

## Modern forms of professional education modernization of rural youth

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### Suggested Citation:

Shokanov, R. (2021). Modern forms of professional education modernization of rural youth. *New Trends and Issues Proceedings on Humanities and Social Sciences*. 8(3), pp 215–227.

<https://doi.org/10.18844/prosoc.v8i3.6413>

Received from February 21, 2021; revised from May 23, 2021; accepted from August 28, 2021.

Selection and peer review under responsibility of Assoc. Prof. Dr. Jesus Garcia Laborda, University of Alcalá, Spain.

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### Abstract

The article is devoted to an experimental study conducted between September 2017 and September 2020 at Aktobe Regional University named after K. Zhubanov and Khromtau Mining and Technical College of Aktobe Region. The purpose is to study the modernizing aspects of the specialized education of rural youth through the development and operation of internship sites on the example of educational organizations of the Aktobe region. Research methodology include a set of empirical and theoretical methods: abstraction, analogy, modeling, analysis, synthesis; study of economic, social, psychological and pedagogical literature; experiment; modeling, forecasting, argument; psychodiagnostic methods: survey, questionnaire, testing. The end result is the form of work of internship sites in the professional education system, intended for rural students. Methodology, technological, social and economic aspects have been developed. It is also necessary to highlight the advantage of internship sites - coverage of practical-oriented educational bases according to the received specialties.

Keywords: vocational education, internship sites, dual education, digitalization, rural youth, rural labor market.

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## 1. Introduction

The key task of modern Kazakhstani vocational education is the state programme for the development of education and science in the Republic of Kazakhstan for 2020–2025. To achieve it, the main directions have been identified, among which it is necessary to highlight: the development of students' skills of the 21st century and equal access to inexpensive and high-quality technical vocational and higher education. This contributes to the provision of an effective, competitive specialist of a certain profile at the end result. Modification of the socio-economic external and internal conditions also dictates the need for a qualitative new level of training for young personnel. This can be achieved through the transition of educational institutions of secondary and higher professional education to an innovative way of development, which allows to ensure the growth of the effectiveness of training.

Geographic territorial, demographic, climatic and social conditions of Kazakhstan indicate a sufficient proportion of the population living in the countryside. In Kazakhstan, the percentage of the rural population is 7,649.1 thousand people (42%). Internationally, the Kazakh model of vocational education considers the dual training system as a modern form of modernisation of vocational education in accordance with European standards, as well as an important long-term priority of the state policy of the Republic of Kazakhstan. Along with obtaining a working profession, the formation of entrepreneurial skills among young people is ensured. Also, Kazakhstan is a participant in the Torino process, which provides an opportunity to work out effective steps for the development of the domestic TVE system. At present, more than 400 colleges and 2,200 enterprises are participating in dual education in the republic.

## 2. Purpose of the article

The purpose is the dissemination of the results of the study on the modernisation of specialised education for rural youth in the Republic of Kazakhstan. The implementation of this purpose is based on the structural and functional modelling of the forms internship sites that implement the modernising policy of profile dual education for rural schoolchildren in Aktobe region, as well as the algorithm of their work.

The prerequisites for the development of the experimental study were the fact that Aktobe region is a large industrial region exporting mineral raw materials. The main product exported by Aktobe region is mineral raw materials (67.2%). Khromtau district is the leading mining area not only in Aktobe region, but also in Kazakhstan (<http://hromtau-hgtk.kz/ru/>).

## 3. Methods

To carry out the research, a complex empirical–theoretical method was chosen: abstraction, analogy, modelling, analysis and synthesis; study of economic, social, psychological and pedagogical literature; experiment; modelling, forecasting, argumentation; the psychodiagnostic methods used are survey, questioning, testing, introspection and self-assessment; methods of mathematical and statistical processing of the information received; and methods of graphic processing of the information received. The chosen methods are substantiated by the methodological foundations of scientific research that meet the requirements of fundamental and applied scientific research.

