АКТУАЛЬНІ АСПЕКТИ РОЗВИТКУ STEAM-ОСВІТИ ТА ДУАЛЬНОЇ ОСВІТИ В УМОВАХ ЄВРОІНТЕГРАЦІЇ

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DUAL EDUCATION SYSTEM

Abstract. *In this article on an example of concrete professional educational institutions of Ukraine and college foreign countries we will try to show particularly: what industrial educational base exists today in professional institutions of Ukraine and in colleges of the USA, Canada and the Great Britain; as the vocational training system developed; what changes have taken place in its structure; as it has affected quality of education of pupils. Researches were done in an educational complex of Kropivnitsky which has today the name "the Regional centre of vocational training of O.S. Yegorova" and the Higher professional school of №7 in Kremenchug.*

Today the dual system of training is being practised by number of the countries, especially in Germany, Austria, Bosnia and Herzegovina, Croatia, Serbia, Slovenia, Macedonia, Montenegro and Switzerland, in Denmark, the Netherlands and France, last years in China and other countries of Asia. All sites are filled by praising responses about dual system of training on the Internet. All sites had been (in the early nineties of the XX-th century) filled by the same praising responses about modular system of training. If to compare these two systems of training the modular system of training was much better, than dual system of training. The answer to these questions can only be given by the long pedagogical experiment. It is connected by the second part of training (in modular system of training), namely, practical vocational training was carried out on the special developed modular elements and methodically competently executed on base of an educational institution. After college students had exercised all practical skills and abilities on college base and they passed the exam, they went to facilities.

The dual system of training as we already mentioned, is broken into two big stages. The first tier is theoretical, i.e. using new technologies, namely PC: get to know their profession; begin to study separate elements of the profession, again, with help of PC. As all process of training lasts 1 or 2 years then in the first case theoretical process of training lasts half a year. And then, at the facilities they pass the practice under the guidance of the instructor. But we have many questions: 1) why does the instructor have 5 students? 2) How will the instructor supervise the process of operations having 5 students? There are a lot of such questions.

Key words: *educational process, speciality, average professional educational institutions, college.*

Stating the problem. Such a moment comes at all times, when in an education system we come to a question how to teach further? We are under impression, that something is absent in the educational system. And then, the old, forgotten for a long time models of training come to the aid:

"Problem training", "the Programmed training", "the Method of supporting summary", "Modular training". And suddenly "Dual system of training" that we may call – "Panacea from all troubles" appears.

Therefore with the help of this article we will try to answer a number of necessary questions which we have today. One of them is: why does "Modular system of training", "Credit-modular system of training", "the Method of basic abstracts" appear before "Dual system of training". We are under the impression, that this model of training can solve all problems in educational system in Ukraine.

Analysis of recent research and publications. Theoretical researches, practical researches and their realisation in practice have brought the big contribution to development of system of labour training and vocational training by scientists (S.J. Batyshev, A.P. Beljaeva, B.S. Gershunsky, N.K. Deyev, A.G. Kalashnikov, E.G. Kostjashkin, D.A. Thorzhevsky, V.K. Sidorenko, M.M. Shkodin, A.G. ShChekoldin and others). They have given a certain picture of development of a professional education system during this period (till 1991). Today this work has been continued by R.S. Gurevich, K.N. Kathanov, H.G. Nichkalo, V.V. Oleinik, V.O. Radkevich and others.

The special contribution to foundation and development of average professional educational institutions was made by academician S.J. Batyshev [7]. This preparation of pupils begins after ending 9 classes of school. Under the guidance of academician S.J. Batyshev this model of preparation of experts has been developed in 60-70 years of last century [1, 72-116] which exists also nowadays.

Formation of purpose of the article – is to carry out the comparative analysis of development of vocational training and to study the application of different methods of training in these educational institutions in Ukraine and foreign countries.

In this article on an example of concrete professional educational institutions of Ukraine and коледжей foreign countries we will try to show particularly: what industrial educational base exists today in professional institutions of Ukraine and in colleges of the USA, Canada and the Great Britain. As the vocational training system developed, what changes have taken place in its structure as it has affected quality of preparation of pupils. For research the taken an educational complex Kropivnitsky which has today the name «the Regional centre of vocational training by it were us. A.S. Yehorova» and the Higher professional school of №7 Kremenchug.

Presentation of the main material. It is important to notice, that education of highly skilled workers was entrusted to average professional educational institutions. The reason of that is that these teachings of educational institutions, vocational and special disciplines in connection with general educational disciplines were very strictly observed. General educational disciplines were stated in such way, that to carry out communication with that special discipline was studied from a concrete profession. Thus, the chain of communications between concrete discipline and general educational disciplines was built.

