

~ ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ ~

УДК 37. 378

DOI:10.32680/2409-9260-2022-9-10-298-299-7-13

STUDY OF ASSESSMENT OF THE EFFICIENCY OF QUALITY MANAGEMENT IN VOCATIONAL AND TECHNICAL EDUCATION THROUGH INDUSTRY INTEGRATION

Hejun Zhao, PhD student of Sumy National agrarian university, Sumy, Ukraine Lecturer, Xinxiang Vocational and Technical College, China

e-mail: Natalystoyanets@gmail.com

ORCID: 0000-0001-8825-4803

Abstract. Vocational schools adopt the teaching mode of combining production with education, which can make teaching deeply connect with the needs of enterprises for technical and skilled talents, further improve the practical teaching quality of vocational schools, and continuously improve the education quality and students' employment quality. By effectively improving teachers' teaching ability and level, students' learning will become more effective and promote the prosperity and development of economy and society. This teaching mode of integration of industry and education emphasizes the pertinence and effectiveness of students' learning and the adaptability of future employment, so it is more in line with the needs of market economy, so as to provide strong human resources support for regional economic development and promote the efficient development of social economy. Strengthening the research on the effectiveness evaluation of the integration of industry and education in vocational education is an important measure to promote this new teaching model more efficiently. This paper deeply discusses the significance and purpose of this evaluation, puts forward the main principles of setting the evaluation, makes a preliminary design for the evaluation index system of production education integration, and puts forward the methods of evaluation and the application principles of the results. In order to build a scientific, objective and accurate evaluation mechanism, give full play to the guiding role of evaluation, and realize the linkage and innovative development of regional vocational education and industry, innovative research has been carried out, which has important guiding significance for vocational schools to carry out the integrated teaching mode of industry and education.

Key-words: vocational education, quality management, integration of industry and education, effectiveness, evaluation.

ДОСЛІДЖЕННЯ ОЦІНКИ ЕФЕКТИВНОСТІ УПРАВЛІННЯ ЯКІСТЮ В ПРОФЕСІЙНО-ТЕХНІЧНІЙ ОСВІТІ ЧЕРЕЗ ГАЛУЗЕВУ ІНТЕГРАЦІЮ

Чжао Хецзюнь, аспірант кафедри менеджменту імені професора Л.І. Михайлової, Сумський національний аграрний університет, м. Суми, Україна, лектор Сінсянський професійно-технічний коледж, Китай

e-mail: Natalystoyanets@gmail.com

ORCID: 0000-0001-8825-4803

Анотація. Метою цієї статті є дослідити як в сучасних умовах професійно-технічні школи використовують режим навчання, який поєднує виробництво з освітою, що робить викладання глибоко пов'язаним із потребами підприємств у технічних і кваліфікованих талантах, подальше покращення якості практичного викладання в професійно-технічних школах, а також постійне підвищення якості освіти та якості працевлаштування студентів. Ефективно покращуючи здібності та рівень викладання вчителів, навчання учнів стане ефективнішим і сприятиме процвітанню та розвитку економіки та суспільства. Такий режим навчання, що поєднує промисловість і освіту, підкреслює доцільність і ефективність навчання студентів і адаптивність майбутнього працевлаштування, тому він більше відповідає потребам ринкової економіки, щоб забезпечити потужну підтримку людських ресурсів для регіонального економічного розвитку сприяти ефективному розвитку соціальної економіки.

Використовується посилення досліджень щодо оцінки ефективності інтеграції промисловості та освіти в професійно-технічній освіті є важливим заходом для більш ефективного просування цієї нової моделі навчання. У цій роботі глибоко обговорюється значення та мета цього оцінювання, висувуються основні принципи встановлення оцінювання, робиться попередній дизайн системи оцінювання показників інтеграції виробничої освіти, а також висувуються методи оцінювання та принципи застосування результатів. З метою побудови наукового, об'єктивного та точного механізму оцінювання, повного відображення керівної ролі оцінювання та реалізації зв'язку та інноваційного розвитку регіональної професійної освіти та промисловості було проведено інноваційне дослідження, яке має важливе керівне значення для ППНЗ здійснювати інтегрований режим навчання промисловості та освіти.

Визначено, щоб оцінити інтеграцію промисловості й освіти науково, обґрунтовано й точно – це проблема всього світу. Звичайно, вирішення цієї проблеми також має вирішити професійна освіта в поточному процесі економічного та соціального розвитку, оскільки це визначає, чи зможе професійна освіта забезпечити підприємства людськими ресурсами

з гарантованою кількістю та якістю в майбутній висококонкурентній ринковій економіці, яка пов'язана з безперерійною реалізацією інноваційного розвитку сучасної промисловості.