The scientific and theoretical bases of the study are the works of national and international scientists: competence-based approach in specialised education by Zhaitapova (2010) and Glazyrina (2016); dual training as an effective way to train personnel in Kazakhstan by Usenova (2014) and Zhankuanysheva and Ismailova (2018); analysis of foreign experience in training competitive personnel in organisations of technical and vocational education by Bukashkina and Ivleva (2010) and Oshakbaeva and Zhanaberdieva (2009); cooperative vocational training by Zaurbekova and Shonaeva (2009) and Auezova and Ospan (2017); management of education development and state regulation

in the field of higher education by Balykhina (2003) and Belyakova (1997); and methods of studying and generalising pedagogical experience by Gershunsky (1983) and Eroshin (1997).

#### 4. Results

In the Republic of Kazakhstan, the basis for the continuous modernisation of vocational education is the words of President K. Tokayev at a meeting of the Council of Foreign Investors on 4 July 2019, on the development of human capital in the country. Thus, the electronic magazine Forbes says: 'According to the President, the main tasks at this stage are the transition of the personnel training system to a qualitatively new level, reducing the gap between the quality of personnel training and the demand in the labour market. In particular, it is necessary to modernise the vocational education system, strengthen the link between higher education and enterprises and business' (<https://forbes.kz>).

The state programme for the development of education and science of the Republic of Kazakhstan for 2020–2025 highlighted a number of problems, which are as follows:

(1) There is no effective system of career guidance. In 2015, the share of young people of typical age in TVE (14–24 years old) was only 16.1%;

(2) According to the GIK EEF-2018, the average assessment of the quality of the TVE system by employers is 3.8 points below average. As a result, employers are not motivated to invest in training future workers. In 2018, only 0.5% of the entire contingent of students studied at the expense of employers. The coverage of dual education of students also remains as low as 8%;

(3) The indicators of colleges, which confirm the quality of training of specialists, are low. Only 16% of them have passed national accreditation;

(4) The practice of independent certification of TVE graduates in certification centres registered in the register of the National Chamber of Entrepreneurs 'Atameken' requires expansion;

(5) There is shortage of engineering and teaching staff and masters of industrial training. The low level of wages does not allow attracting experienced workers from production to teaching;

(6) There is a low share of vocational training masters in the TVE system. In developed countries, teachers and masters of industrial training are practicing specialists or undergo an internship in production once every 3 years;

(7) The outdated material and technical base of colleges does not ensure the quality of training and the attractiveness of the TVE system. The issues of creating conditions for non-resident students have not been fully resolved. Only 74% of rural students have the opportunity to get places in hostels.

The evolution of the worker labour market has brought new challenges to the TVE system. The TVE system has a key role to play in the context of social benefits, primarily for individuals and society as a whole.

The need to modernise the systems of higher and professional education in Kazakhstan in the context of large-scale economic reform and the creation of fundamentally new organisational, legal and socio-economic conditions set by the requirements of state building and modernisation of the system of educational institutions, accompanied by large-scale institutional and integration transformations in educational systems, is the main task of quality professional education.

The significance of the problem of organising management and increasing the efficiency of the functioning of the Kazakhstani education system and the insufficient development of these issues in theoretical and methodological aspects determine the relevance of experimental research in this direction. The analysis of world and domestic practices is also justification of the relevance. Thus, world practice has developed various models of interaction between the labour market and educational services (Dobrenkov, 2005), which are presented in Table 1.

**Table 1. National models of interaction between the labour market and educational services**

Country	Characteristics of the interaction model of the educational services market and the labour market
Germany	Maximum approximation of education to the demands of the labour market by strengthening the practical component of education
Denmark	Maximum focus on the practical side of learning
Great Britain	The presence of a large number of intermediary structures that ensure the relationship of educational institutions and business structures
Sweden	Significant government presence in these markets through regulatory and institutional activities
France	Significant role of the state in matters of youth employment, development of internship practice at public and private enterprises.
USA	Integration of scientific and educational organisations and industrial structures in the form of technology parks or public–private partnerships
Japan	Significant career guidance activities

In Europe, a system of ‘dual education’ has been developed and is successfully operating, which combines teaching theory within an educational institution and learning at an enterprise. Currently, the dual training system is the main training system in 60 countries, including Germany, Austria, Serbia, Slovenia, Macedonia, Montenegro, Switzerland, the Netherlands, Denmark, France and some Asian countries. The peculiarities of the industrial policy of these states should be taken into account.

