

PROCEDURES FOR DEVELOPING AND IMPLEMENTING A “DUAL EDUCATION DIARY” FOR THEIR PRACTICE IN ENTERPRISES WHEN TRAINING ENGINEERS ON THE BASIS OF DUAL EDUCATION

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ABSTRACT

The article describes the development of a “Dual Education Diary” for the training of engineers on the basis of dual education for their internships at enterprises and the procedures for maintaining it. The procedure for its development each year for educational, production and pre-diploma internships, and its components. It is considered that the Dual Education Diary will help students studying on the basis of dual education to clarify the content of the topics of training sessions held at the enterprise, intensify the educational process, optimize the study periods, and make a significant contribution to the better development of students' personal educational trajectories and professional competencies. Teachers must regularly monitor the detailed recording of the quality of work performed by all students during the internship in the dual education diary, including their grades, work discipline, and competencies developed under the program. After the completion of the training process at the enterprise, teachers review the student's performance during the internship and, based on their recommendations, the student is given a production description. It was determined that the achievements, practical skills and professional competencies of students are recorded in the dual education diary, and on this basis, the dual education diary serves as one of the main documents for issuing production descriptions to students. It was also reported that the developed dual education diary allows students to record information about their internships, laboratory and practical training and other types of work in the dual education diary, and that systematically filling out the dual education diary allows students to pass intermediate control tests and take the final exam. It was reported that the dual education diary is an educational and normative document that reflects the content of the established curriculum when organizing the educational process in enterprises and organizations according to the schedule of the educational process.

Keywords: Enterprise, dual education diary, internship, description, mentors, learning process.

INTRODUCTION

As a result of the reforms being carried out in the Republic of Uzbekistan, significant changes are being made in the higher education system. In particular, at the videoconference meeting of the President of the Republic of Uzbekistan on 20.06.2024 on “Priority tasks for the training of personnel in the engineering fields and further improvement of the activities of higher educational institutions”, the following main tasks were identified, including:

- All engineering universities will open departments at partner enterprises and dual education will be established.
- Students' internships and graduation courses are fully organized at partner enterprises, etc.

Also, in order to further develop the application of dual education in the Republic of Uzbekistan, the Regulation on the procedure for organizing dual education in the professional education system was approved by the Resolution of the Cabinet of Ministers of the Republic

of Uzbekistan No. 163 dated March 29, 2021 “On measures to organize dual education in the professional education system”[1].

It is known that the problems arising in the implementation of dual education in the higher education system have been considered, and it has become clear that the form of dual education is not always and everywhere suitable for implementation and does not work [2-8,]. In the dual system of training in engineering personnel, the theoretical part of education is organized in an educational institution, and the practical part is organized in the workplace [3,4,5].

LITERATURE REVIEW

The dual education system is widely used in Germany, China, the USA, Korea, Denmark, France, Macedonia, Montenegro, Switzerland, the Netherlands, Denmark, Austria, Serbia, Slovenia, Macedonia, Montenegro, Switzerland, the Netherlands and some Asian countries, that is, in more than 60 countries, and it is one of the modern educational technologies and is considered the main system of education, 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 [4,5-9].

One of the problems of higher education institutions (HEIs) in the training of engineering personnel is the existence of gaps between the theoretical training and practical skills of students in higher education institutions, employers and the labor market. In recent years, measures have been taken to further improve the higher education system in the Republic of Uzbekistan, aimed at gradually reducing this gap by introducing state educational standards and professional standards adapted to the future job functions of higher education graduates. The implementation of such a model of education in the training of future specialists of any profession is possible using the dual education system [2,4,10-16].

METHODOLOGY

At the current stage of professional training of future engineering specialists, great attention is paid to the unity of theoretical training and its practical application. In the training of qualified engineering personnel using dual education in the higher education system, the dual education system provides an opportunity for professional self-realization and allows for comprehensive, high-quality training of future engineering specialists.

Practice, economic interests, and the country's rapid development paths should determine the goals, methods, and content of higher and professional education. Currently, the dual system of education is one of the most effective forms of training professional and engineering technical personnel in the world, where theoretical and production/practical training are carried out simultaneously [5-8].

The "Dual Learning Diary (DLK)" was developed to provide normative and methodological support for the practices of students studying in the dual education system in the higher education system, to clarify the content of the training topics held at the enterprise, to intensify the learning process, optimize study periods, and to create personal educational trajectories for students.

