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## THE ROLE OF THE SYSTEM OF ORGANISATIONAL KNOWLEDGE IN THE DEVELOPMENT OF COMPETENCY-BASED TRAINING OF INDUSTRIAL EMPLOYEES

*The role of on-the-job training in increasing the competitiveness of the country and knowledge economy formation is described in the paper. Comparative analysis of advantages and disadvantages of competency-based training is carried out. Significance of the system of organisational knowledge in the improvement of this form of training is justified.*

*Keywords: competency-based training; organisational knowledge; industrial employees.*

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## РОЛЬ СИСТЕМИ ОРГАНІЗАЦІЙНИХ ЗНАТЬ У РОЗВИТКУ КОМПЕТЕНТНІСНО-ОРІЄНТОВАНОГО НАВЧАННЯ ПРАЦІВНИКІВ ПРОМИСЛОВОСТІ

*У статті висвітлено роль навчання працівників на робочому місці в підвищенні конкурентоспроможності країни та створенні економіки знань. Проведено порівняльний аналіз переваг та недоліків компетентнісно-орієнтованого навчання. Обґрунтовано значення системи організаційних знань в удосконаленні даного виду навчання працівників промисловості.*

*Ключові слова: компетентнісно-орієнтоване навчання; організаційні знання; працівники промисловості.*

*Рис. 4. Табл. 1. Літ. 36.*

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## РОЛЬ СИСТЕМЫ ОРГАНИЗАЦИОННЫХ ЗНАНИЙ В РАЗВИТИИ КОМПЕТЕНТНОСТНО-ОРИЕНТИРОВАННОГО ОБУЧЕНИЯ РАБОТНИКОВ ПРОМЫШЛЕННОСТИ

*В статье освещена роль обучения на рабочем месте в повышении конкурентоспособности страны и создании экономики знаний. Проведен сравнительный анализ преимуществ и недостатков компетентностно-ориентированного обучения. Обосновано значение системы организационных знаний в усовершенствовании данного вида обучения работников промышленности.*

*Ключевые слова: компетентностно-ориентированное обучение; организационные знания; работники промышленности.*

**Introduction.** The development of economies all over the world today lies in the creation of knowledge-based economies. The key role in this process belongs to skilled workforce that meets the needs of the labor market and is the engine of socio-economic progress and competitiveness rise of countries as a whole. In turn, the qualification level of workforce is determined by efficient functioning of the system of vocational education and training (VET) and its components. According to C.A. Anane (2013) "in today's knowledge driven and competitive global economy, technical/vocational education is the fundamental element in the development equation because it allows individuals and societies to unlock their potential, expand their horizons and adapt to the changes in the dynamic world". Special attention should be given to the problems of VET of industrial workers as industry is the leading branch

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in any economy. The experience of developed countries has demonstrated the benefits of vocational on-the-job training (OJT), which is closely connected with such type of learning as competency-based training (CBT). The latter has many advantages as well as convey certain disadvantages.

The current research is dedicated to the development of VET for employees taking into account the organizational context in which their competencies will be useful. The experts of Australian National Training Authority (ANTA, 2003) noted that "education and training sectors need to create programs and practices that lead to more work-conducive learning. This kind of learning is often not guided by pre-specified content; it is context-driven by specific and immediate work requirements and ... learning that occurs at work is facilitated by a number of people in the workplace". The development of the systems of organisational knowledge (SOK) at industrial enterprises will allow taking into account the impact of organisational context for planning CBT. These are the systems which form the basis for the formation of organisational competences, and, in turn, determines those competencies which industrial employees should have.

**Literature review.** There is no coherent understanding of the nature of knowledge economy (or knowledge-based economy). The very idea of knowledge economy belongs to F. Machlup (1962) which meant by the latter one of the sectors of economy. By definition of the OECD (1996) knowledge economies are understood as "economies which are directly based on the production, distribution and use of knowledge and information". Thus, knowledge plays the key role in the development of this type of economy. Knowledge does not exist by itself. It is always associated with certain carriers. These carriers can be personalized (individual employees, work teams, groups) and nonpersonalized (databases, corporate information systems, hardware and software, all types of documents). Despite a wide range of possible varieties of knowledge carriers, it should be noted that the primary role is played by personalized carriers. The leading contribution to knowledge, needed for economic development, belongs to employees. Scientific literature provides various interpretations of it.

