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CRITERIA FOR ORGANIZING DUAL EDUCATION AT THE "ENTERPRISE - DEPARTMENT" LEVEL AT THE TRAINING OF ENGINEERING STAFF

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Abstract

In the article organization of dual education, which is considered a modern education system, at the level of "Batosh solar photoelectric plant of Karshi district - Department of alternative energy sources" in higher education, definition of the principles of dual education, dual education the purpose, tasks and methodological support of teaching are discussed.

Keywords: "enterprise - department", level, solar photoelectric plant, organization, principles, theory, practice.

Introduction

The President of the Republic of Uzbekistan held a video selector meeting on the issues of "Training of personnel in engineering fields and priorities for further improvement of the activities of higher education institutions" gave:

- Teaching and scientific-research processes in 36 technical universities will be completely changed on the basis of best practice, their branches will be gradually enlarged, a total of 20 universities will remain, and each region will have at least 1 technical university.
- On the basis of the "Network - enterprise - university" chain, an industrial partner will be assigned to each university and "Higher engineering schools" will be opened in 10 universities of the republic.

Chairs will be opened in the partner enterprises of all engineering universities, and dual education will be established.

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It is considered one of the most prestigious universities in the Republic of Uzbekistan The following activities are carried out at Tashkent State Technical University:

- Specializations that are not in demand in the labor market will be reduced at the university.
- will be transferred to a full dual education system, the number of subjects will be reduced by 30%.
- Student service functions of the dean's offices will be fully digitized. A "Registrar's office" will be established, like abroad.
- Education will be adapted to the programs of the Technical University of Dresden (Germany) and the University of Tsukuba (Japan).

One of the most important things to be done by the President of the Republic of Uzbekistan regarding the fulfillment of the above-mentioned important tasks and the further improvement of higher education and training of personnel in engineering fields is the opening of departments in partner enterprises of all engineering universities and the establishment of dual education in them. Also, in order to further develop the use of dual education in the Republic of Uzbekistan, by the decision of the Cabinet of Ministers of the Republic of Uzbekistan dated March 29, 2021 No. 163 "On measures for the organization of dual education in the professional education system", the Regulation on the procedure for the organization of dual education in the professional education system was approved. In addition, there are urgent issues such as the development of a national plan, a special program for the training of qualified engineers in the field of renewable energy sources in the Republic of Uzbekistan, and the creation of a new system for the training of engineers using a dual education system in higher and secondary special educational institutions for this field [1, 10-11].

As can be seen from the above, training of engineering personnel that fully meets the requirements of the time is one of the most urgent issues, and it is undoubtedly an urgent issue to solve them, to implement teaching and research processes based on advanced experience, as well as by using dual education, which is considered a modern form of education.

The problems that arise in the implementation of dual education were considered and it became clear that the form of dual education is not always suitable for implementation and does not work everywhere [11,15-16]. However, until today, the methods of dual education and the methodological

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bases and methodological principles of its organization have been little studied, and scientific researches in this regard have not been carried out enough. Opportunities for the participation of applicants and employers in the implementation of dual education , their involvement in self-assessment in the formation of competence development in the conditions of dual education have not been sufficiently studied, and these issues are considered urgent.

Today, on the basis of the relevant decisions of the President of the Republic of Uzbekistan, intensive work is being carried out to provide our country with "green energy" , especially in the Kashkadarya region. If we talk about the ongoing work on the continuous supply of "green energy" to the population and production industries in Kashkadarya region, the construction of a 2 MW solar photoelectric power station by "Poverprof-group" LLC (registered from Tashkent region) in the "Batosh" MFY area of Karshi district. is considered.

Also, the construction of the 500 MW solar photoelectric power station, which is being built on a vast area of nearly a thousand hectares, belonging to the "Guliston" neighborhood of the Nishan district of the Kashkadarya region, is in full swing. Installation of solar panels and equipment equal to 100 megawatts imported from China is being carried out step by step. When the plan is implemented, 42 million kWh of electricity will be supplied to the network as a result. Of course, this will create the basis for the future supply of your country with "green energy" and, most importantly, for the economy of available resources. In order to connect the electricity produced at the station to the unified energy system, the construction of 3 36-kilometer long 220 kV power transmission lines with the funds of "Uzbekistan MET" JSC has also been completed .

Almost in Kashkadarya a thousand per hectare near infinite in width a solar photoelectric plant is being built

As can be seen from the above, the organization of dual education and effective use of it in the preparation of highly qualified engineers for the continuous,

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efficient use of solar photoelectric power plants is an urgent issue. In the dual system of training - the theoretical part of education is organized in an educational institution, and the practical part is organized in workplaces [2,3,10].

