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**DUAL EDUCATION IN THE SPHERE
OF AUTOMOTIVE INDUSTRY****B. A. Zhalezka**

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This paper is devoted to the consideration of one of the innovative direction in higher education – dual education, which is especially acceptable in the sphere of automotive industry higher education. Role of the automotive industry enterprises in the educational process of technical higher education institutions is revealed. Examples of the dual education best practices in Germany and Ukraine are shown. Perspectives of dual education development in the Republic of Belarus are investigated, the experience of its elements using in different Belarusian higher educational establishments is shown. Possibility of dual education implementation in Belarusian National Technical University is substantiated, including their realization within international educational projects.

Keywords: dual education, higher educational institution, teaching technology, innovation, automotive industry.

Introduction. Correspondence of the labor market requirements and higher education content is one of the most urgent problems in modern higher education. This problem is relevant in the automotive industry and technical education especially. Development of the automotive industry requires periodically (last time – very often) modification of the education standards, curricula and syllabuses with the accordance of changes in labor market requirements. Effective training of the automotive industry employees in the professional and higher educational establishments is possible only within closed integration with the automotive enterprises. Dual education presupposes that professional education takes place in two organizations – at the professional or higher educational establishment, at the one hand, and at the automotive enterprise on the work place. Both this organizations are independent partners. The curriculum is created by order and with the participation of employers, who have the opportunity to distribute the volume of educational material into disciplines within one specialty. Employees of the automotive company act as teachers when students are trained at this enterprise. The high viability and reliability of the dual education is caused by the fact that it is in the interests of all parties involved – automotive enterprises, students (future workers and specialists of the enterprises), educational establishments, and the State. There are scientific researches, devoted to dual higher education in post-soviet countries, for example [1–3], but peculiarities of its implementation in automobile industry are not enough investigated.

Target of this research is revealing of the possibilities and advantages of the dual education in the increasing of the correspondence of automotive specialists training in educational establishments and automotive industry requirements to these specialists' skills and competences.

Results and discussion. For the automotive enterprise dual education is an opportunity to prepare personnel in educational establishment with the maximum compliance with the employers' requirements. In turn, this approach motivates students to learn. The main function of the State is to coordinate and ensure the legislative framework.

Initially dual automotive education arises in the European countries as a form of professional education. Let's review example of Germany as one of the best practices in the field of formation of three-stage system of dual education in the sphere of automotive industry.

Professional competence improvement of graduates of colleges was main objective of creation and development of dual professional education. It has been provided that 1/3 part of the training program (general education) will take place at the college, and 2/3 parts (vocational training) – at the automotive enterprise in employment of the graduates of college. At the same time students sign the contracts with the enterprises in which conditions of accident prevention, salary, holiday, trial period and others are estimated.

Graduates of schools in Germany find the suitable enterprises for dual education independently, or as a result of information events of the automotive enterprises in schools, or through the competitive selections made by these enterprises.

Final examinations have a united format for each profession at the federal level and are held at the same time by Chambers of Commerce and Industry. The share of non-successful results of examinations in average is about 10 %. College students have the right of 2 re-examinations. After passing the examinations, the graduate receives 3 certificates: college, enterprise and publicly recognized certificate by profession from the professional chamber. These certificates also have recognition outside Germany.

The role of the State in the system of dual education consists in formation of the legislation. Law on professional education contains rules for all participants of dual education, the requirement to the involved in dual training enterprises, professions recognition, payment, examination procedure. Rules of training at the enterprises are individual for each profession. They regulate training terms, the state recognition of the training results, etc. The curriculum for colleges contains the purposes and the content of training, has open character and assumes intensive interaction of the technical college and automotive enterprise during study process.

The role of the automotive enterprises in the system of dual education is central. They provide jobs for graduates, content of practical part of training, and they are responsible for training process at the enterprise and for preparation for examinations in practical part. High quality specialists from the enterprises are involved in educational process (for example, masters).

According to statistical researches, every 5th automobile enterprise of Germany is engaged in dual training. 2/3 of the students are trained at the medium-sized and big enterprises, from them 2/3 of the graduates remain to work there [4].

The role of labor unions in the system of dual education is also important. They provide tariff of payment, and conditions of students' contracts with the enterprises and extension of contracts after completion of training. Labor unions also develop the suggestions on new professions opening (together with the enterprises). Other tasks of labor unions include quality control of education at the enterprises, legal support of students in conflict situations. 20 % employees in Germany consist in labor unions. Membership in labor unions is also provided to the student receiving profession within dual education.

Thus, dual training gives students the chance of acquisition of professional competence in the sphere of automotive industry and automobile service. The artificial environment – such places for training as colleges, laboratories, professional institutions, etc. – is only partial support in acquisition and development of professional competence.

Enterprises finance 55 % expenses in a professional dual education system. The share of the State in the financing of the professional dual education system is 45 % of its total value.

The history of university dual education in Germany began in 1960s-1970s. In 1972–1974 the presentation of the "Stuttgart model" took place. The implementation and testing of the dual higher education project was carried out in Stuttgart and Mannheim HEIs. This project represents a combination of practical training at the enterprises and theoretical at the HEIs. In 1982 this project was successfully completed. Higher dual education was effectively implemented in Baden-Württemberg and later in all Germany. The equalization of dual education diplomas and traditional HEI diplomas was achieved. Along with the Bologna process dual programs for bachelor's and master's degrees appeared.