Ключові слова: управління персоналом, якість управління, методичні підходи, аналіз політики, реформування освіти.

JEL Classification: O100, Q 150.

Formulation of the problem. In the process of human social civilization and economic development, technology is an important foundation to support civilization progress and social development. As an important part of modern education, vocational education has made an important contribution to the development of economy and society.

In the field of vocational education, experts and scholars have been exploring more effective forms of education so that students can better master the skills they have learned. Of course, this skill must also meet the needs of society and enterprises, create more value for employers faster, and promote their better development in enterprises and enterprises in social economy. After analyzing the demand of enterprises for technical and skilled talents in the market economy, according to the characteristics of vocational education, the industry is closely combined with the teaching of vocational schools to form mutual support and mutual promotion between enterprise production and school teaching, so as to transform the vocational schools from a single educational and teaching function to the training of technical and skilled talents. An industrial business entity integrating scientific research and service, integrating school teaching into production and enterprise production into teaching, forming a deep integration of industry and education, is an effective way for vocational schools to improve the quality of talent training.

Analysis of recent research and publications. At present, for the evaluation of the effectiveness of the integration of industry and education of vocational education, there are great differences in the evaluation methods, contents, input evaluation strength and application of evaluation results all over the world. Because there are different regional economic characteristics, the evaluation system also has its own characteristics. Generally speaking, the high-level evaluation method should adopt the combination of self-evaluation, government evaluation and third-party evaluation, but the evaluation in a considerable number of regions still lacks the third-party evaluation method, which makes the vision of evaluation limited to the perspective of themselves and the government and lacks the unique perspective of the third party. So that the conclusion can not objectively reflect the actual level of production education integration.

In addition, in terms of the content of the evaluation, the evaluation indicators mainly refer to some old index systems. These index systems can not cover the latest evaluation parameters of industry education integration. In terms of the content of the evaluation, there is a disconnection from the actual situation of current vocational education, which also leads to the deviation of the evaluation results.

In terms of the strength invested in the evaluation work, it is required that the composition of evaluation personnel should include not only experts in the field of vocational education, but also experts from industries and enterprises, and even experts specializing in the integration of industry and education. Only in this way can we establish a high-quality team with reasonable structure and can adapt to the evaluation work, and further improve the independence, self-discipline and effectiveness of the evaluation work.

From the application of the evaluation results, there are still some problems in the application of the results. The traditional evaluation results are mainly used in the formulation of enrollment plan and the allocation of school running funds, but lack the application of social and economic development, employment needs of industries and enterprises and related achievements.

Highlighting unresolved parts of a common problem. All previous studies were focused on a fragmentary study of a certain aspect of quality management of professional education and did not have a systematic analysis of assessment methods and indices. In order to achieve a good evaluation effect and emphasize the effectiveness of evaluation, it is necessary to adopt appropriate evaluation methods for different types of evaluation objects in order to ensure the authenticity, reliability and effectiveness of evaluation results.

The purpose of the article. By analyzing the teaching mode closely combined with the development of industry and vocational education, this paper scientifically puts forward the evaluation method for the new teaching mode of industry education integration, constructs the determination principle of the evaluation index system, and tries to promote the construction of a scientific, objective and accurate evaluation mechanism of industry education integration.

Methodology. This study mainly uses the literature method to review the development of appropriate quality management policies for vocational education in Chinese educational institutions. In China, in order to achieve a good evaluation effect and emphasize the effectiveness of evaluation, it is necessary to adopt appropriate evaluation methods for various types of evaluation objects in order to ensure the authenticity, reliability and effectiveness of evaluation results. The main purpose of the academic assessment and evaluation mechanism is to promote progress and

improve the quality of learning so that vocational education better serves the development of the economy and society. Finally, this study also uses a case study to analyze the evaluation methods used in several quality management practices in vocational education.

Main results of research. The significance of industry education integration teaching model. The integration of industry and teaching is a new method for vocational schools to improve the quality of practical teaching, improve the quality of education and employment rate, and enable school teaching to cultivate talents more in line with the needs of industry. [1] The significance and value of this approach can be expressed as follows:

Effectively promote economic and social prosperity and development. Industry education integrated vocational education is characterized by innovation driven and industrial transformation and upgrading. It implements the whole process of teaching according to national or local industrial development plans and needs. It is a strategic measure of vocational education reform to promote the cultivation of innovative and applied high-quality talents. It is closely related to the prosperity and development of economy and society. [2] Through the integration of industry and education, vocational schools form an industrial business entity with both technical and skilled talent training ability and scientific research and service ability, which will drive and promote the progress and upgrading of industry and promote more prosperity and faster development of economy and society.