There is a perception that "knowledge economy is not so much concerned with higher skills as with the needs of business enterprises for a broad range of general aptitudes, abilities and skills that can be applied to the increasingly cognitive demands of jobs and the new ways of thinking and managing" (CRRI & CRLRA, 2000). This definition emphasizes the necessity not only to build competencies by employees but to bring them in line with labor market requirements. The focus is on the adaptability of professional knowledge to organizational context and its changes. Especially important for our further discussion is the indication of changes in workers' ways of thinking. The Work Foundation's report highlights that "workforce as a whole is becoming more skilled, partially as a result of technological advances, in terms of formal qualifications and acquired experience within jobs" (Brinkley et al., 2009). Similar opinion is shared by D. Coats (2005) who believes that the necessary component of knowledge economy is "high skilled workforce ... although it is obviously important to ensure that all workers have basic skills too".

The term "knowledge worker" introduced into the scientific debate by P. Drucker is inextricably linked to the prospects of knowledge economy development. Much

attention to this issue is paid by H. Timonen and K. Paloheimo (2008). Traditionally, scientists have believed that the category of "knowledge workers" include the representatives of such fields of activity as scientific work, software development, accountancy, consulting etc. There is evidence that "manufacturing sector relies on the knowledge work of all employees, not just managers, professionals and para-professionals" (ANTA, 2003). Another study shows that "knowledge economy is ... dependent upon all of its workers and not just the few who engage in the highest level of specialist tasks" (Brinkley et al., 2009).

These statements confirm that the issue of intensive development of professional knowledge became relevant not only for high-tech industries but also for all other economic sectors. In addition to that, this research is also aimed at studying various forms of vocational training (VT) as a tool of professional knowledge development.

K. Rudiger and A. McVerry (2007) noted that "when we assess the impact of investment in knowledge with regards to workers, i.e. education, it is worthwhile to point out that this does not only include formal education. On the contrary, those countries who have done well in terms of knowledge work have invested a lot in adult education and learning on the job". So, various forms of vocational training are connected to practical activities of industrial workers. This study pays special attention to such forms as on-the-job training (OJT) and competency-based training (CBT).

**The purpose of this article** is to justify the role of SOK in the process of vocational CBT for industrial employees.

**Research methodology.** This study uses the method of scientific literature analysis to highlight the advantages and disadvantages of CBT and its relationship with such type of training as OJT. To justify the benefits of OJT and its role in the development of knowledge-based economies we used the correlation analysis method implemented by means of "Statistica 10.0". We determine the presence of a significant correlation between the values of indicators such as On-the-job training (OJT), Global Competitiveness Index (GCI), Knowledge Economy Index (KEI) which values are analyzed for 2006–2012 for the EU member states and also for Ukraine. The statistical data of The State Service of Statistics of Ukraine, the World Economic Forum and the World Bank are used as the information base for the study.

**Key research findings.** A common feature of OJT and CBT is their practical orientation. By definition of T.R. Wilson, J.A. Olmstead and R.C. Trexler (1980) OJT is "a training process that takes place primarily on the job during actual production operations". S. Wood (2004) highlights the following benefits of OJT: customised pace; incidental learning, encompassing real work experiences which lie outside formal training components; learning that is relevant to enterprise and individual needs; and identification of employment opportunities for trainees and employers.

To study the effectiveness of this form of training as OJT, as well as its impact on the development of the economies of various European countries, we study the correlation between the following indicators: On-the-job training (OJT); Global Competency Index (GCI); Knowledge Economy Index (KEI). The statistical data of the World Bank (KEI) and the World Economic Forum (GCI & OJT) for 2006–2012 became or information basis.

The data was analyzed for the old EU members and Ukraine. The results of the correlation analysis as a correlation matrice are shown in Figure 1.

	GCI	OnJT	KEI
GCI	1.00	<b>0.93</b>	<b>0.92</b>
OJT	<b>0.93</b>	1.00	<b>0.86</b>
KEI	<b>0.92</b>	<b>0.86</b>	1.00

Figure 1. **Correlation matrix (results of correlation between OJT, GCI and KEI)**, calculated by the author on the basis of the World Economic Forum and the World Bank data

We found the statistically reliable correlations ( $p < 0.05$ ) at the level: 0.93 for OnJT-GCI; 0.86 for OnJT-KEI. As it can be seen in Figure 1, the levels of correlation between the studied indicators are quite high. This once again confirms the effectiveness of such type of training as OJT.

