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Proceedings

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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!

Table of Contents

2024 4th International Conference on Technology Enhanced Learning in Higher Education (TELE) | 979-8-3503-5353-2/24/$31.00 ©2024 IEEE | DOI: 10.1109/TELE62556.2024.10605621

The Introduction of Information Technologies into Educational and Laboratory Complexes Is an Important Step Towards the Digitalization of Uzbekistan

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***Abstract*—Digital transformation is one of the most important trends in the development of modern states, changing the appearance of virtually all spheres of the economy and the social sphere. The pandemic has hit many sectors of the economy, but has contributed to the accelerated development of the IT industry. It also showed the importance of introducing information and communication technologies and digital technologies into the work of state bodies, private enterprises, public organizations and educational institutions. One of the main tasks of the consistent socio-economic development of Uzbekistan is the widespread introduction of information, communication and digital technologies into education. This is exactly the area that represents an effective tool capable of ensuring high-quality reform of economic sectors and spheres of public life. The article examines the trends in the introduction of information technologies in various sectors of the economy in Uzbekistan, the issues of virtualization of the educational and laboratory complex of educational institutions of the country. As an example, the interactive virtual stand "Minimization of Mile automata" in the discipline "Theory of information processes and systems" is considered.**

Keywords—digitalization of Uzbekistan, information resources, educational and laboratory complex, pedagogical technologies, virtual stand, minimization of the automatic Mile

I. INTRODUCTION

The state is introducing digitization into all its industries. One of the main merits of the introduction of information and communication technologies is the reduction of bureaucracy and red tape in the registration of documents. ID cards and passports can be accessed online, where all data is stored and updated.

Today, the leadership of Uzbekistan is paying increasing attention to strengthening cooperation with foreign countries, in particular, in the direction of introducing innovations and advanced technologies. In this matter, it is impossible not to ignore the role and experience of the countries of the East, which demonstrate impressive growth rates of gross domestic product.

Such participants of the region as China, India, Vietnam and not only, today act as the locomotive of the global economy. Japan and South Korea maintain leadership in many areas of innovative and high-tech industries. Singapore, Malaysia and Thailand show exceptional achievements in exporting goods and services to global markets. And the United Arab Emirates, Qatar, and Saudi Arabia are making serious progress in the field of alternative energy [1-5].

All this is the result of a well-thought-out socio-economic policy. Strategic programs of measures for the integrated development of all aspects of the economy and public life are being developed and put into practice by governments. Also for Uzbekistan, which is currently engaged in solving similar tasks, the study of the experience of the eastern countries is of undoubted interest.

The last few years have become fundamental for the adoption of documents in Uzbekistan, which have laid the normative and legal foundations for further digital reforms. On April 28, 2020, a presidential decree "On measures for the broad introduction of the digital economy and e-government" was adopted. This document outlines the current issues related to the wide introduction of digital technologies in the work of domestic enterprises and public services, the training of IT specialists, comprehensive support for IT entrepreneurship and more.

The logical continuation of these works was the Presidential Decree "On the confirmation of the strategy "Digital Uzbekistan - 2030" and the measures for its effective implementation" of October 5, 2020. According to the document, all state duties and penalties are carried out using electronic payment systems online. In addition, over 400 information systems, electronic services and other software

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products are being introduced in various areas of socio-economic development of the regions.

The strategy "Digital Uzbekistan - 2030" provides for the approval of two programs (on the digital transformation of regions and industries), as well as "roadmaps" for their implementation. This will undoubtedly ensure the most comprehensive coverage and effective implementation of the document, which includes such priorities as the development of digital infrastructure, e-government, and the national market for digital technologies, education and advanced training in the field [6-7].

It is also known that, according to the document on monitoring the state of digital transformation in the regions, an assessment method for the digital development of the territories has been developed, which allows for a preliminary diagnosis of digitization on the ground. The criteria include the use of the Internet in social institutions (universities, schools, and clinics), the introduction of educational and other systems and software products, the coverage of computer science teachers and students within the framework of the project "One million programmers" and the number of IT educational centers.

Among the most important documents is also the resolution of the head of state "On Measures for the wide introduction of digital technologies in the city of Tashkent" of March 17, 2020. The comprehensive program "Digital Tashkent" approved by the document is aimed at the digital development of the capital of Uzbekistan.