Effectively promote the development of Vocational Education. The goal of vocational education is to cultivate technical and skilled talents needed by enterprises in production, management and service. Therefore, it is necessary to refer to the needs of social and economic development for talents, scientifically and reasonably build a professional curriculum system consistent with the requirements of the industry, and cultivate talents who meet the needs of enterprises. [3] They must have the corresponding knowledge and ability in the field of a profession or type of work, and have the quality required by enterprise production. The teaching mode of industry education integration integrates school teaching and enterprise needs. In the operation of this teaching mode, enterprise experts participate in the setting of training objectives, the design of teaching plans and the implementation of teaching process. [4] In this mode, the knowledge and skills learned by students are the knowledge and skills needed to work in enterprises in the future. They are highly targeted, widely recognized by enterprises and play an obvious role in promoting the development of vocational education.

Effectively improve teachers' teaching ability and level. The teaching mode of integration of industry and education requires teachers to be familiar with the skill requirements, equipment status, production process, industrial frontier, etc. of their major in production enterprises, so that in enterprises relying on different majors, they can impart the knowledge and skills closely combined with production practice to students. [5] These knowledge and skills may exceed the original ability of teachers, so teachers must constantly improve their ability and literacy from the perspective of production practice, so as to meet the teaching requirements of the integration of production and education. At the same time, it also requires that the school must cultivate a teaching team that can combine production and teaching, teaching and scientific research, so as to be competent for the teaching requirements of the integration of production and education. [6]

Effectively improve students' learning effectiveness. Under the teaching mode of integration of industry and education, vocational schools integrate school teaching with enterprise production. By setting up professional industries, they can provide students with a learning environment based on real production conditions. Learning in such an environment makes it easier for students to combine theoretical knowledge with practice, improve their ability to apply what they have learned in production, find and solve problems, and strengthen students' innovative application ability. [7] Secondly, in the teaching mode of integration of industry and education, students can get some reward for participating in production or operation, which further stimulates students' learning enthusiasm, enhances their sense of achievement, urges them to study knowledge and skills harder in future learning, and constantly reform and innovate in practice, which makes learning more effective. [8]

The integrated teaching mode of industry and education emphasizes the pertinence and effectiveness of students' learning and the adaptability of future employment, so it is more in line with the needs of market economy and can play a strong supporting role in the rapid development of social economy. [9]

Evaluation on the effectiveness of production education integration teaching model. The integration of industry and education is a new teaching mode in vocational schools. Its function is to integrate knowledge theory and practice, fully stimulate students' interest in learning, and then improve the quality of teaching. [10] Due to the great differences in the school running characteristics of various vocational schools and the great differences in the external environment such as the regional economic development and industrial layout of the schools, each school also has its own different practices in the practice of the production education integration teaching mode according to local conditions. In order to evaluate the teaching effectiveness of different

methods, there must be a set of evaluation mechanism to scientifically evaluate the teaching effect of each school. On the basis of educational science and effective achievements, we try to find a method to accurately evaluate the teaching effect of this new teaching model from the perspective of management. The following is our research.

Significance and purpose of evaluation. The integration of industry and education is a new teaching model, which is different from the previous cooperation between schools and enterprises. In contrast, the integration of industry and education has the connotation of improving the comprehensive level of vocational education. Students can fully communicate what they have learned and what they want with enterprise technicians, carry out learning under the guidance of enterprise technicians, and play the role of enlightening thinking and developing ideas. [11] Therefore, the scientific and accurate evaluation of this new teaching model is of great significance in the teaching management of ensuring the teaching effect and avoiding directional errors. At the same time, scientific and accurate teaching evaluation can dig out some schools with good practices, so that those schools that are still confused or have no way can learn valuable experience, so that all kinds of vocational schools can promote the integration of industry and education as soon as possible, achieve excellent teaching results, and highlight the contribution of vocational schools to social and economic development.