In Ukraine, the VET of workers can occur directly in the workplace or at education institutions. Figure 2 shows the relevant data.

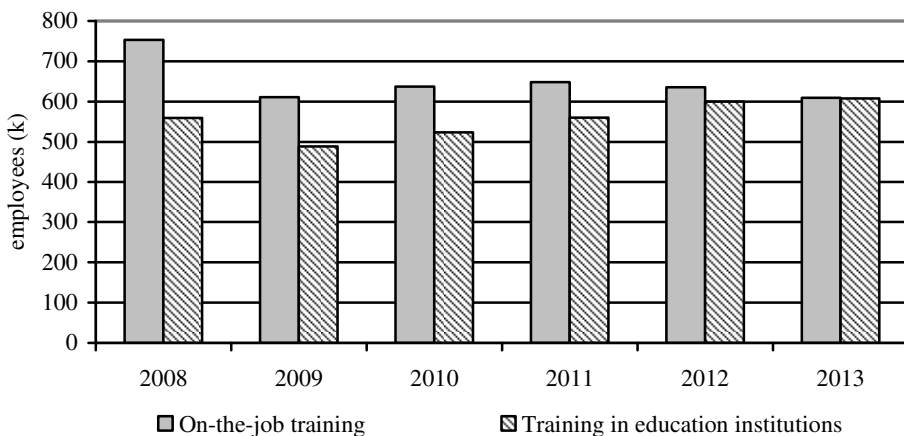


Figure 2. **Dynamics of VET of workers in Ukraine**, constructed by the author on the basis of The State Service of Statistics of Ukraine data

In Ukraine the number of employees undergoing training and professional development in the workplace exceeds the corresponding number at education institutions. The tendency to equalize these two forms of VT can be seen for the last couple years. As for the quantitative relations of these types of VT in industry, they are characterized by more significant use of such form of training as OJT (Figure 3).

The prevalence of OJT for employees' training is typical for the industry in Ukraine. This makes it necessary to pay special attention to CBT characterized by a significant component of OJT. From the point of view P.B. Kaaya (2012) "enterprises are also very positive about the increased level of on-the-job learning. CBET facilitates this by reducing the time out that off-the-job training and education entails". The study of strengths and weaknesses of CBT and possible ways of improving it can promote further widespread introduction of this form of VT for industrial employees in Ukraine.

The definitions of CBT differ in the interpretation of their essence by various authors. Its main feature is considered to be the emphasis on practical significance of training results and not training duration. Thus, Australian Chamber of Commerce and Industry defines CBT as "a way of approaching (vocational) training that places

primary emphasis on what a person can do as a result of training (the outcome), and as such represents a shift away from the emphasis on the process involved in training (the inputs). It is concerned with training on industry-specific standards rather than on individual achievements relative to others in a group" (ACCI, 1992). C.A. Anane (2013) meant by CBT "an industry and demand driven (outcomes-based) education and training programme based on well defined industry generated standards (occupational standards)". Paying attention to the study of the nature of CBT researchers often consider this form of VT in the context of its importance for industry.

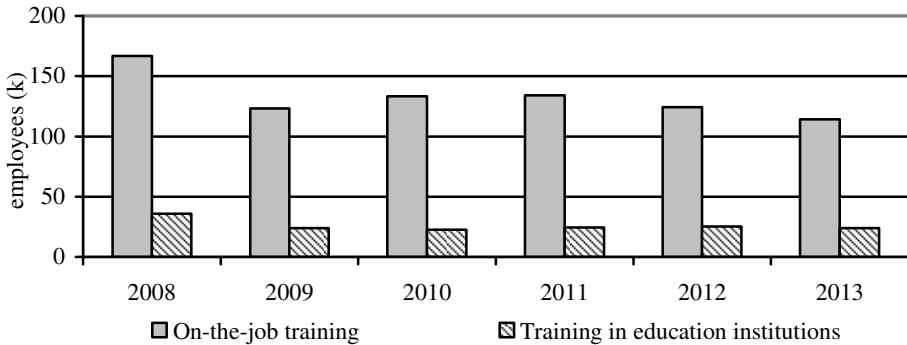


Figure 3. **Dynamics of VET of industrial workers in Ukraine**, constructed by the author on the basis of The State Service of Statistics of Ukraine data

Unfortunately, Ukraine has no broad practice of CBT use. Therefore, it is advisable to refer to the experience of the countries where this type of VT was widely used. The results of this experience are the works highlighting the advantages and disadvantages of CBT given in Table 1.