We can provide the following general information and rules for conducting a DED:

1. As is known, an agreement is concluded between a higher education institution and a manufacturing enterprise on conducting educational processes at a manufacturing enterprise for the training of qualified engineering personnel on the basis of dual education. Based on the concluded agreement, programs for training students on the basis of dual education are jointly

developed, and in accordance with the training programs, a “Dual Education Diary” is developed for each academic year in cooperation with the manufacturing enterprise and professors and teachers of the higher education institution and is duly formalized. A dual education diary is an educational and normative document that reflects the content of the curriculum established for organizing the educational process in enterprises and organizations according to the schedule of the educational process.

2. The developed DED records information about the production practice, laboratory and practical training and other types of work of students under dual education training programs at production enterprises. Systematic completion of the DED is one of the important conditions for students to pass intermediate control work and take the final exam.

3. On the last page of the dual education diary of all students participating in the internship, all types of dual education (in each semester) and the implementation of the plan-graphic calendar schedule of training based on dual education are signed by the person responsible for implementing dual education at this enterprise and confirmed by the seal of the enterprise.

4. The appendix to the DED should contain a brief text of the instructions on safety and fire safety at the workplace of the production enterprise, which must be explained to each student by the teachers. The DED is a reporting document for each course of study of all the work performed by the student at the production enterprise and is filled out in accordance with the instructions for keeping a diary, which is part of the diary.

5. The student's DED is a primary document for recording the practical tasks, laboratory and practical training carried out in the dual education program at the production enterprise, as well as the level of mastering part of the theoretical course, and it can be submitted to the enterprise if necessary for training on the basis of dual education. The DED is compiled separately for each academic year and is stored in the archives of the higher educational institution for at least 3 years from the date of graduation of the student.

The DED is drawn up on the basis of agreements concluded between the enterprise and the higher education institution on the implementation of dual education, between the student and the enterprise. The DED is developed for each student in the group and approved by the head of the higher education institution and the head of the enterprise. The DED is developed and approved in cooperation with the teachers attached to the higher education institution and the enterprise, based on the curriculum, using the technological processes of the enterprise and modern equipment, devices and devices used, as well as their technological instructions.

After the DED is approved, it is given to students 3 days before the start of studies according to the schedule of the educational process. When maintaining the DED, each student responsibly records the content of the daily work performed according to the program. In addition, students also record additional daily work performed at the enterprise. After recording the work performed by the student in the diary, in order to determine the mastery indicators, they are evaluated using the assessment criteria established by the university and the enterprise's assigned teachers. The university and enterprise's assigned teachers monitor the systematic filling out of the DED by students every day and sign them.

After completing the training process at the enterprise, each student is given a production description based on the recommendation of the assigned mentors from the enterprise. The quality of the work performed by all students at the enterprises during the internship, their grades, labor discipline, and the competencies formed according to the program are recorded in detail in the DED. If the student's internship is organized at several enterprises, the production description is obtained from each enterprise.

Before taking the State Attestation and Final State Attestation exams for qualification, students submit a fully formalized DED log and production description to the assigned teacher from the higher education institution, and this log is stored in the higher education institution's archive for at least 3 years. The criteria for evaluating students under the dual education program are determined by the educational institution in agreement with enterprises and organizations, taking into account the content of the educational programs and the competencies being mastered.

RESULTS

The main tasks of the developed DED are: to clarify the content of the topics of training sessions held at the enterprise; to distribute training hours by types and topics of training; to determine the assessment of the learning outcomes of training and production practice; to determine the formation of skills in the student based on knowledge in the process of training and production practice; to determine the places of training sessions (topics); to determine the period of training sessions (topics).

The requirements and conditions of the DED are as follows: the enterprise will not allow training sessions if the DED is not developed; the content of the DED must be consistent with and integrated with the requirements specified in the employer's qualification requirements; the student's knowledge and skills must be consistent with the competencies specified in the qualification requirements, and the results of mastering the educational programs; the sequence of implementation of the topics of the educational production practice must be covered; the general and professional competencies reflected in the qualification requirements of the educational production practice must be covered.

