

## **FORMATION OF PROFESSIONAL COMPETENCIES OF HIGH-TECH INDUSTRY SPECIALISTS IN DUAL EDUCATION**

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### **ABSTRACT**

This article addresses issues such as the quality of professional education and training of graduates in the formation of professional competence of specialists in high technology in dual education, training of quality personnel through organizational and meaningful relations with educational institutions, the formation of professional competencies.

**Keywords:** Dual education, educational institution, employer, high-tech field, professional competence, specialist.

### **INTRODUCTION**

High-tech industries require competent specialists who are able to work with new technologies, new types of equipment, ready to constantly improve their professional level. Analysis of the quality of training of vocational education graduates showed that this training does not meet the requirements of high-tech industries due to the lack of professional competencies of students to perform relevant technical tasks related to the manufacture of high-precision products.

The main problems of the low quality training of specialists in the high-tech industry are the gap between the requirements of the labor market and the educational services provided by vocational education, which is manifested in the insufficient relationship of the educational process with production practice. In our opinion, the elimination of these gaps will be facilitated by organizational and substantive interaction between a professional educational organization and employers, which is effectively implemented in the context of dual education. According to the UNESCO International Standard Qualification, dual education is an organized educational process for the implementation of educational programs combining part-time work with training according to the traditional vocational education system. This education is based on the ideas of the relationship of theoretical training with practice, which takes into account the further development of enterprises and the industry as a whole, contributes to the active involvement of the future technician in applied research and the transformation of the educational process in vocational education.

### **Analysis of recent research and publications**

The theoretical justification of the organizational and pedagogical conditions for the effective formation of professional competencies of technicians in the high-tech industry is based on the qualifications of technicians defined by the state educational standard for vocational education, a unified tariff and qualification reference book, employers, and studies by R.Kh. Dzhuraev, Z.K. Ismailova, V .AT. Kraevsky, I.V. Kagan, N.A. Muslimova, N.F. Talyzina, A.R. Khodzhaboeva I.S. Yakimanskaya, considering the design of the content of vocational education based on the analysis of the tasks of the future professional activity of graduates [3;

4; 5; 6]; on the works of A.A. Verbitsky, defining the use in the content of the preparation of training professionally oriented tasks [2].

The analysis of the qualification characteristics of vocational education specialties and areas of demand for specialists in the innovative economy suggests that the professional activities of future technicians in the high-tech industry are directly related to high-tech, high-tech production (military-industrial complex), the characteristics of which today are: increasing technology integration, related with the introduction of automated systems in production, the complication of the relationship between the structural components of the production process and the increasing dependence on the qualifications of workers [3; 4; 7; 8;].

The target of the first organizational and pedagogical condition is reflected in the formation of design, technological and information components of professional competencies in the field of new technologies for working on high-tech equipment.

In turn, S.Ya. Batsyhev distinguishes between two types of tasks used in the study of general professional disciplines in educational organizations: “quantitative tasks associated with operating formulas, determining quantities, and mathematical calculations; high-quality tasks for solving which no calculations are required (task-questions)” [1, p. 313].

## RESULTS AND DISCUSSION

Thus, professional competencies as an integrated and generalized result of professional training are formed in the process of mastering the whole range of disciplines of the natural science, general professional cycle and professional modules, among which the most significant is the role of interdisciplinary integrative design, which we define as holistic, coordinated, ensuring the interpenetration of the complex of educational and industrial -practical activities in the training of highly otehnologichnoy industry in the dual education.

Having examined the experience of pedagogical design in psychological and pedagogical literature and pedagogical practice, we proceeded to the development of the goal-setting system of interdisciplinary integrative design, highlighting two groups of goals:

1) goals, directions that determine the formation of value orientations, worldviews, the development of interests, the formation of needs and the achievement of other personal results that depend on internal and external factors;

2) goals-results, the achievement of which is guaranteed after the completion of this system.

For the effective formation of professional competencies in interdisciplinary integrative design, it is advisable to identify effective mechanisms for the integration of educational and production activities of training technicians in the high-tech industry in dual education. In the process of experimental work together with expert employers we tested the following educational technologies and approaches:

- project method,
- business games,
- complex (didactic) tasks,
- technological maps,
- simulation and game modeling of technological processes.

However, the practice and analysis of the results of the implementation of interdisciplinary integrative design in dual education showed that the greatest effect in the formation of professional competencies of high-tech industry specialists is achieved by using the training of technicians as a mechanism for integrating educational and production activities, a project method that promotes the development of students' creative activity, improves the quality learning to a higher level.

## CONCLUSIONS

A generalization of the above allows us to conclude that the formation of professional competencies of high-tech industry specialists in the process of interdisciplinary integrative design will be effective if the components of professional competencies are integrated in the educational activity of training technicians and the integrated nature of the future nature of the professional work of high-tech industry professionals in dual education is integrated. Interdisciplinary integrative design, as the second organizational condition, provides coordinated interpenetration of general professional and special training for high-tech industry specialists in dual education through the implementation of cross-cutting projects conducted from the second to fourth year of educational activity for the training of technicians in dual education.

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