As it can be seen in Table 1, despite the significant advantages of CBT, this type of VT has certain disadvantages. The more comprehensive approach to VT at industrial enterprises which combines both the benefits OJT and the advantages of CBT will allow compensating for the disadvantages.

According to F. Blackler (1995) "as an alternative to focusing on the kinds of knowledge that capitalism currently demands, attention should focus on the systems through which knowing and doing are achieved". These are SOK, the formation and development of which will compensate for the abovementioned disadvantages of CBT. The basis of SOK is related to carriers (personalized or non-personalized) of organizational knowledge and the relationships between them.

It is a widely accepted that professional knowledge of employees is one of the main components of their professional competences. The author comes from the statement that organizational knowledge forms the basis for the formation of organizational competencies. Organizational competencies are mentioned in the works of F. Selznick (1957), I. Ansoff (1965), K. Prahalad and G. Hamel (1990). From the point of view K. Prahalad and G. Hamel (1990), "core competencies are the result of collaborative learning of the organization, especially in coordinating various production skills and integrating various technologies".

In addition to core organizational competencies modern researchers (Várlamova, 2009; Katunina, 2010; Kuznetzova and Chopovda, 2010) also distin-

guish organisational competences of lower level. This study suggests to call these competencies the basic ones. They are the set of competencies necessary for business operation, ensuring its presence at market, the ability to solve routine daily tasks but do not provide competitive advantage and do not allow company take leading positions.

*Table 1. Comparative analysis of advantages and disadvantages of CBT, author's compilation from publications*

<b>Advantages of CBT</b>	<b>Disadvantages of CBT</b>
A bridge between the industry clients and the providers of VET. Competency standards have been an enduring means of articulating industry training requirements, thereby increasing the relevance and job specificity of VET (NCVER, 1999).	The absence of substantial underpinning theory components, i. e. aspects of effective lifelong learning, lower standards and “dumbing down” when the need is for broader thinking and understanding of complex workplace skill and management issues (Cornford, 2006).
Effective in providing specific, predominantly technical skills, procedural knowledge and capacities for routine problem-solving, the ability to handle frequently recurring routine tasks (Mulcahy & James, 1999).	Less effective in providing broad-based behavioural skills, conceptual, tacit and experiential knowledge, ability to use existing knowledge in new ways and new solutions (Mulcahy & James, 1999).
Highly valued for its instrumental, job-specific characteristics at enterprises (NCVER, 1999).	Less successful in providing training for workforce innovation and does not provide for learning of a non goal-based kind where problems are set as well as solved (NCVER, 1999)
Focuses up the importance of institutional links: between industry and education; economy and education; governments and education; labour markets and training (Mulcahy, 2000).	A course may be classified as competency-based, but unless specific CBT materials and training approaches (e.g., learning guidelines, checklists and coaching) are designed to be used as part of CBT approach, it is unlikely that the resulting course will be truly competency-based (Kaaya, 2012).
Lends itself well to the development of skills that have a clear and specific content (e.g., operational skills, technical skills) (Mulcahy, 2000).	Lends itself less well to the development of skills that emphasise relationships and processes (e.g. entrepreneurial skills, knowledge-creating skills) (Mulcahy, 2000).
Training time is used more efficiently and effectively as the trainer is a facilitator of learning as opposed to a provider of information (Norton, 1987).	Unless initial training and follow-up assistance is provided for trainers, there is a tendency to “teach as we were taught” and CBT trainers quickly slip back into the role of traditional teacher (Norton, 1987).
More training time is devoted to working with participants individually or in small groups as opposed to presenting lectures and evaluating each participant’s ability to perform essential jobskills (Norton, 1987).	CBT course is only as effective as the process used to identify competencies. When little or no attention is given to identification of essential job skills, then the resulting training course is likely to be ineffective (Norton, 1987).

