

INFLUENCE OF INTELLECTUAL POTENTIAL ON PRODUCTION EFFICIENCY OF ROAD CONSTRUCTION ENTERPRISES

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Abstract. Problem. Based on high technologies, modern production requires the creation of powerful intellectual potential at manufacturing enterprises and at road construction enterprises as well. Its presence makes possible to implement the latest technologies in the practice of road construction, to provide the country with an extremely necessary road network of high quality. The intellectual potential of a road construction company involves not only the highly professional staff and the educational level of its employees, but also their ability to respond quickly to changing conditions of road construction machinery operation and to take adequate decisions on its management thereby achieving the maximum efficiency of work performance. **Goal.** Analyze the intellectual potential of road construction enterprises and to ground the needs and opportunities for improving its quality. **Methodology.** The article has proved the relationship between the intellectual potential of road construction enterprises and the quality of training specialists in special and higher educational institutions. The necessity of obtaining engineering knowledge of the highest level by future operators of road construction machinery is grounded. A low innovative and knowledge-intensive level of domestic road construction has been defined. The achieved degree of intellectualization of enterprises in the road construction sector can be characterized as insufficient and tending to decrease due to the insufficient level of training highly qualified specialists. The quality of training specialists of all levels does not meet modern requirements and the achieved level of manufactured machinery and technologies used in road construction. **Originality.** The article reveals the reasons of the low level of intellectual potential at road construction enterprises and the trends towards its further reduction. **Practical value.** The necessity of significant increase of the professional and educational level of workers in the road construction industry in the shortest possible period has been justified due primarily to the high degree of automation and computerization of modern road construction machinery and equipment. The ways of effective formation of intellectual potential of road construction enterprises are outlined according to the current requirements.

Key words: intellectual potential, road construction company, the level of education.

Introduction

The development of market relations objectively requires significant changes in the approaches to determine the indicators of effective industrial and technological development of enterprises in the road construction sector. The implementation of the so-called «new economy» in Ukraine, based on a high educational level and innovations, helps us to understand that the search for unused reserves and optimal ways for the effective long-term activities of road construction enterprises should be carried out in the direction of creating intellectual potential capable to generate and implement innovative ideas and developments in the road construction sphere.

Analysis of publications

The issues of intellectual activity of enterprises in modern conditions are studied in a de-

tailed way, including the development and function of the intellectual potential of enterprises in the conditions of developing the post-industrial economy. The works of many domestic and foreign scientists are devoted to the study of this key development resource. First of all we should highlight the works of I. Danyliuk [4], V. Heets [3], A. Kendiukhov [5], I. Kyrychenko [6], I. Moyseenko [7], A. Chukhno [9], Yu. Yurchenko [10] and others.

At present, a number of aspects of intellectual potential have been studied in the scientific literature, however very little research has been done on significant issues related to its development and application in the conditions of modern enterprises.

Purpose and Tasks

The objective of this article is to analyze the intellectual potential of road construction enter-

prises and to ground the needs and opportunities for improving its quality. In order to achieve the goal the following task must be solved: the methods of efficient formation of road-building enterprises intellectual potential must be developed.

Influence of intellectual potential on production efficiency

The Ukrainian economy is dominated by the industries with low technologies which can be attributed to low technology intensive industries such as mining and fuel 0.8–1 %; food processing, light industry and agricultural 1.2 %. Generally, the reproduction of the third technological structure dominates (mining metallurgy, railway transport, multi-tonnage inorganic chemistry, etc.). Therefore, almost 95 % of domestic production refers to the production of the third and fourth technological structures [1, p. 255].

The low level of the technology intensity of the national production is determined not only by the shortage of funds and the lack of motivation and benefits but also by the economy structure itself. If the existing economy structure is preserved even with an increase in GDP by 3–5 % per year, its real development is impossible to achieve since the GDP growth of 1 % requires even greater increase of costs in the existing economy structure. In order to achieve the required positive changes in the scale and dynamics of GDP growth, it is necessary to move to an innovative model of the economy restructuring, [8, p. 255]. The mentioned above refers, of course, to the road construction industry.