Determination principles of main evaluation indicators. Evaluation index is a specific index specially designed for evaluation content, so as to reveal the degree of realization of evaluation content. [12] Because the teaching mode of industry education integration involves a wide range and has a high degree of complexity, it is necessary to set three-level indicators for evaluation. When determining the evaluation indicators, the main principles to be considered are:

The evaluation index is representative of the overall situation. This principle requires that the evaluation indicators not only comprehensively reflect the level and degree of the integration of industry and education in a school, but also not too many indicators. Select the representative indicators in the comprehensive evaluation, so as to avoid the complexity of the evaluation indicators and affect the efficiency of the evaluation.

The principle of combining qualitative evaluation with quantitative evaluation. Compared with qualitative evaluation, quantitative evaluation has the characteristics of accuracy and less subjective influence. However, due to the complexity of industry education integration, only quantitative evaluation can not accurately and comprehensively evaluate the level of industry education integration in a school. For example, qualitative evaluation is more convenient and accurate for the evaluation of enterprise popularity. Of course, too much qualitative evaluation will also cause the problems of vague evaluation results and insufficient accuracy. Due to the above factors, we believe that setting the ratio of qualitative evaluation to quantitative evaluation at 2:8 can better achieve the purpose of evaluation. [13]

Principles of data reliability and availability. Scientific and accurate evaluation results come from the authenticity of data, which must have absolute reliability. At the same time, these data must also be available to us, which is the guarantee of authenticity. The data fabricated out of thin air does not have any scientific significance, so when setting evaluation indicators, we must pay attention to the channels to obtain real and reliable data. Only in this way can these evaluation indicators be operable.

The principle of combining dynamic evaluation and static evaluation. For the evaluation of industry education integration, the input and output in this field must be considered, so this process mainly evaluates the sustainable development of industry education integration and the output of social benefits. Therefore, only static evaluation is not enough. It is also necessary to introduce dynamic evaluation into the index system in order to make a better scientific, reasonable and accurate evaluation.

The principle of combining commonness evaluation and individuality evaluation. Because there are great differences in the economic basis, industrial characteristics and talent market demand of the region where the vocational school is located, the evaluation of the individual practices implemented by the vocational school according to the regional characteristics must be considered in the process of setting the evaluation indicators. The evaluation of individual practice can be based on the actual investment, the promotion of teaching quality, the generated social benefits and values, so as to encourage vocational schools to blossom and birds contend on the road of production and education integration, and produce better results.

Integrate big data technology evaluation mechanism. Through big data technology, we can easily deal with the practical problems such as lack of standards, loss of objectives and lack of value in the process of production education integration quality evaluation, so as to promote the whole process, accuracy and information management of quality evaluation. [14] Under the thinking of big data, clarify the connotation and characteristics of data governance of industry education integration quality evaluation of vocational education, reveal the evolution of data governance form of industry education integration quality evaluation of vocational education, and explore the realization path of data governance of industry education integration quality evaluation of

vocational education, It is of great practical significance to explore the theoretical construction and practical exploration of the data governance system of industry education integration quality evaluation of vocational education. [15]