Closely related to the research of core competencies is the concept of dynamic capabilities of organization. D.J. Teece, G. Pisano and A. Shuen (1997) define dynamic capabilities as “potential of a firm in integrating, creating and reconfiguring internal and external competencies according to rapidly changing environment.



Dynamic capabilities reflect the potential of organisation to achieve new and innovative advantages". Following the above definitions of core and basic organisational competencies and dynamic capabilities, the author considers it appropriate to distinguish the following types of organisational knowledge:

- basic organisational knowledge (this knowledge makes up the basis of core organizational competencies that allow the enterprise work in the branch but does not provide significant competitive advantages);
- core organisational knowledge (the basis for core organizational competencies and a specific synergistic combination of all knowledge in the organization and also new knowledge that provides significant competitive advantage for enterprises);
- organisational metaknowledge (knowledge about knowledge, that is where you can quickly gain necessary knowledge, as well as how to generate, store, disseminate knowledge in organizations and quickly respond to changes in external and internal environment; it is the basis for dynamic capabilities of enterprises).

As noted above, the success of CBT largely depends on proper identification of enterprises needs and the industry. In Ukraine, it requires close collaboration with employers, identification of their needs in industrial workers who have certain professional competences. Often, employers put different meanings in the same names of competencies depending on a field of activity. The process of implementation of each competency has peculiar features within at enterprise. Moreover, professional competences of industries workers are not static. They are constantly modified under the influence of external and internal environment. So, curricula should be modified. An important prerequisite for effective CBT is the correct setting of training objectives. It is possible if Ukrainian enterprises and their management will have a clear understanding what organizational competences for their enterprises are core, basic and dynamic ones. Therefore, it is advisable for Ukrainian industrial enterprises to form SOK. The latter could become the basis for efficient wide implementation of CBT in industries of Ukraine and compensate for its disadvantages.

The role of SOK lies in the fact that it provides clear definition of various types of skills, knowledge and habits of industrial employees. Having a clear idea of what organisational competences are basic, company's management can formulate the needs for workers with certain individual professional competences. The list of such competencies, as outlined above, is an input information for organisations conducting CBT. Partly existing practices of CBT can provide the formation of those professional competences of employees which form the basis for core organisational competencies. This type of VT does not involve the formation of such skills as creativity and developing innovative approaches to problem solving. These skills are formed through other types of VET. The basis of organisational metaknowledge, and thus dynamic capabilities of enterprise is formed by adaptability and flexibility of employees and their ability to quickly rebuild the usual methods of action, the ability to predict the consequences of their own professional activity. According to various studies cited above, these skills are not formed by the existing systems of CBT. For this purpose we use other forms of training. Figure 4 shows the hypothetical relationship between SOK and CBT.

The advantage of the formation and development of SOK at industrial enterprises is that they provide the foundations for learning organizations and knowledge-

creating enterprises. Development of organizational knowledge contributes to the systematization and revision of existing knowledge at enterprises, creation and dissemination of new knowledge, the separation of the types of knowledge that form the basis of basic and core organizational competencies and dynamic capabilities. All these processes involve active participation of workers, sharing experience and learning from each other. According to M. Tomassini (2000) "approaches such as the knowledge-creating company and communities of practice help to establish the learning paradigm as a necessary step from the teaching paradigm to the training of employees". Creation of SOK is a new philosophy of continuous vocational training in the workplace which is competency-oriented. At the same time it lacks the disadvantages of traditional form of CBT.