The procedure for developing and approving a dual education diary is as follows:

1. The dual education diary is developed by teachers assigned from universities and enterprises and approved in accordance with the established procedure.
2. The content of the DED and ensuring its implementation in the educational process are the responsibility of the compilers of the DED and the leader who approved the DED.
3. The DED is developed based on the total number of hours of specific training and production practice, divided into 1 and 2 semesters for each academic year.
4. The DED developed at the higher educational institution is discussed in the departments. The discussion takes into account the structure and content of the DED, its compliance with the working curriculum, the standard curriculum and mastery requirements, its integration with the employer's qualification requirements, and its compliance with this Instruction.
5. The DED, formalized in accordance with the requirements of the Instruction, is recommended and discussed by the Methodological Commission of the higher educational institution based on the minutes of the department meeting and is approved by the heads of the higher educational institution and the enterprise by the decision of the Methodological Commission for its implementation in the educational process.
6. When developing the DED, the following requirements must be observed: a). The daily text is prepared using a text editor; b) in Times New Roman font, kegl-14, single spacing; c). tables are in Times New Roman font, size 10; g). The page title is placed on the right side of the page at the bottom; v). The pages of the DED text must correspond to A4 format (210x297 mm); e). Headings are written in large and bold letters.

The DED mainly consists of the following parts: Part I. Title page of the DED. Part II. Information about the participants in the dual education process. Part III. Diary of educational, production and pre-diploma practice of dual education. Part IV. Production schedule.

Part I. The title page of the DED is considered, which indicates the educational, production and pre-diploma practice, and the following is written on the title page: - the student's surname, name, patronymic are written by hand in accordance with the passport data; - the name of the HEI is indicated; - the name of the enterprise where the practice is carried out is indicated; - the code and name of the specialty being mastered are written without full abbreviation; - the specified academic year, course and group name are indicated; - the student's signature is affixed; The date of approval of the DED developed by the HEI Methodological Council, the protocol number is indicated; - the place of work, position, signature of the employees of the HEI and the enterprise who are the compilers of the DED are indicated.

Part II. Information about the participants in the dual education process and the mentor assigned by the higher education institution is filled in one day in advance and the following is written in it: - name of the internship (educational, production and diploma); - name of the enterprise where the dual education is organized; - address of the enterprise; - period of training, for example: from “__” __ 20__ to “__” __ 20__ ; - surname, name, patronymic, place of work, position, phone number, date of completion of the mentors assigned from the higher education institution and the enterprise.

Part III. The diary of educational, production and pre-degree internships of dual education and internships conducted at production enterprises consists of a diary of educational, production and pre-degree internships and is developed separately for each type of internship.

The developed dual education training, production and pre-diploma practice diary mainly consists of the following: - name of the practice (training, production and pre-diploma); - practice period, for example: “__” __ 20__ to “__” __ 20__ years are indicated; - place of practice: (Section, department, etc.); - total hours of practice: __ hours; - hours participated in the practice: __ hours; - hours not participated in the practice: __ hours; surname, name, patronymic, signatures of the assigned teachers from the university and the enterprise. - structure of the dual education (training, production and pre-diploma) practice and it also consists of the following: a). name of the practice (training, production and pre-diploma); b). names of the competencies to be mastered: 1.2.3....; v). days of the week and dates; name of the topics to be mastered at the enterprise; hours; skills in the acquired competencies; grade; signatures of assigned mentors from the enterprise and higher education institution; g). The content and types of additional daily work performed at enterprises (in terms of educational, production and pre-diploma practice) are as follows: days of the week and date; name of daily work performed at the enterprise (filled in by the student); grade; signatures of assigned mentors from the enterprise and higher education institution.

Part IV. Production schedule, which includes the following: - the name of the university and the enterprise is indicated; - the student's last name, first name, patronymic; profession and specialty, course and group, internship period, date; - place of work at the enterprise (Sex, department, etc.); - the student performed the following work according to the program: 1,2,3,4,5,6... (jobs and main types of work performed must be listed by name); - quality and assessment of the work performed: (satisfactory, good and excellent); - labor discipline: (achievements and shortcomings are indicated); - the student formed the following components according to the program: 1.2.3.4.; - additional information; - signatures of teachers assigned from the enterprise and university; - signature, date and seal of the head of the enterprise.