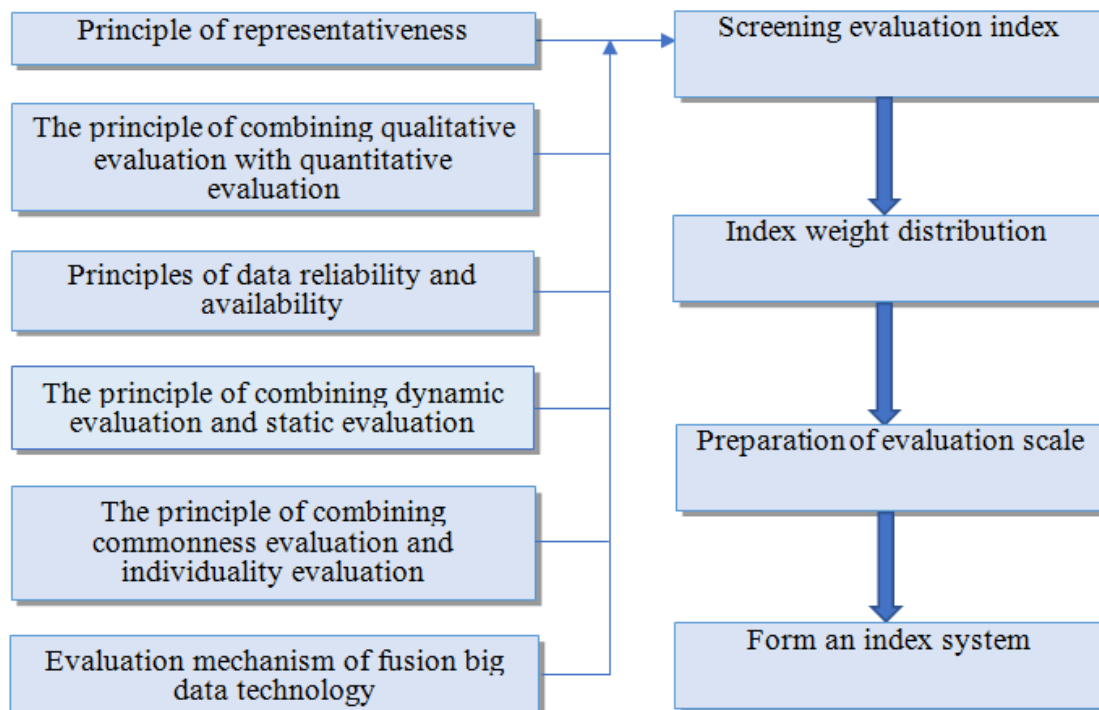


Figure 1. Construction diagram of industry education integration index system

Source: prepared by the author

According to the above principles, the index system of industry education integration evaluation can be preliminarily designed. Of course, when designing the index system, we also need to refer to a large number of policies and regulations, conduct special research and visits for Vocational Colleges and their leaders in different regions, and distribute the weight of different types of indicators, so as to truly establish a complete evaluation index system (see Figure 1).

Assessment method. There are many different evaluation methods in the field of vocational education evaluation all over the world. Objectively speaking, each method has its own advantages and disadvantages, and each method also has different applicable environments and occasions. In order to achieve good evaluation effect and highlight the effectiveness of evaluation, appropriate evaluation methods need to be adopted for different types of evaluation objects in order to ensure the authenticity, reliability and effectiveness of evaluation results.

The effectiveness evaluation of industry education integration is a complex system. It involves not only quantitative, qualitative, linear and nonlinear evaluation, but also some subjective evaluation and evaluation uncertainty. Therefore, only using a single evaluation method can not meet the reliability requirements, which requires us to build a variety of scientific and objective methods to make an objective, real and reasonable evaluation of the integration of industry and education in a vocational college, To ensure the effectiveness of the evaluation.

Assessment results and use. The main purpose of scientific assessment and evaluation mechanism is to promote the progress and improvement of teaching quality, so as to make vocational education better serve the development of economy and society.

Generally speaking, the assessment results can be divided into five grades: excellent, good, qualified, basically qualified and unqualified. The evaluated school can find its own shortcomings in different dimensions such as the guiding ideology of running a school, the organization and development process of teaching, the conditions and investment of running a school, the mode and characteristics of running a school, and the social benefits obtained by running a school according to the results of its own school evaluation, And as a reference for the change intention of leadership behavior, so as to clarify the direction of improvement and efforts in the next step, gradually establish and improve the direction and mechanism of school development according to the scientific concept of vocational education, and continuously improve the teaching quality and school running efficiency. [16,17]

Of course, the results of the evaluation give hints to local governments to pay attention to

vocational education and boost the level of regional economic development, which can promote local governments to create a vocational education development environment and space more in line with the idea of integration of industry and education, so as to promote the simultaneous development of various undertakings in the whole region.

Conclusions. It is a worldwide problem to evaluate the integration of industry and education scientifically, reasonably and accurately. Of course, to solve this problem is also what vocational education must solve in the current process of economic and social development, because it determines whether vocational education can provide enterprises with human resources with guaranteed quantity and quality in the future highly competitive market economy, which is related to the smooth realization of the innovative development of modern industry.

The integration of industry and education is the development direction of vocational education teaching mode. To ensure the correct direction in this direction, it is necessary to have a scientific, objective and accurate evaluation mechanism, so as to give full play to the guiding role of evaluation and make the evaluation more effective. Under the scientific evaluation mechanism, schools and relevant government departments can find the existing problems in time and continuously improve and improve the work quality, So that vocational education can better combine the development needs of regional advantageous industries, realize the linkage and innovative development of regional vocational education and industries, strive to cultivate skilled talents, form a new model of innovative talent training, and make more contributions to continuously improving the economic level.

At present, there are still great differences in the research on the evaluation system of the integration of industry and education all over the world, and there are still some objective cognitive gaps in the evaluation mechanism, such as how to determine the evaluation standard, how to determine the evaluation index, how to measure the index weight, how to implement the evaluation method, etc. we need to continue to invest a lot of energy in research, and finally form a set of scientific Objective and accurate evaluation mechanism of industry education integration.