In Germany, the majority of young people (55%) after school acquire one of the 350 officially recognised educational professions within the framework of the ‘dual system’. 80% of the students at the school work in enterprises. For the remaining 20%, special classes ‘without practical training’ are created, which is considered an extremely low prestige. At the end of the course of study in a vocational school, a certificate is issued, which is valid only in combination with a document on the completion of industrial training at the enterprise and gives the right to enter the university. The diploma exam in the profession is taken by representatives of self-government bodies of the private economy, i.e., regional handicraft or chambers of commerce. The combination of theory and practice guarantees the high qualifications of artisans and workers. Employers highly value ‘dual training’ from a ‘German master’ because the student from the very first steps gets used to a specific industrial atmosphere and learns many things that cannot be read from books.

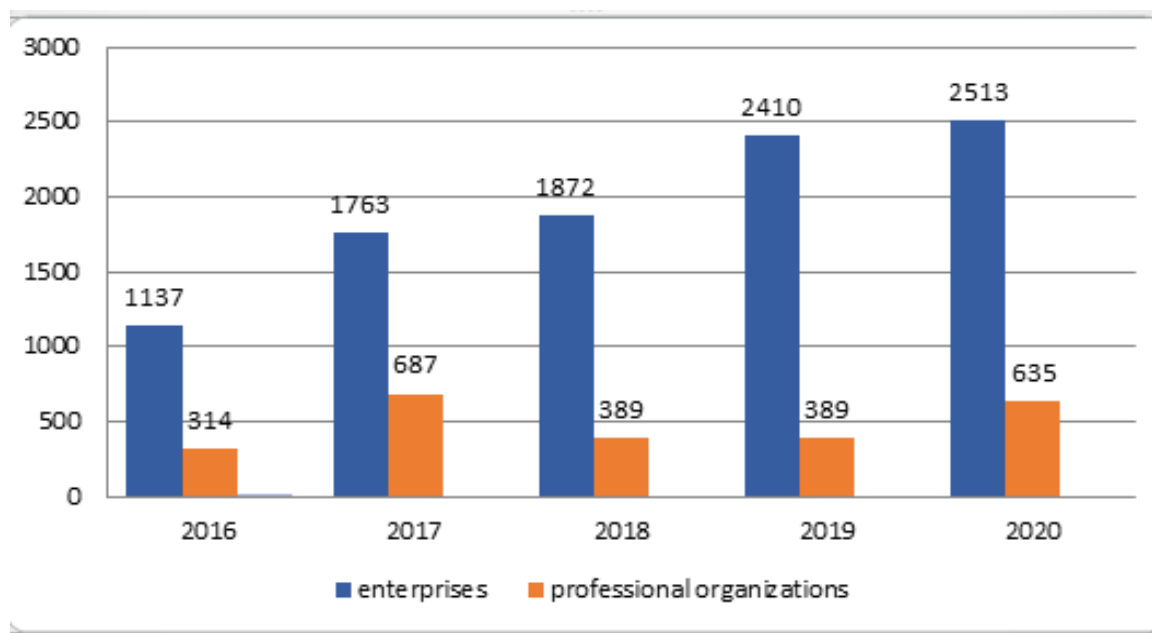
In Austria, small towns have city-forming industrial enterprises. Some of the examples are mining (silver mines, Schwarz), production of automobile motors (Graz and Staer), Swarovski crystals for jewellery and optics (Watens). All enterprises certainly have a school of the swarow and a training centre where you can comprehend ordinary school subjects with teachers and prepare for the exam for the certificate of maturity of a professional. In these schools, the approximate study/practice ratio is three is to two, in secondary vocational institutions it is two is to three and in the School of Occupation in the Company it is one is to three.

In Russia, from the experience of the pilot regions, one can see that the general conditions for organising vocational education are determined by the regulatory acts of the constituent entity of the Russian Federation. The documents may have different names, but, as a rule, this is the ‘Regulation on dual training’. An example is the creation of a district educational and methodological centre for dual education in the North Caucasus Federal District, Stavropol Territory, which included such enterprises as OJSC ‘Georgievsky Valve Plant’; JSC ‘Kholod’, Pyatigorsk; and JSC ‘Bakery Georgievsky’.