Dual training is a kind of training at which the theoretical part of preparation passes on the basis of educational institution, and practical - on a workplace. The father of dual system of vocational training in Germany was George Kershenshtainer (29.07.1854-15.01.1932). He was a German teacher and since 1895 till 1919 was the head the Munich school city council, took part in national reform of the school curriculum.

The term "dual system" has been introduced to pedagogical terminology in the mid-sixties years to Germany – as new, more flexible form of the organisation of vocational training.

Today the dual system of training is practised by number of the countries, especially Germany, Austria, Bosnia and Herzegovina, Croatia, Serbia, Slovenia, Macedonia, Montenegro and Switzerland, in Denmark, the Netherlands and France, last years in China and other countries of Asia. On "Internet" all sites are filled by laudatory responses about dual system of training. The same laudatory responses had been (in the early nineties of the XX-th century filled all sites by modular system of training. If to compare these two systems of training the modular system of training was 10 times better, than dual system of training. Answer these questions long pedagogical

experiment can only. It is connected by that the second part of training (in modular system of training), namely, practical vocational training was carried out on the special developed modular elements and methodically competently executed on educational base of an educational institution. After students of college have fulfilled all practical skills and abilities on the basis of college and they have handed over offset went on practice on the enterprises.

The dual system of training as we already marked, is broken into two big stages. The first grade level is theoretical, i.e. using new technologies, namely personal computers: get acquainted with the profession; start to study separate elements of a profession besides by means of the personal computer. As all process of training is calculated for 1 or 2 years in the first case theoretical process of training lasts half a year. And then at the enterprises they passed to practice under the guidance of the instructor. But we have many questions: 1) why at the instructor of 5 probationers?; 2) as the instructor will supervise process of performance of those or other operations at 5 probationers? And at us it is a lot of such questions [6].

It is necessary to understand, that for each profession it is necessary to choose that method of training at which it is possible to receive the biggest positive effect in the course of training.

For example, there is a profession called sapper. It is a profession where one cannot make any mistakes while doing any task. And now imagine, if we apply a 100 point scale to assess the tasks of this profession.

This profession should have 2 criteria of estimation – correct and incorrect. How it is possible to apply a 100 mark scale to estimate the quality to this profession?

This category consists of such professions as: 1) all electro-technical and radio engineering professions; 2) operators of difficult systems (dispatchers of nuclear, thermal and hydroelectric power stations; drivers of vehicles; pilots, navigators, captains of sea courts, dispatchers of the airports, factories and others). Referencing S.J.Batysheva's classification these professions relate to 4 groups of complexity [8, p. 123].

To the contrary to European education system of personnel in 1969 were developed, and in 1970 building of average professional educational institutions in all regions of the country has begun. The feature of average technical training colleges is the passage of practice by students on their workplaces. In that time the basic part of educational institutions has been fixed to the industrial facilities. During the building of average professional educational institutions and further at their maintenance all has been provided for fixing all pupils of these institutions to the base facilities. The reason was that the task was to prepare young highly-skilled personnel for the base facilities (metallurgical, building, aviation area and other).

It is important to note, than the training and education system in average professional educational institutions and in colleges of foreign countries differs. Preparation of students in average professional educational institutions begins after the termination of 9 classes of school. This model of preparation of students has been developed in 60-70s of last century. Only in Kirovograd (today Kropivnitsky) four average professional educational institutions for education of professional staff have been constructed. The full complex of these educational institutions consists of: 1) 4-storey educational facility, 2-storey workshops, cafeteria, a sports hall and other auxiliary rooms. 2) There are educational offices on vocational and to special subjects (they were prioritized), and also educational offices for general educational subjects. One can study more about it in more details in source [1, 5, 6]. A very powerful theoretical and industrial educational base was created today in "the Regional centre of vocational training of A.S. Egorov" in Kropivnitsky. If to consider educational offices on theoretical vocational training, it is possible to notice, that they meet the modern requirements. In all educational offices (there are 28 of them) the big flat monitors are located on a wall, and there is a laptop on the table for every teacher (pic. 1).

If we look into educational-methodical equipment of industrial workshops in average professional educational institutions ("the Regional centre of vocational training of A.S. Yehorova" and the Higher professional school of №7 in Kremenchug) in comparison with colleges of foreign countries (Germany, Austria, Bosnia, Herzegovina) and other countries we would see that there is a

formation of educational-methodical base on high modern tier in our educational institutions. There is one of the three educational workshops where students get the profession "Cook" and "Confectioner" during the 3 years of training and get skills at manufacturing of any dish by a profession "Cook" and abilities of manufacturing of any confectionery products by a profession "Confectioner". The main advantage, is that students work all the time under the supervision of the master of technological training.