The Development Strategy for the New Uzbekistan 2022-2026, adopted on January 28, 2022, includes seven reform priorities related to public administration, the rule of law, economic development, social policy, spiritual education, security, as well as a pragmatic and active foreign policy.

The development strategy defines the further digitization of a number of important areas, such as public and social services, law enforcement, traffic management and health systems, banking and agricultural sectors, education and others.

In addition, the improvement of the electronic Government of Uzbekistan and the introduction of the share of electronic public services to one hundred percent, the introduction of the mobile ID system for identifying the person in their provision, the projects "Digital Citizen Passport" and "Digital Authority" are envisaged.

The E-Government Project Management Center is working together with the Ministry of Information Technology and Communications on the implementation of the "Digital Citizen Passport" project.

As an experiment from July 15, 2022 to December 1, 2023, government agencies, banks and other organizations do not need paper ID cards. In the future, instead, you will be able to present your digital versions in a special OneID Mobile application, which legally correspond to their physical counterparts.

At the first stage of the project, it is planned to introduce the system into the following areas:

- verification of documents for the right to use and manage vehicles;
- domestic flight;
- traveling by rail within the country;
- registration of guests in hotels, sanatoriums, rest homes and similar institutions;
- receiving services from mobile operators and Internet service providers;
- provision of public services in public service centers;
- provision of services for commercial banks and insurance companies;
- receive medical services;
- providing access for students in higher education systems.

In addition to the passport or ID card of a citizen of the Republic of Uzbekistan, users of the service can manage digital documents such as driver's license, vehicle registration certificate, marriage and birth certificate, student ID card, etc.

The service also provides the ability to share digital copies, send a passport to a trusted person for a certain time, and share the document data with service providers and much more.

II. Proposed Methodology

Information resources of higher education institutions are becoming an important element of information provision. The priorities in this area are as follows:

- Modernization of technical learning tools.
- Development of advanced teaching methods and learning methods.
- Creation of conditions for the implementation of the system of open education.

In addition, each educational information source has a specific owner who, based on his "implicit" goals, which include the following points, spends money on his education and support:

- The need to implement a certain educational policy in accordance with modern social and cultural requirements.
- The opportunity to expand international cooperation in the promotion of cybernetic education.
- The possibility of launching certain educational products on the market, which are realized by expanding the range of potential users and the formation of the needs of the target audience of students.
- Opportunity to expand the range of paid educational services.

A. Erstellen Eines Virtuellen Stands.

The virtualization of the teaching and laboratory complex of universities is an important issue. And the next steps involve the creation of a library of modules, nodes and devices, which are generally a software product. The

development of this type of resources intended for the learning process should include electronic texts of teaching aids, electronic images of graphic objects and a digital representation of audible information intended for listening [8].

The software, which was developed for the formation of virtual booths, is used everywhere in practice in the discipline "Computer science and information technology" and in other specialties of science and production, from technical project planning to organizational consulting [9-12].

The analysis of existing laboratory equipment and public software made it possible to determine the possibilities of the most efficient organization of the technical and methodological supply of laboratory lessons and the development of virtual laboratory stands using new pedagogical technologies in the organization of the learning process.

Modern pedagogical technologies involve the use of a set of measures for the formation of a virtual learning environment. Interactive technologies are a set of technical and software solutions aimed at achieving the pedagogical and cognitive goals of educational processes. Software means replacing people's activities with computers, hardware and software. This means that when automating workplaces, it is necessary to clarify from employees what degree of automation it is [13].

According to the degree of automation, learning technologies are divided into the following types:

- Learning technologies that are not automated.
- Learning technologies that are partially automated.
- Fully automated learning technologies.

The automation of pedagogical technologies involves the provision of the following possibilities:

- Exchange of teachers' activities (presentation of teaching materials, handouts, animation materials, control for adjusting the learning process, assessment of knowledge according to the assessment system).
- Provision of educational material (content).
- Implementation of types of learning activities (lectures, laboratory work, practical work, tests).
- Provision of teaching aids.
- Provision of training methods (detailed instructions on the use of methods, tools and methods of learning).

B. Automation of Pedagogical Technologies.

The automation of pedagogical technologies involves the provision of the following possibilities:

- Exchange of teachers' activities (presentation of teaching materials, handouts, animation materials, control for adjusting the learning process, assessment of knowledge according to the assessment system).
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- Provision of training methods (detailed instructions on the use of methods, tools and methods of learning).