The tasks of a mentor assigned from the enterprise are as follows: 1. A mentor assigned from the enterprise provides guidance in providing students with professional skills and knowledge, including monitoring the formation of competencies that students should acquire using educational programs in collaboration with university employees, and is responsible for

conducting the educational process at the enterprise.2. When selecting mentors, the enterprise management selects them based on their many years of work experience and pedagogical skills and is appointed by order of the head of the enterprise. It should also be taken into account that it is not advisable to assign a new employee to the enterprise as a mentor.3. A mentor assigned from the enterprise is assigned individually or in relation to a small group and also performs the following tasks:

- * To familiarize students with the activities of the enterprise;
- * To develop a positive attitude towards work among students and to teach them to work as a team as possible;
- * Adapting students' professional activities to the internal rules of the enterprise, labor discipline and internal environment;
- * Training their personal professional experience and knowledge;
- * Monitoring compliance with the enterprise's internal labor regulations, labor protection requirements, sanitary and other mandatory norms and rules and forming these skills in students;
- * Teaching students professional secrets in the formation of general and professional competencies;
- * Teaching students the most effective methods and techniques for performing assigned tasks;
- * Developing students' professional abilities; * Teaching to ensure the effective use of time and resources;
- * Providing students with all the resources and tools necessary for education (special clothing, equipment, materials, etc.) during the educational process;
- * Organizing and controlling the use of a workplace for students; * Educating students in the skills of using modern equipment, technological equipment and their instructions training;
- * Training in the effective use of equipment, materials, and other supplies;
- * Organize students' work fairly, teach students only tasks that correspond to the curriculum in the educational process according to the competencies they must master;
- * Check the performance of individual labor tasks and technological operations by students;
- * Teach the effective and targeted use of material resources and raw materials; * Monitor the work performed independently by students, identify and jointly eliminate errors;
- * Monitor student attendance and sign the daily assessment diary of their work; * Provide information from the educational institution to the assigned teacher about the results of students' mastering the curriculum, discipline and behavior;
- * At the end of the training sessions, write a production description of the assigned students on the quality of their work, labor discipline and formed competencies and submit it to the head of the enterprise;
- * Participate in the preparation of questions for the State Attestation Exams; * Participate students in the State Attestation Exams.

The main tasks of a teacher attached to a higher educational institution are as follows:

1. The teacher attached to a higher educational institution monitors the provision of professional knowledge and skills to students by enterprise teachers, the formation of competencies that students must acquire according to educational programs in cooperation with teachers attached to enterprises and organizations, and is responsible for conducting the dual education process at the enterprise.

2. To organize and supervise the dual education process organized at enterprises, an experienced and qualified professional pedagogue is selected by the management of the educational institution from among the professors and teachers and appointed by order of the head.

3. The teacher attached to a higher educational institution is assigned to a group or a small group.

4. The teacher attached to a higher educational institution strictly monitors the students' dual education diary and is responsible for filling out the group journal.

5. The teacher assigned from the university is personally responsible for the quality of students' education during practical training at the enterprise and also performs the following tasks:

- * Participate in the development of educational process schedules and other educational and normative documents in collaboration with enterprises and organizations;

- * Develop the DED, the schedule of student rotation in workshops and departments, and control work schedules;

- * Monitor the maintenance of each student's diary, daily assessment, signing and control;

- * Ensure order and discipline of students, give instructions on labor and fire safety and industrial sanitation and hygiene, analyze and eliminate factors that may pose a threat to the life and health of students;

- * Maintain order among students in the event of accidents at enterprises, ensure immediate first aid in case of injury, and inform the management of the higher educational institution about this;

- * Monitor the timely arrival and attendance of students at the enterprise;

- * Analyze the conduct of training for students, improve the training programs based on the requirements of the enterprise in cooperation with the teacher assigned from the enterprise;

- * Change and monitor the work of students according to the rotation schedule in the departments, taking into account the competencies that they must acquire according to the program; * Ensure and monitor the participation of students in spiritual and educational events organized at the enterprise;

- * Use pedagogically sound forms and methods of organizing practical training, apply modern educational technologies and technical means of teaching;

- * Monitor and evaluate the readiness of students to work, the work performed by them, assess the dynamics of student motivation, and determine the profession Identifying the causes of difficulties in learning, individualizing and adapting the educational and upbringing process;

- * Establishing pedagogically appropriate relationships with students, creating conditions for their education and development, encouraging them to acquire a profession, teaching them self-management and control;

- * Analyzing, coordinating and improving the educational process and relationships in the group;

- * Monitoring the timely provision of financial incentives to students by the enterprise;

- * Holding meetings with students' parents when necessary;

- * Providing information to the management of the educational institution every week on the educational process at the enterprise, its achievements and shortcomings;

- * Collecting and analyzing all diaries and production descriptions of the group's students at the end of their training sessions, having them signed by the head of the enterprise, and submitting them to the management of the higher education institution.