Analysis of literature on the topic

Dual education system in Germany, China, USA, Korea, Denmark, France, Macedonia, Montenegro, Switzerland, Netherlands, Denmark, Austria, Serbia, Slovenia, Macedonia, Montenegro, Switzerland, Netherlands and some Asian countries, i.e. from 60 is widely used in more than 100 countries and it is one of the modern teaching and learning technologies and is considered the main system of training, in which the integration of the educational process and practice serves as the basis for the high-quality training of qualified specialists in various fields of production enterprises [4].

As for the name "dual", dualism (Lat. dualis - two sides) is a concept that advocates the coexistence of irreconcilable states, principles, ways of thinking, worldviews, aspirations, and epistemological principles. doctrine. Dualism is a form of pluralism. The term dualism was introduced by the German philosopher H. Wolff (1679-1754). Dualism represents the following pair of concepts: the world of ideas and the real world. Dualism can be manifested in philosophical, religious, anthropological, ethical forms [5].

L.V.Sidakova recognizes that the dual education system is "an educational system that involves the combination of educational activities of an educational institution with the activities of production enterprises" [6]. The dual educational system of training specialists can be considered as "an educational system aimed at training specialists who will have the required level of qualification in a specific profession, clearly coordinated between the employers and production enterprises of higher professional education [7,8]. Also, in a deeper analysis of domestic and foreign literature, it is possible to imagine the dual education system as an educational model in which theoretical training can be carried out in educational institutions, and practical training can be carried out in production enterprises [7-10].

One of the problems of higher education institutions in training engineers is the existence of gaps between theoretical training and practical skills of students in higher education institutions, employers and the labor market. In recent years, in order to further improve the higher education system in the Republic of

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Uzbekistan, measures are being taken to gradually reduce this gap by introducing adapted state educational standards and professional standards, taking into account the future work functions of higher education graduates. Implementation of such a model of education in the training of future specialists of any profession will be possible using the dual education system [10-16].

Research Methodology

In order to successfully implement dual education in the higher education system, it is proposed to develop a dual education model based on cooperation between participants in the educational process [8].

The main elements of this model are:

- *legal components;*
- *conceptual components;*
- *dual education implementation program for higher education organizations;*
- *personnel component.*

Each of the proposed elements mutually acknowledges the other. In this, the conceptual component is represented by the activity of technological, methodological, personal-resultative levels, mechanisms and several conditions of the student's motivation for teaching.

The goals of introducing the "dual education model" are as follows:

- to improve the model of engineering personnel training, taking into account the real needs of the economy for qualified personnel, in order to increase the investment attractiveness of the regions;
- development of professional standards for business and related engineering professions and development and modernization of educational programs in accordance with the requirements of professional standards;
- to change the mandatory requirements for the organization and content of educational programs, to develop a mechanism for independent evaluation of the qualifications of engineers, and to optimize taxation in order to attract enterprises to finance the training of engineers.

The tasks of organizing dual education are as follows:

- interlinking educational processes of educational institutions with production conditions in the enterprise;
- organizing the practical part of education related to production in enterprises and the theoretical and educational-practical part in educational institutions by turning students into participants of labor activity;

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- to increase the investment attractiveness of the regions and to improve the training of engineers taking into account the real needs of the economy, to develop the conditions and models of mutual cooperation of enterprises and educational institutions, to form competencies by implementing educational programs in harmony with labor activities;
- to improve educational programs based on the requirements of employers and their technological updates, to finance the training of engineering personnel and the implementation of educational programs , to improve the forms and methods of mutual network cooperation between enterprises and educational institutions, to further expand the participation of enterprises in the evaluation of graduates.

It is known that a number of problems related to dual education arise when building a dual education system at several structural levels, such as "enterprise-university", "enterprise-department", "enterprise-laboratory". The right one is selected depending on the goal.

There are several features of the organization of the dual education system, and based on the analysis of the most important (10) features of the organization of dual education at the "enterprise-department" level, several of its principles and advantages have been identified (Fig.1).