The leading groups for the functioning of trainee sites in the vocational education system are alternative forms – a dual system, a cooperative form of training and mentoring. These include Germany, Austria, Switzerland, Netherlands, Denmark and France. Corporate experience in the field of youth employment is presented in the countries of Azerbaijan, Armenia, Kazakhstan and Russia.

Domestic experience in the system of higher and secondary vocational education is the introduction of dual education at the Women’s Pedagogical State University, Ekibastuz Engineering and Technical Institute named after Academician K. Satpayev, Pavlodar College of Transport and Communications, Karaganda State University named after academician E.A. Buketov.

In Kazakhstan, the National Chamber of Entrepreneurs of the Republic of Kazakhstan ‘Atameken’ conducted an analysis on educational organisations that have introduced the dual system of vocational training (<https://atameken.kz/ru/services/22-dorozhnaya-karta-dual-nogo-obucheniya>). The leading groups for the functioning of trainee sites in the vocational education system are alternative forms – a dual system, a cooperative form of training and mentoring. These include Germany, Austria, Switzerland, Netherlands, Denmark and France. Corporate experience in the field of youth employment is presented in the countries of Azerbaijan, Armenia, Kazakhstan and Russia.



**Figure 1. Educational organisations of the Republic of Kazakhstan with the introduction of elements of dual education**

According to [www.nur.kz](http://www.nur.kz), the most promising areas for the implementation of dual education in Kazakhstan are educational institutions of a technical, technological and agricultural profile. The reason for this was the crisis situation in the Kazakhstani system of training specialists, which emerged from the following aspects:

(1). For a long time, educational institutions of a technical and humanitarian profile were guided exclusively by those educational standards that were determined by the state. At the same time, the future employer was not asked what kind of specialist he expects.

(2). Enterprises became private and the relationship ‘university (college)–production’ was broken.

However, the economy, education, healthcare, social and scientific and technical spheres are rapidly developing and require ready-made specialists who, from the very first days of work in production, will have a clear idea of the tasks and the technology for their implementation.

One of the ways to solve this problem, as well as an alternative to dual training, is the technology of internships. In our opinion, there are similar forms of work between the work of internships and the dual form of training; the differences should also be highlighted. The main difference is the fact that internship sites allow the student, already in the first year, to closely face the qualifications of the chosen profession. The student is paired with a mentor who guides him through the entire period of

study. Also, in connection with the latest world events, the virtual internship site will serve as a bridge between the master and the student in unforeseen situations.

In Kazakhstan, the form of internship sites as a form of professional development was tested on the basis of the Aktobe Regional University named after K. Zhubanov and the Khromtau Mining College.

Advantages of the Aktobe Regional University named after K. Zhubanov for conducting research on trainee sites are as follows: bachelor's degree in specialties operating in the countryside such as 'B060 – Chemical Engineering and Processes', 'B062 – Electrical Engineering and Energy', 'B065 – Motor Vehicles', 'B068 – Food production', 'B071 – Mining and mining' and other specialties. In general, 15,101 students are currently studying at the university, of which 67% are residents of rural regions. The university implements EP with elements of dual education. Currently, 17 branches of departments are actively operating in production, including the technical direction (5); the direction of business and law (5); the pedagogical direction (3); and the direction of agriculture and ecology (4). The innovative aspect of the university is the functioning of the Park of Innovative Technologies, which includes a research centre, six scientific laboratories and one training laboratory. Its activities are aimed at creating favourable conditions for the development of innovative activities in the region by introducing an effective mechanism for comprehensive support for the creation and development of innovative enterprises. On the basis of this Techno park, there are joint laboratories with the university: 'microscopy and analysis of nanomaterials'; 'polymer composite materials'; 'magnetron sputtering'; 'analysts of streaming data and machine learning', 'robotic systems', 'research and management of traffic flows', '3D modelling', 'analysis of nanomaterials', 'biological control of the environment', 'research of industrial waste disposal methods', 'heat mass and mass transfer processes of chemical technology', and 'research of modern processes of the Turkic languages'.