The achieved level of intellectual potential at the road construction enterprises in Ukraine is low. This is due to the state level factors such as the low standard of living, the insufficient funding of human development. Therefore, it led to a massive depopulation, the worsening of its quality characteristics, and some significant migration losses of the population of productive age and workers with the high professional qualification level, also to specific working conditions at road construction enterprises which occur in bad working environment during the performance of linear works, an insufficient set of modern machinery, obsolete technologies and repair facilities.

It should also be noted that the reduction of intellectual potential at road construction enterprises has affected both its general component, namely, knowledge, skills, mental habits which are acquired in the formal education system and

the specific component, such as knowledge and skills which are acquired in the process of labour activity at the workplace. If we add the distorted motivation of obtaining higher education, its relative simplicity to receive and the decreasing of the training quality of higher education institutions, it will be easy to see one of the main reasons of a considerable decline in labour productivity at road construction enterprises that is a decrease of the level (depreciation) of intellectual potential.

In case of further decrease of the level of intellectual potential we should expect a sharp decline in the competitiveness of the workforce, the machinery and the products in the road construction sector. As a result, there is a disproportion between the formal level of education (the number of personnel with higher education) and its qualitative level (the quantity and quality of the acquired knowledge). At the same time, the increase of students at higher educational institutions and the tendency to increase the proportion of the workforce with higher education shouldn't be considered as a negative phenomenon [2]. Moreover, the higher the level of education of personnel in the road construction industry, the higher the level and the shortest the possible terms of solving the complicated research, design, production and technical problems arising in the road construction engineering and production.

We shouldn't fear, even, it is necessary to welcome and encourage that a specialist with a higher education is qualified to operate modern road construction machineries. This is due to the fact that the university curricula for training mechanical engineers of road construction and machinery provide the course «Working profession». Having organized its study at a proper level, it is possible to provide training at the university level of engineer-operators of road construction machineries. The symbiosis of classical university education and professional skills of the working specialty allows, on the one hand, to fill the labor market with specialists of the highest professional level, and on the other hand, to significantly expand the opportunities for a young specialist in his/her employment after the graduation and the further career growth. The most important question is: how conscientiously, qualitatively and effectively the process of providing and perceiving knowledge takes place, how adequately the acquired knowledge is assessed at the exams, during the defense of course and diploma projects, Master's works.

The high level of qualification of the workforce of the road construction industry is required for a number of reasons. Firstly, the current level of the development of road construction machinery achieved by advanced manufacturers requires the highest engineering knowledge of its operators. Advanced road construction machinery is a sophisticated production complex equipped with electronic systems for monitoring all operational characteristics [6]. Due to the complete integration of all major electronic systems which are the basis of the «Intelligent road construction machinery» it is possible to:

1. Improve the performance characteristics of road construction machinery and reduce the probability of its failure.
2. Reduce the downtime of road construction machinery and its operating costs.
3. Improve the operational usability of road construction machinery.
4. Avoid the unauthorized operation, its usage and vandalism.
5. Reduce the time and money spent on maintenance.

Secondly, modern road construction machineries have a number of built-in electronic systems fully integrated with each other which ensures an effective exchange of data among the systems. The «electronic brain» programmes of road construction machineries are two-way communication tools which allow mechanics performing maintenance to study the diagnostic data stored in the system and quickly analyzing the most important information to adjust the parameters of road construction machinery. In addition, the software allows to:

- automatically increase the idling speed with a low battery charge;
- monitor all system parameters and warn an operator about any malfunctions by means of texting and digital messages;
- protect an engine, automatically reducing the torque and alerting an operator when a dangerous condition is detected;
- automatically adjust the position of a working element, thereby increasing the productivity of an operator and a machinery.

Therefore, only a highly professional operator with a high level of special knowledge and skills is able to manage such road construction machineries and keep them in working conditions.