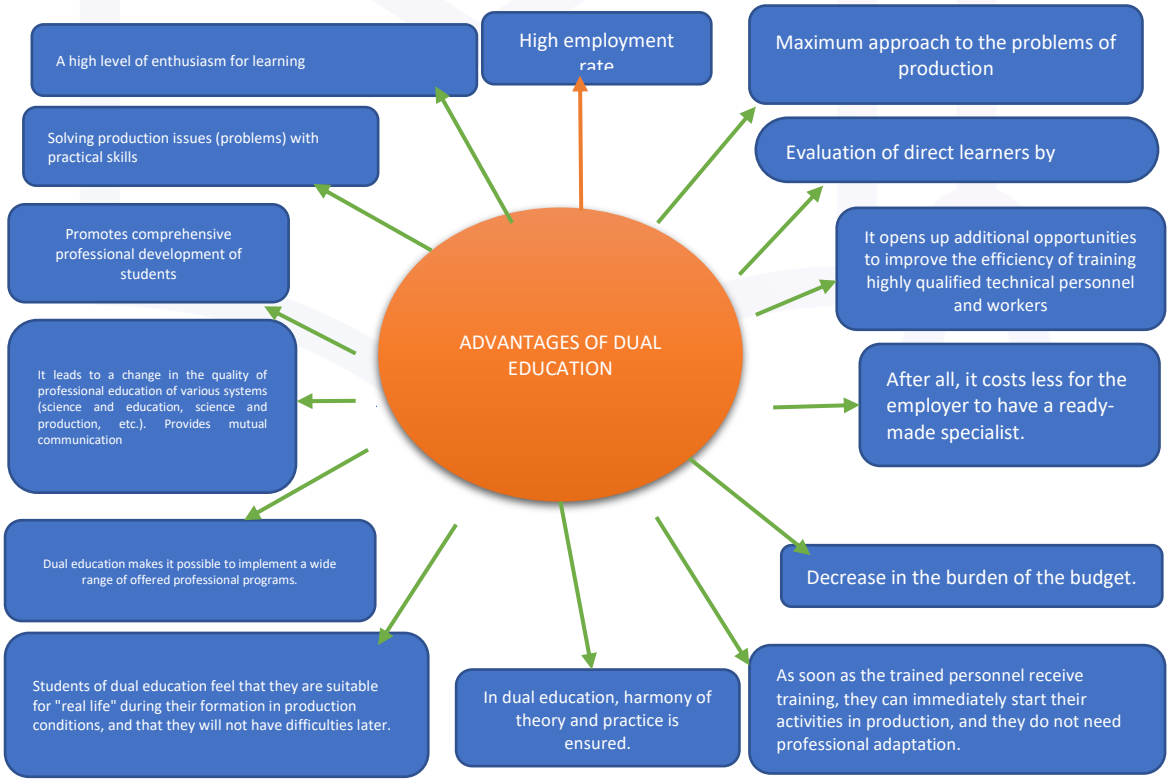

Figure 1. Advantages of dual education.

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The selection of eight (8) criteria of dual education is very important according to the results of the comparison (Table 1).

Comparison of the characteristics of dual and traditional education systems

Table 1

No	Dual education system	Traditional education system
1	The structure, content and volume of training of specialists correspond to the real needs of the enterprise	It is indicated that the structure, content and volume of specialist training comply with the normative documents of the standard of education
2	The practice is carried out directly on modern production equipment	The probability of practice in modern production equipment is about 10%
3	Laboratory, course work and graduation thesis topics are directed to the potential needs of the employing companies	Laboratory, course work and final qualification work topics reflect the specifics of production
4	Each auditorium has modern built-in analogues of production equipment (real models, samples).	Analogues of modern equipment are not available in all educational institutions
5	A precise list of specialists in high demand in the regional labor market is monitored	There is no monitoring of required specializations
6	Students get to know the corporate culture of the enterprise and work as a team	In short-term practice, students cannot get acquainted with the customs and traditions of the enterprise
7	The state is responsible for the theoretical part, the vocational training center, the enterprise is responsible for the practical part, or they are jointly responsible.	Educational institutions are responsible for theoretical and practical training
8	Students are provided with a scholarship by the enterprise	Preparation is done at the expense of the state or the student himself.
9	Practical work is carried out under the guidance of the mentor of the enterprise	Teaching is conducted by a teacher.
10	There is an opportunity to improve the qualifications of teachers in special subjects at the enterprise.	Practitioners are recruited to conduct practical training.

A comparative analysis of the differences between dual and traditional education systems shows that it is appropriate to take into account the selection of 8 points in the table, i.e. points (1-4, 6-7, 9-10) for the organization and introduction of dual education at the "enterprise-department" level and Figure 2 presents the 8 criteria.