The main tasks of university students are as follows:

1. Arrive and leave the enterprises on time according to the established procedure.

2. Inform their teachers and obtain permission in case of absence from training sessions for certain reasons.

3. Receive specific instructions from their teachers before starting work and instructions for carrying out these instructions.

4. Observe order and discipline at the enterprise, work according to labor and fire safety techniques and sanitary and hygienic instructions.

5. Observe personal hygiene, keep personal belongings, workplace and area clean.

6. Use tools, equipment, materials and other equipment effectively.
7. Fulfill the tasks and tasks given by teachers sincerely and responsibly.
8. Not to perform life-threatening tasks without the permission of teachers.
9. Work on yourself, develop general and professional competencies.
10. Fully fulfill the independent learning tasks assigned by teachers.
11. Use the information resource centers of the enterprise.
12. Participate in spiritual, educational and sports events organized at the enterprise.
13. Write to the DTC on the daily work performed and have the teachers sign.
14. Responsible for keeping the diary clean and tidy and handing over the DTC to the assigned teacher from the university at the end of the training sessions.

The schedule of student rotation in workshops and departments of an enterprise where the dual education learning process is organized is developed taking into account the types of production and the complexity of technological processes at the enterprise. The schedule of student rotation in workshops and departments is a schedule of student rotation in workshops and departments of the enterprise in order for students to fully develop the competencies they must acquire according to the educational programs.

It is recommended to develop a student exchange schedule based on the requirements and proposals of the enterprise and in agreement with them. Because some enterprises may require students to work in only one workshop or department. In this case, based on the requirements set by the enterprise manager, students may not be able to fully master the curriculum by working in one workplace.

The structure of the student exchange schedule in workshops and departments at enterprises is as follows:

- name of the enterprise;
- name of the workshop and department;
- boiler shop (BSC);
- turbine shop (TC);
- central repair shop (MTC);
- student's last name, first name, patronymic;
- study weeks: 1,2,3,.....30;
- study load: 18 hours or up to 36 hours;
- 1st subgroup: BSC, TC, MTC;
- 2nd subgroup: BSC, TC, MTC;
- 3rd subgroup: BSC, TC, MTC.

When developing a student exchange schedule, it is important to note that students must complete one internship module related to the qualification during their training at the enterprise and then continue to master the next internship module in another workshop or department. In this case, students should not return to the workshop or department where they previously practiced for the second time. For example: According to the established student exchange schedule, subgroup 1 will practice in the boiler shop for weeks 1, 2, 3, and must master all the boiler maintenance topics in the program. At this time, students in subgroup 2 will master the turbine maintenance topics in the program in the turbine shop, and students in subgroup 3 will master the equipment repair topics in the central repair shop.

When drawing up a student exchange schedule, study weeks are entered and subtracted according to the educational process schedule in the curriculum. For example: if 1080 hours of

practical training organized at the enterprise are planned, then 30 weeks are planned for 36 hours per week, 60 weeks are planned for 18 hours per week, and 90 weeks are planned for 12 hours per week. After entering and subtracting study weeks, study loads are calculated. When calculating study loads, the complexity of the technological processes in the workshops where students are assigned and the duration of the products being produced are taken into account, and the study loads are distributed over one or more weeks. Therefore, the student exchange schedule is developed based on the requirements and proposals of the enterprise and in agreement with them.

Each student records the topics he/she is learning in the workshop where he/she is doing his/her internship in his/her own diary. In whichever workshop the student is doing his/her internship, he/she also records the topics from the curriculum for that workshop and additional assignments given by the teachers. In some small enterprises, a student rotation schedule in workshops and departments may not be necessary. Because in such enterprises, technological processes are carried out in one workshop.

CONCLUSIONS

1. DED ensures that the practices of students studying on the basis of dual education clarify the content of the training sessions held at the enterprise, intensify the learning process, optimize the training periods, and further develop the personal educational trajectories and professional competencies of students.

2. The DED serves as one of the main documents in which all students record in detail the quality, assessment, labor discipline, and competencies developed under the program of the work performed at the enterprises during the internship, and taking into account their effectiveness, each student is issued a production description based on the recommendations of their mentors upon completion of the educational process at the enterprise.

3. The developed DED allows students to record information about their internships, laboratory and practical training, and other types of work in the DED, and the systematic completion of the DED creates opportunities for students to pass midterm tests and take the final exam.

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