Conclusions and prospects for further research

Summarizing the given studies above, we can note the following:

- the intellectual potential of road construction enterprises is determined by its features and the development factors;

- there is a correlation and mutual influence between the achieved level of the development of road construction machineries, the road construction technologies and the level of intellectual potential of road construction enterprises;

- the level of intellectual potential of road construction enterprises is determined by the degree of professional staff training, its ability to perceive innovations and to implement them, as well as the enterprise equipment with modern machines and technologies and the high production culture;

- the development of intellectual potential at the level which corresponds to the modern achievements of science and technologies in the road construction industry can be ensured by the qualitative training of engineering and technical staff on the basis of classical university training by the relevant specialty with simultaneous mastering the professional skills of the working profession.

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ВПЛИВ ІНТЕЛЕКТУАЛЬНОГО ПОТЕНЦІАЛУ НА ЕФЕКТИВНІСТЬ ВИРОБНИЧОЇ ДІЯЛЬНОСТІ ДОРОЖНЬО-БУДІВЕЛЬНИХ ПІДПРИЄМСТВ

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Анотація. Основане на високих технологіях сучасне виробництво вимагає створення на підприємствах-виробниках, у тому числі й на підприємствах дорожньо-будівельної галузі, потужного інтелектуального потенціалу. Саме його наявність дасть можливість реалізувати у практиці дорожнього будівництва найновіші технології, забезпечити країну вкрай необхідною мережею автомобільних доріг високої якості. Інтелектуальний потенціал дорожньо-будівельного підприємства передбачає не тільки високий професіоналізм і освітній рівень його працівників, але й їх здатність швидко реагувати на мінливі умови експлуатації дорожньо-будівельної техніки та приймати адекватні рішення з її керування, тим самим досягаючи максимальної ефективності виконання робіт. Обґрунтовано взаємозв'язок інтелектуального потенціалу дорожньо-будівельних підприємств і якості підготовки фахівців у спеціальних і вищих навчальних закладах. Обґрунтовано необхідність отримання майбутніми операторами дорожньо-будівельної техніки інженерних знань найвищого рівня. Визначено низький інноваційний і наукомісткий рівень вітчизняного дорожньо-будівельного виробництва. Досягнутий ступінь інтелектуалізації підприємств дорожньо-

будівельного сектора може бути охарактеризований як недостатній і такий, що має тенденцію до зниження через недостатній рівень підготовки висококваліфікованих фахівців. Якість підготовки фахівців усіх рівнів і ланок, у своїй більшості, не відповідає сучасним вимогам і досягнутому рівню техніки, що випускається, й технологій, які використовуються в дорожньому будівництві. У статті розкрито причини невисокого рівня інтелектуального потенціалу на дорожньо-будівельних підприємствах і тенденцій до його подальшого зниження. Обґрунтовано необхідність істотного, в найкоротший час, підвищення професіонально-освітнього рівня зайнятих у дорожньо-будівельному виробництві, що викликано, перш за все, високим ступенем автоматизації та комп'ютеризації сучасної дорожньо-будівельної техніки та обладнання. Намічено шляхи ефективного формування інтелектуального потенціалу дорожньо-будівельних підприємств відповідно до вимог сьогодення.

Ключові слова: інтелектуальний потенціал, дорожньо-будівельне підприємство, рівень освіти.

ВЛИЯНИЕ ИНТЕЛЛЕКТУАЛЬНОГО ПОТЕНЦИАЛА НА ЭФФЕКТИВНОСТЬ ПРОИЗВОДСТВЕННОЙ ДЕЯТЕЛЬНОСТИ ДОРОЖНО-СТРОИТЕЛЬНЫХ ПРЕДПРИЯТИЙ

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Аннотация. Основанное на высоких технологиях современное производство требует создания на предприятиях-производителях, в том числе и на предприятиях дорожно-строительной отрасли, мощного интеллектуального потенциала. Обоснована взаимосвязь интеллектуального потенциала дорожно-строительных предприятий с качеством подготовки специалистов в специальных и высших учебных заведениях. Обоснована необходимость получения будущими операторами дорожно-строительной техники инженерных знаний самого высокого уровня. В статье раскрыты причины невысокого уровня интеллектуального потенциала на дорожно-строительных предприятиях и тенденций к его дальнейшему снижению.

Ключевые слова: интеллектуальный потенциал, дорожно-строительное предприятие, уровень образования.