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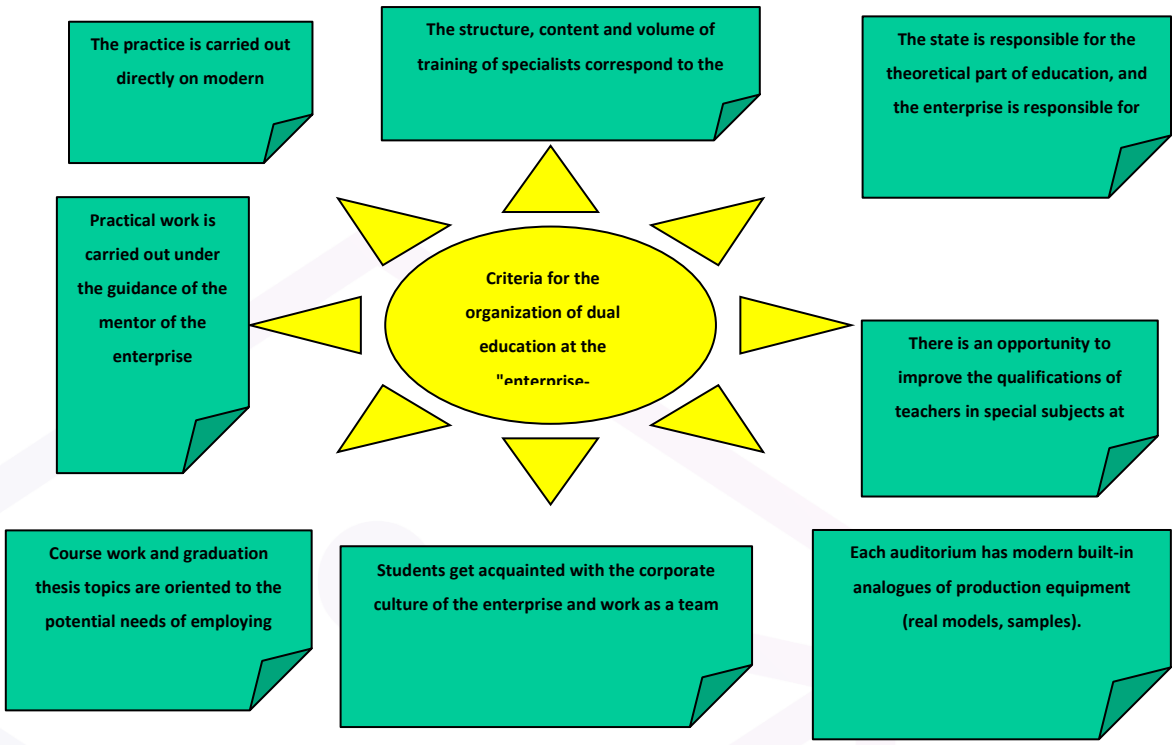

Fig. 2. Criteria for the organization of dual education at the "enterprise-department" level.

In the process of introducing the dual education system to higher education institutions, a number of problems are encountered. The first of the main difficulties is the insufficient level of preparation of the enterprise for training in personnel training, namely the lack of training places in the enterprises; the need to increase the price for the manufactured product, lack of funds for education in order to attract to education; (lack of equipment, inadequate funding, etc.).

Results

Taking into account the above difficulties, choosing the indicated eight (8) criteria, using dual education in the higher education system, "KARSHI DISTRICT" regarding the organization of dual education of qualified engineering personnel at the "enterprise-department" level BATOSH "KUYOSH PHOTOELECTRICAL STATION" enterprise Work is underway on a plan to introduce a dual education system between the "Alternative Energy Sources" department of the Karshi Engineering and Economics Institute.

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Dual education system is a form of network based on mutual cooperation between employing enterprises and educational institution of Karshi Engineering and Economics Institute, i.e. network form based on coordinated mutual cooperation of "BATOSH SOLAR POWER STATION OF KARSHI DISTRICT" enterprise is meant to be.

Dual education includes a combination of theoretical and practical training, in which the student must master the basics of professional activity (theoretical part) at the Department of "Alternative Energy Sources" of the Karshi Engineering and Economics Institute, which is considered a higher education institution, and training and the practical part of the project is carried out in the enterprise "BATOSH" SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT, which is considered a direct workplace.

"BATOSH SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT", where professors and teachers of the "Alternative Energy Sources" department of the Karshi Engineering and Economics Institute, have specific jobs, include three main components:

1) educational, production (pedagogical) practice;

2) practical and laboratory training;

3) activities outside the auditorium (excursions, roundtable discussions, master classes).

Purpose: To increase the competitiveness of graduates with the quality of qualifications required in the modern economy, and to create a system of training qualified personnel that meets the needs of employers in terms of the number of graduates.