Some didactic requirements must be imposed on automated pedagogical technologies, namely, the presence of operational feedback, virtuality, interactivity, visibility and scope of content. Information technologies should be considered as an effective means of acquiring learning material. Almost everything is determined by the quality of the organization of the cognitive process, the main element of which can be considered goal setting. The main task of pedagogical technologies is to define clear learning goals. A visual modeling system can be used as a tool environment. The possibility of further changes and extensions of the library (virtual laboratories, training programs and self-tests) should also be considered.

III. Results of Research

At the National Research University "TIIIMSH" at the Department of Automation and Process Control there is a bachelor's degree in Information Systems and Technologies. According to the curriculum of this direction, in the second year students take the discipline "Theory of information processes and systems".

At the Department of Automation and Control of Technological Processes, together with teachers of the Tashkent Pedagogical University named after Nizami, a set of virtual stands has been developed to perform practical work on the module "Theory of automata" of this discipline.

Consider one of these virtual stands - "Minimizing fully defined automata. Minimizing automatic Miles."

The development of the modules of this virtual stand is based on the π-partitioning method.

Consider the steps of this method.

1. In the transition/exit table, column groups with the same output response are highlighted (in the following example, the group columns are marked with *,+). The states corresponding to the equally marked columns form an equivalence class. The resulting equivalence classes form the initial division of class π_1.

2. For further partitioning attempts, the original table is rewritten. The states are grouped by belonging to the equivalence class. The contents of the cells are now the equivalence classes found that correspond to the states located there. For this, the source table is analyzed. For example, in the column for status 1, the following is written: A_2 A_1, since 3 has reached the status to class A2, and 5 has reached the status to class A_1.

3. In the resulting table, an attempt is made to map the corresponding classes again. The assignment of new classes is also determined by comparing the column contents within the same class. The new equivalence classes found form a division of class π_2.

4. The group changes 1 and 2 are compared, if they are the same, i.e. the same composition of the equality classes, the group change is considered complete, otherwise the attempts to create a new group change will continue .

5. When the partitioning is complete, a minimized automata table is created. From each class of the last partitioning, Ci is selected according to a state and they are redefined in Si terms. These states form a new automaton, the column of input letters is rewritten, status columns are added, based on the number of Si states obtained.

The cells of the new table are filled in as follows: the next Si state is taken, it is determined which states of the original table are equivalent to it. The output reactions contained in the corresponding columns of the original table are recorded in the new table. To record states, it is analyzed which equivalence class belongs to the state recorded in the corresponding cell of the source table. Then, which new state corresponds to the same equivalence class and it is written to the new table in the corresponding cell.

The created virtual booth consists of the following windows:

- the cover page of the virtual stand,
- the main window of the virtual booth, in which the following buttons are located,
- a button to open the interactive tutorial window,
- a button to go to the window of theoretical materials (the algorithm of the pi-partitioning method),
- a button to go to the examples window.

Let's look at the first window of the interactive training program.

1. In the interactive tutorial window, the user is asked to minimize the automaton specified by the combined table of transitions/outputs.

Fig 1. The 1st stage of automata minimization. Definition of equivalent states.

When you click the button to go to the next window, we see a table in which the states for which homogeneous equivalence classes have been introduced have already been grouped using the program (Fig.1). The transition/exit table highlights groups of columns that have the same output response. The states corresponding to identically labeled columns constitute one equivalence class. The resulting equivalence classes make up the initial partition π_1. The user must fill in the cells of the bottom row of the table himself, comparing the output reactions of Y_i.

If the user incorrectly fills in the last row of the table, the program displays an error message. If the table is filled in correctly, the user goes to the next window, otherwise he is given the opportunity to correct the error.

2. The next window shows the 2nd stage of solving the problem.

Classes A_1 and A_2 are analyzed for their splitting when submitting words of length 2: |p|=2. Using the pi-partitioning method, new groups are defined - B_1, B_2, B_3.

At this stage, also, if the user incorrectly fills in the last row of the table, the program issues an error message. If the table is filled in correctly, the user goes to the next window, otherwise he is given the opportunity to correct the error (fig.2).