Nowadays about 40.000 companies offer dual specialties in Germany [4]. The following dual education models are currently used in world practice:

1) higher education including professional education – the most popular education model (bachelor's program in HEI and obtaining a profession at the enterprise);

2) cooperative dual education – bachelor's program at the HEI and practical periods at the enterprise without obtaining a profession;

3) dual education, integrating a profession, oriented towards people receiving (or received) a profession and wishing further development, in which the support of the employer is required (reduction of working time), and the completion of a gymnasium or professional college is not required;

4) dual distance learning in combination with full professional activity, in which the employer exempts the employee from work to attend for lectures and seminars, etc.

By time criterion, dual education models can be classified as follows [5]:

1) block model (the most distributed), which is based on blocks of 3 months (12 weeks); its advantage is concentration only for one period – theory or enterprise, and disadvantage – long-term student's absence at the enterprise.

2) the weekly model, which is based on the fact that time at the enterprise and at the HEI alternate during one week (3+2); its advantage – constant presence of the student both at the enterprise and at the university, and disadvantage – the need to concentrate on two systems.

The choice of model depends primarily on the enterprise decision. New opportunities of receiving dual training in HEIs assume 2 possible types of training – with working profession and without it. Scientific and technical progress leads to emergence of the new professions in automotive industry demanding continuous adaptation.

Advantages of the dual education in comparison with the traditional education are:

1) dual education eliminates the main lack of the traditional forms and methods of training – difference between theory and practice;

2) during dual training student acquires skills of future worker or specialist at the real workplace;

3) dual education forms a high motivation for students to acquire knowledge and skills in their work, because the quality of their knowledge is directly related with the performance of their duties at the workplace and future employment;

4) automotive enterprise managers have high interest in the qualified practical training of students (their future employees);

5) educational establishment takes into account the requirements of employers to their graduates.

Disadvantages of the dual education consist in the following [5]:

1) insufficient attention is paid to scientific research and preparation for scientific career, which creates difficulties when entering classical master's degree and postgraduate studies;

2) heavy load on the student (he can at the university and at the enterprise), absence of semester holidays (vacation from the enterprise is only 25–30 days);

3) difficulties with the termination of dual education (sometimes it is necessary to return the paid funds to the employer in the case of study termination);

4) emphasis on one special direction and actual lack of opportunity (as in classical university education) to undergo different practices and adjust the direction of study and specialty.

At present, elements of dual education are widely used in the process of training specialists in HEIs of Ukraine (Kiev National Transport University, Uzhgorod National University), for example, in cooperation with Skoda automotive enterprise.

The international TEMPUS project «Fostering the Knowledge Triangle in Belarus, Ukraine and Moldova» (FKTBUM, 543853-TEMPUS-1-2013-1-DE-TEMPUS-SMHES), financed by the European Commission grant, coordinated by Paderborn University (Germany) and realized in 2014–2017 years allowed to disseminate elements of German and Ukrainian best practices in the sphere of dual education at the Belarusian HEIs [6, 7]. Nowadays in Belarus the dual elements partially implemented in Belarusian National Technical University (BNTU), Belarusian State University of Informatics and Radioelectronics, Sukhoi Gomel State Technical University and others, but a complete system of dual education does not yet exist.

The experience of dual education elements implementation in Belarusian HEIs is characterized by the following directions [5]:

- 1) targeted training of specialists;
- 2) active participation of partner organizations in training of specialists;
- 3) combining university studies with work in partner organizations;
- 4) individual selection of candidates for employment (distribution);
- 5) a large share of practical training in curricula.

For successful distribution of graduates HEIs need to train the experts conforming to requirements of employers. Training of such experts without participation of the employers is not always effective, especially in the field of automotive industry.

The organization of dual training in Belarusian HEIs, and in particular in leading technical Belarusian university BNTU, will promote to improvement of the automotive specialists training quality. The automotive enterprises will actively participate in educational process for formation of the required competences. It will provide fixing of young specialists at the automotive enterprises and will not demand terms of their adaptation.

Conclusion. Thus, the existing international and national experience of integration of the higher education with innovative automotive enterprises, allows allocating the following directions of coordination of the higher education with requirements of employers:

1) dual education as innovative the direction in the field of the higher education, successfully used in the European countries, can become the prospect of development of the technical higher education in Belarus, in particular, in the sphere of automotive industry;

2) realization of the international projects (the programs TEMPUS, Erasmus and others) in HEIs allows exchanging of experience and introduction of best practices of foreign HEIs in Belarusian educational environment, providing fast and successful adaptation of automotive higher education to the changing labor market conditions;

3) development of the innovative, demanded by employers specialties in the sphere of automotive industry and service will promote high quality education and compliance it to international level.

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ДУАЛЬНОЕ ОБРАЗОВАНИЕ В ОБЛАСТИ АВТОМОБИЛЬНОЙ ПРОМЫШЛЕННОСТИ

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Статья посвящена рассмотрению одного из инновационных направлений в высшем образовании – дуальному обучению, которое особенно актуально в области высшего образования в сфере автомобильной промышленности. Определена роль предприятий автомобильной промышленности в учебном процессе технических вузов. Представлены примеры успешного опыта дуального обучения в Германии и Украине. Исследованы перспективы развития дуального обучения в Республике Беларусь, а также опыт использования его элементов в различных белорусских вузах. Обоснована возможность внедрения дуального образования в Белорусском национальном техническом университете, включая его реализацию в рамках международных образовательных проектов.

Ключевые слова: дуальное образование, высшее учебное заведение, образовательная технология, инновация, автомобильная промышленность.

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