shortest possible time and with minimal effort, but the quality and volume of knowledge should only increase.

The developed interactive software tool allows you to: to activate the educational process, individualize learning, increase the visibility of educational material, combine theoretical knowledge with the consolidation of practical skills, increase and maintain students' interest in learning. It is intended not only for teaching the subject itself, but also serves as a means of studying methods and ways of working with other information systems.

The practical significance of the work lies in the use of ICT, interactive forms and teaching methods in the process of teaching the discipline "Information foundations of computing systems" based on modular technology. All these methods allow you to gain experience in actively mastering a special discipline in conjunction with practice; developing communication and interaction skills in a small group.

There is also the development of skills of analysis and introspection in the process of group reflection; the development of the ability to resolve conflicts, the ability to compromise; the formation of motivational readiness for interpersonal interaction not only in educational, but also in professional situations.

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