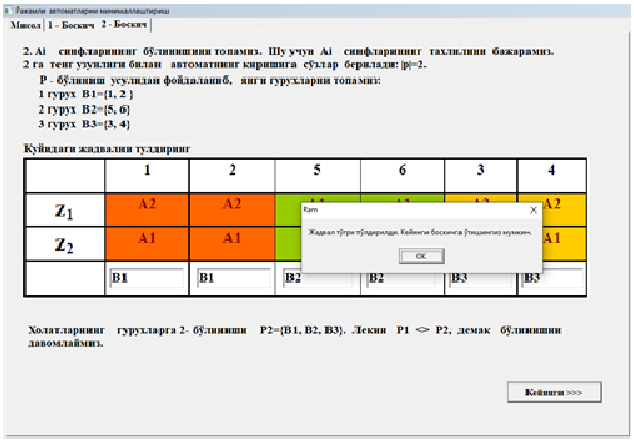

Fig 2. The 2nd stage of solving the problem of minimizing automata. definition of equivalence classes B_i.

At the 3rd stage of solving the problem, the Bi classes are divided.

To do this, B_i classes are analyzed.

Classes B_1, B_2 and B_3 are analyzed for their splitting when submitting words of length 3: |p|=3. Using the π-partitioning method, the user defines new groups - C_1, C_2, C_3. At this stage of solving the problem, $\pi_1=\pi_2$, therefore, the partitioning is considered completed.

If the 3rd stage of the task is solved correctly, the transition to the next window is performed. From each class of the last C_i partition, the user selects one state, and they are denoted in terms of S_i. These states will make up a new automaton, columns of states are added, according to the number of S_i states received.

At the last, 6th stage of solving the problem, the program outputs the original graph of the Mile automaton and the graph of the minimized Mile automaton (Fig.3).

As a verification of the correctness of the minimization, the combination X_1 X_2 X_2 X_1 is applied to the input.

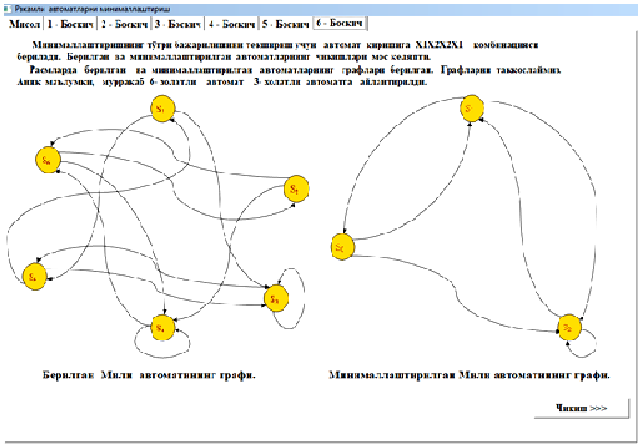

Fig 3. The window of the 6th stage of solving the problem. Graphs of the original and minimized Mile automaton.

The output reactions in the initial and minimized automata coincide. Thus, the student user is given the opportunity to independently solve the problem of minimizing the automaton.

IV. Conclusions

The development of the IT sector and the digital economy in Uzbekistan is among the main tasks. Due attention is also paid to the improvement of the sphere producing high-tech goods and services. In addition, in conditions of fierce competition in world markets, information and communication technologies can safely act as a locomotive for further sustainable development and diversification of the national economy, increasing its competitiveness [14-17].

The range of tasks of each educational institution should be determined by the social order of society. In the presence of market relations, the problems of economic and social integration are particularly acute. But the needs of information and communication technologies cannot always be met due to a lack of practical skills.

In a virtual classroom, teachers can more easily approach each student and individually involve them in classes in a virtual classroom according to their needs. Because in e-learning, teachers use new technologies to facilitate communication and expand learning opportunities. Students will actively participate in the learning process, and thus knowledge gaps will be prevented. The lecturer - teacher can directly share his on-screen content with the group through screen sharing. Teachers and students can access, edit and comment on all materials. This stimulates discussions and makes it easy to inform all students.

Another advantage of the virtual classroom is that it allows both students and teachers to attend online courses from anywhere.

A virtual classroom creates a learning environment in which everyone participates in learning at the same time. Compared to traditional learning methods such as face-to-face learning, e-learning offers more convenience and tools. Using various graphical tools, you can perform interactive exercises and solve visual tasks.