The advantages of the Khromtau Mining College in Aktobe region of the Republic of Kazakhstan is that, since 1979, it has been the main educational institution that trains qualified specialists for the Donskoy Mining and Processing Plant. Donskoy Ore Mining and Processing Plant, a branch of TNK Kazchrome JSC, is the largest enterprise for the extraction, processing and concentration of chrome ore in the mining industry.

According to [www.stat.gov.kz](http://www.stat.gov.kz), the production of copper–zinc ores and chrome ores, zinc and chromium concentrates, electric and thermal energy has (110.1%) increased in the Khromtau district. In the mining industry and quarrying in the reporting period, the physical volume index was 100.7%. The volumes of extraction of metal ores are 110.2%, while the other branches of the mining industry are 136.3% and technical services in the field of the mining industry 152.4% (Eserkepov, 2003). This information serves as the basis for studying the issue of creating internships on the basis of cooperation between the college and the branch of TNK Kazchrome JSC.

The Khromtau Mining and Technical College has historically been training workers and mid-level specialists for the Donskoy Ore Mining and Processing Plant, Voskhod-Oriel LLP and TNK Kazchrome JSC. These enterprises demonstrate a steady demand for specialists (electricians, tunnellers, welders, auto mechanics and laboratory assistants) and assist in organising the internship of students with the signing of contracts for industrial training, industrial practice and contracts for subsequent employment.

The obvious advantages for participation in an experimental study of the Khromtau Mining and Technical College, taking into account the sectoral development of the region of the chosen specialty, are as follows:

- The largest and well-known social partners;
- Qualified teachers and masters of industrial training who have completed training at enterprises and in the countries of near and far;



- The educational institution has introduced a dual training system;
- The teaching staff of the Kazakh National Technical University and the Magnitogorsk State Technical University named after G.I. Nosova;
- Monitoring and forecasting the demand for specialties (together with social partners);
- A centre of competence for the mining industry was opened;
- Course training, retraining and advanced training of workers of mining enterprises in the region are being conducted;
- Participation in WorldSkills championships;
- Almost 100% employment in this specialty.

The college entered the Republican State Programme ‘Zhas Maman’, which also allows training specialists in the demanded industrial, mining and mining and metallurgical professions according to new standards, improve the qualifications of teachers and significantly expand the opportunities for employment and professional self-realisation of graduates.

As part of the experiment, the main directions of interaction between specialised educational organisations and enterprises were developed within the framework of the internship sites (Table 2).

**Table 2. Main directions of interaction between specialised educational organisations and enterprises within the framework of the internship sites**

<b>Economic support</b>	<b>Management of educational activities</b>	<b>Scientific research support</b>
	<b>Organisational</b>	
– Development of the foundations of investment activities	Joint development of academic programmes	Implementation of joint research projects
– Creation of the activities of the supervisory board		
	<b>Main</b>	
Development of the material and technical base:	– Organisation of conferences, round tables, workshops	– Equipment of laboratories (educational and production complex)
– Modernisation of existing facilities	– Joint development of targeted training programmes personnel	
– Joint operation of educational infrastructure		
Material support of teachers, students:	Teaching specialised disciplines and conducting special seminars	Opening of training internship sites on the basis of the enterprise
– Granting		
– Payment of scholarships		
– Organisation of internships		
Organisation of trainings with potential employers	– Organisation of practice – Joint examination (qualification)	Activities of training internships on the basis of the enterprise

The organisational part includes the signing of two (university) or tripartite (college – regional education department – enterprise) contracts, which spell out the main regulatory and activity issues for the functioning of internships. The implementation of such a model is envisaged during the entire training period – from one to four courses, but practical training in real production conditions starts from the second course. A special feature of the first course is excursions to enterprises of the oil and gas industry, meetings with employees of the enterprise which are organised within the framework of the educational work programme of the educational organisation. Depending on the specifics and financial capacity of the enterprise, students receive incentives in the form of additional scholarships during the period of active internship.