The educational base of all three workshops is for 15 workplaces. Each place is equipped with a table for processing of products, a sink and an electric cooker. It allows doing all works on manufacturing of any dishes frontally. In process of processing of products the master of technological training shows the process to students at first. There is a television camera in workshops which is situated near a chopping board, and images are transferred to the monitor for such purposes. There is a boiler if hot water is needed. There is an "Exhaust system" over each workplace. There are conditioners in workshops if the temperature rises. There are no such workshops in foreign colleges because it is very expensive and they try to save money. Therefore the new system of training under the name "Dual system of training" has been thought up.

Pic. 1 Educational classroom of technologies

Pic. 2 Workshop for cooks and confectioner

A very powerful industrial educational base: 1) electro assembly workshops; 2) a workshop of machine tools with numerical programmed control; 3) welding workshops in the Higher professional school of №7 Kremenchug was created. I would like to note a workshop of machine tools with numerical programmed control with five machine tools are installed. Special pride of all members of school is welding workshops in which the equipment with the help «Institute of electric welding of. B.Ye.Paton» was installed. Once again it is important to direct attention, on that the high-quality expert can be prepared in our educational institutions, especially in the average professional educational institution. And to it there is a good example.

The yesterday's graduate of the Higher professional school of №7 in Kremenchug, the young welder of Krjukovsky car-building factory Victor Grigorash took part in the International competition of welders (2017 China) dedicated to the creation of the International institute of welding to the 70 anniversary on which has took the 1st place. The Ukrainian pupils took part at the same competition and have won such awards: 1) Alexander Lukina - a silver medal, Kiev; 2) Danil Ostashev - a bronze medal, Kharkov; 3) Anastasiya Stahansky - a bronze medal, Ternopol.

The countries of the western Europe, the USA, Canada and other countries where the dual system of training prevails. On a pic. 3 and pic. 4 the groups of five students who pass the practice at the facilities are shown. On a pic. 3 College of the Great Britain in Southern Cheshire - there are 12 000 students, 29 professions. On a pic 4 College Seneka - there are 100 000 students, 62 professions. Educational-methodical base cannot be created in Europe.

Pic. 3 College of Great Britain

Pic 4. College of the USA

To create the educational-methodical base in colleges of Europe it is necessary: first, to create practical educational-methodical base in colleges (these are workshops which have everything necessary), secondly, it is necessary for these workshops to have masters of technological training who have graduated from profile technical institutions, have worked not less than 7 years in their branch and have 5-6 industrial category and corresponding group of the admission on an electro-security.

Conclusions. Preparation of professions of 4 groups of complexity and which preparation models in professional institutions of Ukraine and in colleges of the USA, Canada and the Great Britain [1 exist, c.338; 2; 3] has been considered. The features in the process of preparation of difficult vocational and special subjects.

Long scientific researches and experimental check of teaching of different systems of training ("Problem training", "the Programmed training", "the Method of supporting summary", "Modular training") in professional educational institutions have shown, that:

1. It is necessary to create the educational-methodical base in colleges of similar average professional educational institutions.
2. While studying difficult vocational and special subjects for different professions, methods of training should be different.

3. In the process of doing the work in workshops by students it is necessary to apply face-to-face methods of training.

Vocational training reform is one of the most relevant of problems in Ukraine. Because, after all without highly-skilled personnel any economy and industry areas cannot develop, and any backlog will lead to a decrease in a standard of living of the population in Ukraine.

It is necessary to notice, that facilities of average professional educational institutions have been constructed in many countries of the world and foreign citizens are gladly engaged. It is southern Korea, Mongolia, Somalia, Nicaragua, Cuba and other.

Opportunities of the further researches. They consist of selection, and research of educational institutions of different types and structures, details of their principles and training methods, and also methodical instructions on the organisations of educational process and the comparative analysis with typical foreign educational institutions which will allow to define a direction of vocational training of the future qualified workers

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ДУАЛЬНА СИСТЕМА ОСВІТИ

У статті проведена порівняльна характеристика середніх професійно-технічних навчальних закладів України і коледжів Європи. У даній статті ми спробували показати їхню відмінність у структурі й методах підготовки фахівців у цих навчальних закладах. У роботі розглянута структура навчальних закладів такого типу, система підготовки учнів. Дослідження показали принципову відмінність, як навчальних закладів, так і методів підготовки в них. Практична значимість цієї роботи полягає в тому, що показана порівняльна характеристика навчальних закладів різних типів і відмінна риса практичної підготовки в них.

Ключові слова: навчальний процес, спеціальність, середні професійно-технічні навчальні заклади, коледж.

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