In the modern and virtual working world, it is important to think "outside the box". With the transition to digital technologies, it has become possible to conduct virtual courses, retraining or further education in a virtual classroom. Don't forget – learning in a virtual classroom, by the way, strengthens your own digital skills, which are so important today. All these points make the virtual classroom very effective and demonstrate the advantages of a virtual classroom over a traditional one.

References

[1] A. Ameno, K. Sumi, T. Motomura and S. Ulfa, "The International Comparison of Learners' Knowledge and Awareness in Japanese Technology Education: A Comparative study of middle and high school students against Japan, Indonesia, China, and the United States of America," 2023 9th International Conference on Education and Technology (ICET), Malang, Indonesia, 2023, pp. 94-98, doi: 10.1109/ICET59790.2023.10435102. keywords: {Surveys;Education;Europe;Information and communication technology;Cultural differences;Programming profession;information technology knowledge;information technology awareness;international comparison;understanding of information technology education;Information and communication technologies (ICT)},

[2] V. Pasichnyk and N. Kunanets, "IT education and IT business in Ukraine: Responses to the modern challenges," 2015 Xth International Scientific and Technical Conference "Computer Sciences and Information Technologies" (CSIT), Lviv, Ukraine, 2015, pp. 48-51, doi: 10.1109/STC-CSIT.2015.7325428. keywords: {Companies;Industries;Training;Outsourcing;Information technology;IT industry;IT education;IT business},

[3] H. Nanang, H. T. Sukmana, Y. Durahman, V. Arifin, D. Khairani and S. U. Masruroh, "The Success of Higher Education Institutional Policy Is Determined by IT Leadership and IT Infrastructure," 2023 11th International Conference on Cyber and IT Service Management (CITSM), Makassar, Indonesia, 2023, pp. 1-5, doi: 10.1109/CITSM60085.2023.10455570. keywords: {Leadership;Adaptation models;Education;Decision making;Buildings;Organizations;Information technology;Higher Education Institutional;IT Infrastructure;IT Leadership;IS Success Model},

[4] O. Haitan, "Improving the Quality of IT Students Education: the Ukrainian Experience," 2022 12th International Conference on Advanced Computer Information Technologies (ACIT), Ruzomberok, Slovakia, 2022, pp. 597-600, doi: 10.1109/ACIT54803.2022.9913101. keywords: {Industries;Educational programs;Computational modeling;Education;Companies;Teamwork;Information technology;IT education;project;soft skills;team work;triple helix model;university and industry collaboration},

[5] K. Sumi and T. Kakeshita, "National servey of Japanese universities on computing education: Analysis of IT education for high school teacher license on IT," 2017 Twelfth International Conference on Digital Information Management (ICDIM), Fukuoka, Japan, 2017, pp. 92-97, doi: 10.1109/ICDIM.2017.8244669. keywords: {Education;Licenses;Organizations;Informatics;Standards organizations;Computing Education;Web-based Survey and Analysis;Teacher License Education;Quality Assurance in Education},

[6] A. E. Shukhman and I. D. Belonovskaya, "Work in progress: Approach to modeling and optimizing the content of IT education programs," 2015 IEEE Global Engineering Education Conference (EDUCON), Tallinn, Estonia, 2015, pp. 865-867, doi: 10.1109/EDUCON.2015.7096074. keywords: {Engineering education;Conferences;modeling of the education content;IT education;professional standards;professional competency system},

[7] J. Kozieł, A. Wac-Włodarczyk and M. Śniadkowski, "IT education at the faculty of electrotechnology: Quality analysis and evaluation," 2019 29th Annual Conference of the European Association for Education in

Electrical and Information Engineering (EAEEIE), Ruse, Bulgaria, 2019, pp. 1-4, doi: 10.1109/EAEEIE46886.2019.9000442. keywords: {education;programme of studies;IT education},

[8] I. O. Kotlyarova, I. A. Voloshina, K. N. Volchenkova and E. V. Batina, "On-line Education Resources for the Optimization of On-line Continuing Professional Education," 2020 International Conference Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS), Yaroslavl, Russia, 2020, pp. 588-592, doi: 10.1109/ITQMIS51053.2020.9322956. keywords: {Education;Organizations;Internet;Continuing education;Millennials;Optimization;Task analysis;online continuing professional development;online education resources;virtual education platforms;collaborative tools;online quiz makers},