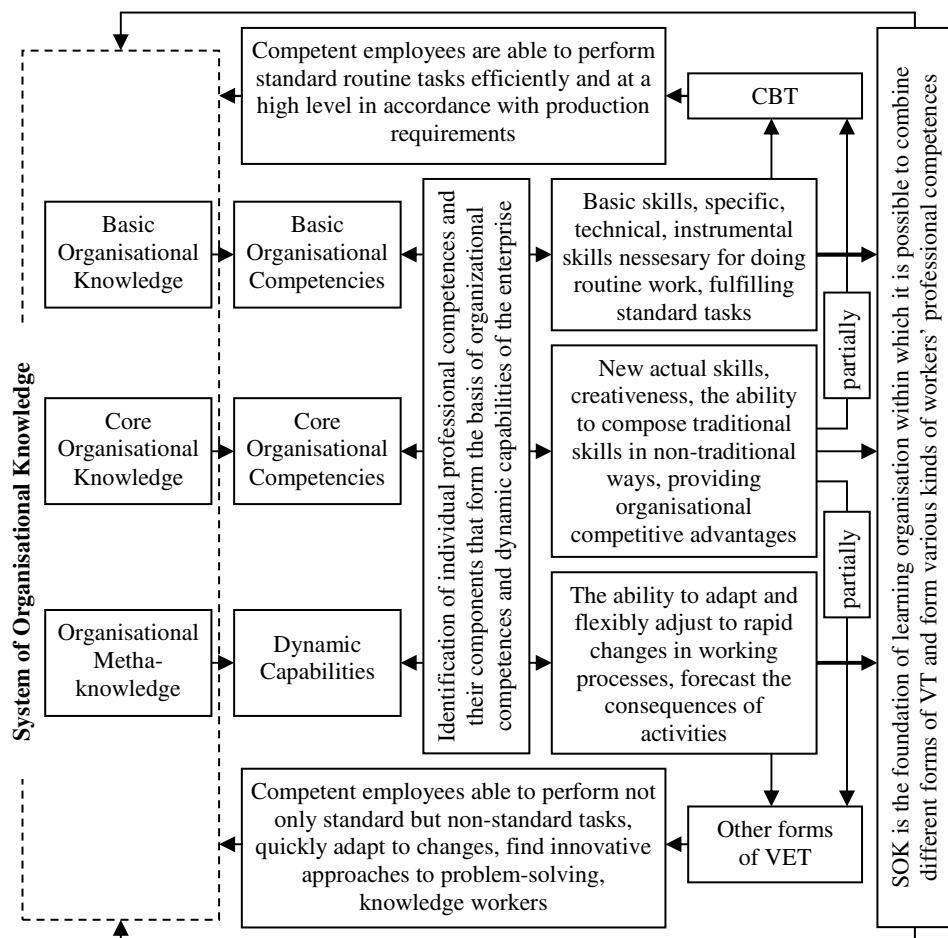


Figure 4. Integration of SOK and CBT in the process of VET, elaborated by the author

D. Mulcahy (2000) argues that "it is a matter of establishing a new cultural order of educational practice, an order that operates within conditions set elsewhere (government, industry, the economy)". From the point of view of E. Wenger (1998), prac-



tice is the most valuable learning resource available to organisations. Similar argument is presented in the report of Australian National Training Authority (ANTA, 2003), which says that the most important knowledge for performing professional tasks is "rarely codified in text books, formal training programs, competency standards, or procedural manuals ... it is developed within the context and environment of the immediate workplace from the base of relevant skills and knowledge, including technical knowledge, held by workers". Engaging employees in the formation and development of SOK not only creates conditions for their continuing VT but also provides the organizational context for this training. Simultaneously, more profound understanding by employees of enterprise objectives, its priority directions of activities take place.

**Conclusion.** The role of SOK in the process of continuous VT of industrial employees in Ukraine is justified in this paper.

The correlation analysis of such indicators as OJT, GCI and KEI proved the essential relationship between intensity of OJT, the level of competitiveness of the country and development of knowledge economy. Such interconnection justifies paying special attention to those forms of training industry employees which are linked to professional activity. One of such training forms is CBT. The paper deals with comparative analysis of advantages and disadvantages of this form of training. As a result of this analysis the author suggests the conclusion that CBT disadvantages may be compensated by the development of SOK at industrial enterprises. Development of SOK at industrial Ukrainian enterprises will make possible:

- clear formulation of requirements to professional competences of employees in industries on the basis of organisational competences and dynamic capabilities. This requirements is an input information for CBT plans. Their adequate formulation determines the degree of satisfaction of the labour market demands in qualified workforce;
- development of industrial employees abilities to create new knowledge, interact actively with other employees, find new ways of solving problems and providing other competences which are difficult to develop within CBT.

Formation and development of SOK at industrial enterprises will improve CBT and compensate for its disadvantages.

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Стаття надійшла до редакції 6.04.2015.