Tasks: 1) prepare graduates with high qualification level expected by employers; 2) increasing the investment attractiveness of the region; 3) attracting investments to the educational system of higher education institutions.

Participants: "BATOSH" SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT" enterprise, students of the institute, professors and teachers.

Documents: According to the decision of the Cabinet of Ministers of the Republic of Uzbekistan dated March 29, 2021 No. 163 "On measures for the organization of dual education in the system of professional education", the procedure for the organization of dual education in the system of professional education is correct. Regulation on

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"BATOSH" SOLAR PHOTOELECTRIC STATION OF KARSHI DISTRICT" enterprise The preparation for the plan to introduce a dual education system between the "Alternative Energy Sources" department of the Karshi Engineering and Economics Institute will consist of two stages:

The first stage - the following regulatory, educational and methodological documents are developed on the dual education system of preparation for dual education at the "Alternative energy sources" department of the Karshi Engineering and Economics Institute:

- Karshi Engineering and Economics Institute and the enterprise "BATOSH" SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT" agreements on providing students with dual education; conducting some types of dual education at the educational institution was additionally determined;
- Dual educational programs on the specialty "Alternative energy sources" will be developed, the programs will be developed by the enterprise "BATOSH" SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT" prepared in coordination with;

enterprise "BATOSH" SOLAR PHOTOELECTRIC STATION OF KARSHI DISTRICT" by specialty a curriculum is developed in agreement with;

- dual education plans and schedules are agreed with the base educational institution;
- a plan of measures to ensure the educational process will be drawn up within the framework of the introduction of dual education;
- The Regulation "On the organization and conduct of dual education in production enterprises" is prepared and approved;
- contracts on dual education are developed and preparations are made for concluding contracts with students.
- the second stage - the stage of implementation of dual education programs, dual training of 3rd-4th year students is carried out based on the approved schedules, practical training is carried out directly and in different ways at the employer's company. is done by:

– practice within the framework of dual education elements is organized according to professional modules, after completion of practice types, differential tests are conducted;

- protection of practice results becomes an integral part of the (qualification) examination , participation of social partners in the (qualification) examinations held for the studied modules, participation in the assessment of the quality of

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the training of specialists by participating in the state final attestation with the awarding of qualifications in the specialty will have the opportunity.

In the process of science integration professors and teachers will also have the opportunity to practice in the enterprises of social partners, as well as participate in master classes, seminars, various competitions, as a result of which they will increase their qualification level and learn about the technological possibilities of new modern equipment and they will be able to occupy them.

Discussion

1. Forming, improving the principles of the unique features of dual education and implementing it at the "enterprise - department" level, i.e. "BATOSH SOLAR PHOTOELECTRICAL STATION OF KARSHI DISTRICT" enterprise - Department of "Alternative Energy Sources" of Karshi Engineering and Economics Institute it is appropriate to introduce a dual education system between A more successful formation of the educational process allows to rationally organize the cognitive activity of students (teaching theoretical and practical exercises).

2. Taking into account the needs of the enterprise, it became clear that there is a need to revise the contents of the training of students on the basis of the professional module, including the teaching materials. It was found that the methodology and software were not sufficient for the rational organization of the dual education process in the "enterprise-department" partnership, and based on the students' practical skills and acquired knowledge, the software for teaching in dual education conditions was developed.

3. Increases the professional mobility of graduates and their competitiveness in the labor market; the relations between the activities of higher educational institutions and production enterprises will be strengthened. Due to the application of the dual education system to the educational process, it will be possible to combine the interests of business - youth - the state and bring the tripartite partnership relations to a completely new stage is achieved and the use of dual education further strengthens the mechanisms of development of social spheres in higher education;

4. Dual education is considered to be an effective way to increase the quality of education, and by influencing the balance of demand and supply of labor force, it is necessary to implement a mechanism of mutual cooperation between educational institutions and enterprises to increase the quality of personnel

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training. help improve graduate employment and employability and human resource development.

5. The mechanism of dual education helps to develop the graduate's professional competencies, to form an active life position and to form a responsible person who is able to work effectively.

Conclusions

1. It is necessary to involve the production teachers of the enterprise as teachers to teach separate departments of subjects (if necessary, to conduct educational seminars and trainings for them on dual education).

2. On the basis of methodological and methodical principles of mutual cooperation between the department and the enterprise, organizational and management problems should be solved by mutual agreement. Subjects of the course work and the final qualification thesis should be directed to the potential needs of the employing enterprises.

3. In order to develop the successful formation of professional competences of future engineers, it is important to implement the principles of organizing dual education, and further improvement of teaching methods based on dual education should be done more scientific research.

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