[9] C. Tungpantong, P. Nilsook and P. Wannapiroon, "Confirmatory Factor Analysis of Enterprise Architecture for Higher Education Institutions," 2022 International Conference on Decision Aid Sciences and Applications (DASA), Chiangrai, Thailand, 2022, pp. 965-969, doi: 10.1109/DASA54658.2022.9764970. keywords: {Technological innovation;Quality assurance;Digital transformation;Education;Channel hot electron injection;Organizations;Database systems;enterprise architecture;higher education institutions;confirmatory factor analysis},

[10] S. Kode and K. V. Nori, "Enhancing IT Education: Education Technology for Teacher Training," 2016 International Conference on Learning and Teaching in Computing and Engineering (LaTICE), Mumbai, India, 2016, pp. 94-98, doi: 10.1109/LaTiCE.2016.4. keywords: {Training;Information services;Electronic publishing;Internet;Linux;Java;Teacher Training;IT Education;Education Technology;Learning by Doing;Open Educational Resources;Assessment;Online courses},

[11] C. -M. Chituc, "An Analysis of Technical Challenges for Education 4.0 and Digital Education Ecosystems," 2022 IEEE German Education Conference (GeCon), Berlin, Germany, 2022, pp. 1-5, doi: 10.1109/GeCon55699.2022.9942758. keywords: {Industries;Education;Ecosystems;Market research;Fourth Industrial Revolution;Information and communication technology;Security;Industry 4.0;Education 4.0;Technical Challenges;Digital Education Ecosystem},

[12] K. N. Volchenkova, Y. S. Seriapina and I. A. Voloshina, "On-line Continuing Education for the Development of Faculty Academic Mobility," 2020 International Conference Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS), Yaroslavl, Russia, 2020, pp. 628-632, doi: 10.1109/ITQMIS51053.2020.9322967. keywords: {Education;Continuing education;Information systems;Trajectory;Electronic learning;Training;Task analysis;online education;academic mobility;faculty;online education environment;online learning;intercultural communication},

[13] S. Ubaydullayeva, G. Tadjiyeva, D. Ubaydullayeva, N. Kadirova, Z. Gulyamova and D. Subanova, "The Specifics of the Organization of Independent Work of Students in the System of Secondary Vocational Education In Uzbekistan in the Context of the Transition to a Digital Economy," 2023 3rd International Conference on Technology Enhanced Learning in Higher Education (TELE), Lipetsk, Russian Federation, 2023, pp. 287-290, doi: 10.1109/TELE58910.2023.10184330.

[14] S. Ubaydullayeva, D. Ubaydullayeva, R. Gaziyeva, Z. Gulyamova, G. Tadjiyeva and N. Kadirova, "Model of Organizing Online Learning for Students in Agricultural Area," 2022 2nd International Conference on Technology Enhanced Learning in Higher Education (TELE), Lipetsk, Russian Federation, 2022, pp. 317-320, doi: 10.1109/TELE55498.2022.9800945.

[15] S. R. Ubaydullayeva, D. R. Kadirova and D. R. Ubaydullayeva, "Graph Modeling and Automated Control of Complex Irrigation Systems," 2020 International Russian Automation Conference (RusAutoCon), Sochi, Russia, 2020, pp. 464-469, doi: 10.1109/RusAutoCon49822.2020.9208076.

[16] S. R. Ubaydulayeva and A. M. Nigmatov, "Development of a Graph Model and Algorithm to Analyze the Dynamics of a Linear System with Delay," 2020 International Conference on Industrial Engineering, Applications and Manufacturing (ICIEAM), Sochi, Russia, 2020, pp. 1-6, doi: 10.1109/ICIEAM48468.2020.9111939.

[17] S. Ubaydullayeva, D. Ubaydullayeva, R. Gaziyeva, Z. Gulyamova, G. Tadjiyeva and N. Kadirova, "Model of Organizing Online Learning for Students in Agricultural Area," 2022 2nd International Conference on Technology Enhanced Learning in Higher Education (TELE), Lipetsk, Russian Federation, 2022, pp. 317-320, doi: 10.1109/TELE55498.2022.9800945.