In the course of the experiment, resources for the development of competencies were developed within the framework of the activities of internships on the example of the specialty ‘B071 – Mining and mining’. In this case, the features and specifics of production are taken into account, as well as the organisation of the effectiveness of the educational process. Various manufacturing enterprises have the opportunity to provide future graduates with experience in mastering various competencies: a number of workshops (enterprises) improve the skills of one group of labour functions, others – another group of labour functions etc. Students are given the opportunity to move around, mastering various competencies and labour functions provided for by the state educational standard of higher education and the professional standard of secondary education.

In general, it should be noted that 70 students of the Khromtau Municipal Technical College, five teachers (in special disciplines and masters of industrial training) took part in the experiment. A total of 110 students and 15 teachers of professionally oriented disciplines took part in the Aktobe Regional University named after K. Zhubanov.

The diagnostics consisted of several forms of questionnaires: ‘Questionnaire of a trainee graduate’ and ‘Evaluation of employer’s satisfaction with the quality of graduates’ training.’

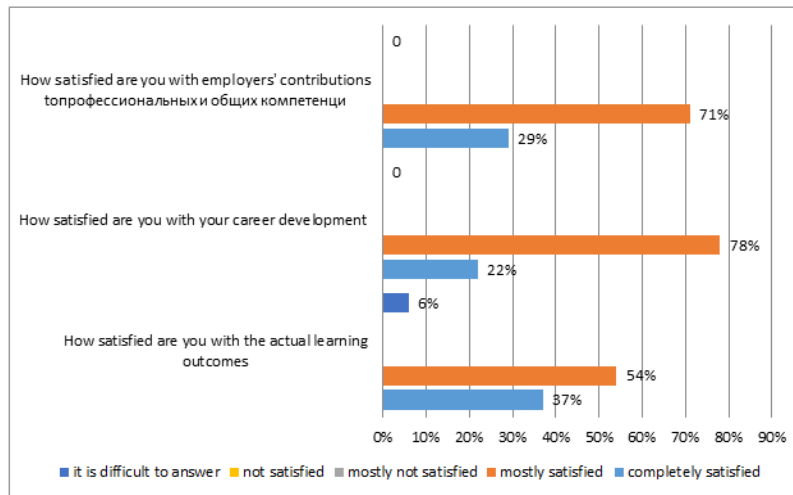


Figure 2. Results of the diagnostics of students on the course of the experiment

The results of this diagnostics indicate that the internship sites provided positive motivation for further professional development as a graduate of a vocational educational institution.

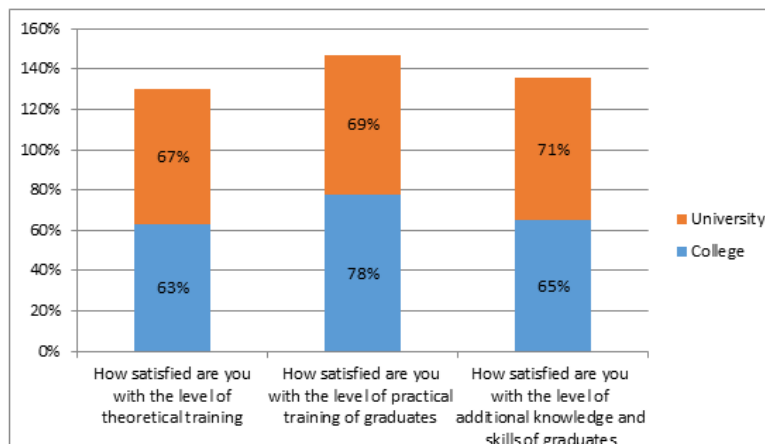


Figure 3. Results of diagnostics of labour enterprises (bases of internship sites)



Based on the analysis of satisfaction with professional and general competencies, the following were revealed:

- An increase in the percentage of students satisfied with the actual learning outcomes from 63% to 100%, which indicates positive dynamics in the implementation of internships;
- Satisfaction with career development increased from 57% to 94%;
- Assessing the compliance of the level of training of specialists with the requirements of the labour market, they revealed an increase in compliance from 54.6% to 72.7%, and the discrepancy was noted by 9.1% of the respondents;
- Satisfaction with the implementation of professional skills increased from 72.8% to 99.0% due to the participation of employers in the training process;
- Among the necessary skills at the beginning of their career, graduates note the lack of communication skills (27.2%) and skills of organising and planning work (9.2%); there is a positive trend in this parameter when assessing professional skills from 55.6% to 63, 6%.