References

1. Yang Jian & Liu Xiangjie. (2021). Research and practice of practical teaching quality evaluation system in Higher Vocational Colleges Based on the integration of industry and education. *Neijiang science and Technology* (08), 129-131. Doi: CNKI: SUN: KJNJ. 0.2021-08-070
2. Lang Yongfeng. (2021). The practical dilemma of triple helix theory and the integration of industry and education. *Journal of Heilongjiang Institute of Teacher Development* (09), 11-13. Doi: CNKI: SUN: HLJB. 0.2021-09-004
3. Zhou Xin. (2021). Research on the construction of "OBE" concept based on the integration of industry and education in the curriculum system of international trade. *Shanxi youth* (17), 57-58. Doi: CNKI: SUN: SXQS.0.2021-17-027
4. Yang, W. . (2019). Research on the High-quality Development of Vocational Education Based on the Integration of Industry and Education.
5. HUANG, & Han-yu. (2021). Construction of emerging business education in vocational colleges from the perspective of integration between industry and education. (2018-3), 229-235.
6. Wang Yongli, Li Yong & Yang Jihong. (2021). Empirical Study on the construction path of "double qualified" teachers in Higher Vocational Colleges under the background of industry education integration. *Modern vocational education* (38), 126-127. Doi: CNKI: SUN: XDZJ. 0.2021-38-061
7. Lai Dongyin, Wu Qi, Liang Yiming, Huang Hao & Wang Hao. (2021). Innovation and practice of collaborative education mode of industry education integration of Mechatronics specialty -- taking improving students' innovation and entrepreneurship ability as an example. *Use and maintenance of agricultural machinery* (09), 101-103. Doi: 10.14031/j.cnki.njwx.2021.09.049
8. Li Yunsong, Lu Shan & Zhang Guofeng. (2021). Research on effective ways of school enterprise collaborative education through the integration of industry and education in higher vocational education. *Vocational Technology* (10), 72-76. Doi: 10.19552/j.cnki.issn1672-0601.2021.10.013
9. Lin Xianxin, Su Xi, Li Xi & Lin Dezhi. (2021). Discussion on the teaching reform of deepening the integration of industry and education based on the mechanical specialty in Higher Vocational Colleges -- Taking Guangxi electromechanical vocational and Technical College as an example. *Light industry science and Technology* (10), 152-154. Doi: CNKI: SUN: GXQG. 0.2021-10-065
10. Xie Yuanshan & Yu Yang. (2021). Research on the development mechanism of industry education integration in Higher Vocational Colleges under the background of the new era. *Modern vocational education* (38), 158-159. Doi: CNKI: SUN: XDZJ. 0.2021-38-077
11. Guo Hua (September 10, 2021). Deepening school enterprise cooperation and promoting the integration of industry and education. *Yuncheng daily*, 002

12. Chen Xiaolan, Luo Zhuhua & Liu Yong. (2021). Building an evaluation system for the integration of industry and education: elements, problems and strategies. *Science and technology style* (22), 151-152 + 164. Doi: 10.19392/j.cnki.1671-7341.202122067
13. Wang, J. . (2015). Perfecting the mechanism of the scientific incentive methods of vocational colleges based on the quantitative evaluation. *Journal of Beijing Institute of Economics and Management*.P.35-43.
14. Wang, H., He, Z., Ji, J. , & Chen, J. . (2020). An Analysis on Paths of Promoting the Construction of Modern Vocational Education System by Educational Informatization. 2020 IEEE 2nd International Conference on Computer Science and Educational Informatization (CSEI). IEEE.
15. Li Bin & Hu Kun. (2021). Data governance for quality evaluation of production education integration in Higher Vocational Education: connotation characteristics, morphological evolution and realization path. *Education and occupation* (16), 48-54. Doi: 10.13615/j.cnki.1004-3985.2021.16.007
16. Cheng, T. F. , & Wu, H. C. . (2020). A follow-up study on vocational high school principals' opinions about 360 degree evaluation feedback and their leadership effectiveness and behavior change. *Asia Pacific Education Review*, 21(1), 65-81.
17. Zhao, H., Stoyanets, N., Cui, L., & Li, G. (2022). Strategy of vocational education adapting to social and economic development. *Journal of Innovations and Sustainability*, 6(1), 03. <https://doi.org/10.51599/is.2022.06.01.03>

Стаття надійшла до редакції 15.10.2022

Прийнята до публікації 20.10.2022