In general, employers gave a fairly high assessment of the real level of theoretical and practical training of graduates, which was revealed both as a result of the questionnaire and business communication within the framework of the round table. Also, employers note that the level of preparation for performing professional tasks meets the requirements of the state educational standard for vocational education. In addition to the possession of professional competencies, the merits in the preparation of graduates include the desire to work in their specialty, a high level of production discipline and a willingness to respond quickly to non-standard situations.

The main disadvantages in the preparation of graduates are associated with the insufficient level of competencies associated with new technologies. Elimination of this disadvantage is possible only on the basis of employers. In connection with the identified problems, it is necessary that:

- (1) When organising the process of mastering academic disciplines, pay more attention to solving practical problems;
- (2) Passing training practice at the employer's enterprises that have laboratories;
- (3) To increase the share of practice and acquaint students with new technologies.

In general, manufacturing enterprises responded positively to the role of internships on their basis, highlighting the effectiveness of trained personnel.

## 5. Discussion

The discussion of the conducted research is that, on the one hand, a graduate of a professional educational organisation becomes closer to the realities of the future profession, during the period of work at the internship sites, and establishes himself as a demanded specialist. On the other hand, this form of work 'obliges or gives rise to the hope that' the enterprise should recruit a trainee student. We believe that this moment should be previously agreed upon at the very beginning of the opening of the internship site. We also consider it necessary to inform the student about this.

In general, the considered model of internships for training competitive workers for high-tech industries in industrial enterprises has certain advantages over the 'traditional' state system of training specialists, which are as follows:

- Correspondence of the structure, content and volume of training of specialists to the actual needs of the enterprise;
- Use of the most modern equipment in the educational process in real production mode;
- Correspondence of the content of education to the level of production and the outlined prospects for its development (advanced learning);

- Attract highly qualified employees of the enterprise who have reached the heights of professional excellence in the educational process as teachers of vocational training;
- Immerse students in the social and corporate culture of the enterprise, which contributes to raising the status and prestige of blue collar occupations and shortens the adaptation process in the work collective;
- High efficiency of the use of funds allocated for personnel training, due to the use of modular academic programmes that reflect the needs of the enterprise (the principle of ‘teach only what is needed’).

## 6. Conclusion

The presented analytical data of the selected educational organisations served as a reason for defining them as the basis for the planned research. The pilot study covers the period from September 2020 to September 2021. During this period, mechanisms were developed for the work of internships in the system of secondary and higher vocational education. Intermediate and main results will serve as the basis for the publication of scientific works both in independent editions (monographs, methodological collections, manuals for work etc.), and participation in conferences, symposia, congresses, coverage in scientific and journalistic journals of the corresponding profile.

## 7. Recommendations

The obtained results of the study made it possible to develop a number of recommendations. Let us consider them.

1. The vocational education system must meet the needs of the regional labour market. The effectiveness of training should provide for the maximum consideration of the requirements of a particular enterprise for the training of a qualified specialist, while ensuring the formation of a range of necessary professional competencies in this specialty.
2. The mechanism of interaction for fixing the relationship is the internship sites within the framework of the approved agreements between the enterprise and the educational organisation. These contracts are concluded with educational organisations that have workshops, laboratories and the necessary equipment to provide an opportunity to master one or another professional competence of a future specialist, as well as the necessary qualified personnel for training in real production conditions, which reduces the costs and adaptation time of the future specialist.
3. The introduction of practice-oriented training of a specialist allows you to optimally use the resources of a professional educational organisation in planning laboratory practical and theoretical studies in disciplines.
4. The system of internship sites involves co-financing the regulation of training programmes for a specific workplace by enterprises interested in qualified personnel and regional authorities interested in developing the economy and raising the standard of living in the region.

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