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MANAGERIAL COMPETENCE OF THE HEAD OF A VOCATIONAL EDUCATION INSTITUTION: STRUCTURE AND SECTORAL VARIABILITY

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Abstract

Relevance. The network of vocational education and training (VET) institutions is heterogeneous in its sectoral training profile, yet existing models of managerial competence describe the head of such an institution as the head of an educational institution in general. The expansion of institutional autonomy, the introduction of supervisory boards involving employers, and key performance indicators for heads shift responsibility for the sectoral relevance of training to the institutional level, leaving unaddressed the theoretical intersection between the sectoral specificity of VET and the managerial competence of its head.

Purpose. To provide a theoretical justification for the two-component structure of the managerial competence of the head of a VET institution and to operationalise its variable component as a matrix “economic sector – sectoral component of managerial competence”.

Methods. Fundamental theoretical research: structural-functional and comparative analysis, theoretical modelling, analysis of regulatory documents and international review studies. A matrix of nine aggregated sectoral areas and twenty passport positions was constructed and populated with 180 baseline and 36 unique characteristics. Two independent scales were applied – the significance of a characteristic (1–3) and the coefficient of substantive sectoral variability of a position; an index of sectoral determinacy of management was calculated.

Results. The significance of positions proved almost invariant across sectors: mean variance is 0.127, eight of twenty positions show zero variance, and 65 % of characteristics were rated critically significant. At the same time, eleven of twenty positions display high substantive sectoral variability. The index of sectoral determinacy exceeds 0.84 in every area (0.846–0.966). Two of twenty positions were reassigned to the general component under the operational criterion. Thirty-six unique characteristics are distributed evenly across the areas.

Conclusions. The managerial competence of the head of a VET institution has a two-component structure: a general (invariant) component of eight elements and a sectoral (variable) component of nine. The sectoral component is a managerial rather than an occupational category. Sectoral variability manifests not in the list of required competences but

in their substantive content, which explains the limited operational adequacy of universal models. The development of a head's competence should follow a proportionality principle that accounts for the institution's sectoral profile, while the formation of the sectoral component requires the managerial application of sectoral knowledge – which gives internships of heads at sector enterprises the status of a structural element of professional development.

Keywords: *managerial competence (MC), invariant component of MC, variable component of MC, competency matrix, sectoral training profile, vocational education, development of managerial personnel.*

Introduction. The network of vocational education and training (VET) institutions is heterogeneous by its very nature. An institution training CNC machine operators and an institution training cooks hold the same legal status, share a similar organisational structure and are subject to identical qualification requirements for their heads. Yet the production environments into which they release their graduates have almost nothing in common: different technologies and different rates of technological renewal, different types of employers, a different structure of regional demand for skills, different occupational standards, a different cost of error and different risks.

This contradiction raises a question that has not so far been posed directly: can the managerial competence of the head of a VET institution be universal – independent of which specialists the institution actually trains? Existing models of managerial competence answer it affirmatively by default: they describe the head of a VET institution as the head of an educational institution in general, and treat sectoral specificity at most as a contextual circumstance that does not alter the structure of competence.

The need to revisit this position follows from changes in the regulatory environment. The Law of Ukraine “On Vocational Education” No. 4574-IX, adopted on 21 August 2025, substantially expanded the educational and financial autonomy of institutions, introduced supervisory boards involving employers, key performance indicators for the head, independent confirmation of learning outcomes at qualification centres, and – from 2027 – elements of performance-based funding (Verkhovna Rada of Ukraine, 2025). Each of these innovations has one shared consequence: responsibility for the sectoral relevance of training shifts from the level of the system to the level of the institution and personally to its head. Autonomy

without sectoral competence turns into the freedom to take unfounded decisions.

The European context reinforces this conclusion. Studies of quality assurance arrangements in VET in Great Britain (Radkevych, 2025a), Ireland (Radkevych, 2025b) and Denmark (Kolyshko, 2026) show that quality assurance mechanisms are increasingly tied to sectoral frameworks and employer requirements rather than to general educational standards alone. The concept of centres of vocational excellence, developing across the European area, proceeds from the premise that a VET institution is a node of a sectoral skills ecosystem rather than a self-contained educational establishment (Cedefop, 2026; Arribas, 2025). The review study of the Organisation for Economic Co-operation and Development states explicitly that heads of VET institutions operate at the intersection of the education system and industry and require competences that general preparation of school leaders does not provide (OECD, 2021).

At the same time, Ukrainian studies devoted to the training of specialists in particular sectors – construction (Subina, 2025; Svyrydiuk, 2025, 2026), energy (Kalenskyi, 2025; Artyushenko, 2026), transport (Lebid, 2025; Malinovska, 2025) and logistics (Krasnov, 2026) – convincingly demonstrate how different the conditions, content and organisation of training are across sectors. The managerial side of this difference, however, remains outside the field of view: sectoral specificity is described as a pedagogical problem rather than as a factor that structures the competence of the head.

The core thesis of this article is that the managerial competence of the head of a VET institution has a two-level nature: a general (invariant) component common to the heads of all educational institutions, and a sectoral (variable) component determined by the institution's training profile. The task of the article is not merely to

declare this thesis but to operationalise it: to show what sectoral variability consists in, how far it extends, and where the boundary between the variable and the invariant runs.

Sources. Studies relevant to the problem form four groups that have so far developed in parallel.

The first group concerns the competence-based approach and the design of competence models. Recent work stresses the interdisciplinary character of such models and the need to align them with labour-market requirements (Kualaieva, 2025). A methodological premise of this design work is the proposition that a model of the specialist forms the basis for constructing the content of vocational training (Pryhodii & Vasiuchenko, 2010); the present article transfers that logic from the specialist to the head of the institution that trains specialists. Studies of the competence profiles of VET teachers show that the competence of such a professional is formed within a field of tension between the pedagogical and the occupational “regimes of competence” (Antera, 2022; Antera & Nilsson, 2025). This idea of duality is methodologically close to the model proposed here, but it concerns the teacher rather than the head.

The second group deals with the managerial and leadership competence of the head of an educational institution. A functional logic prevails here: strategic, organisational, HR, communicative, digital and other elements are distinguished (Orlova & Familiarska, 2025). Conceptions of distributed and collaborative leadership are developing (Keravnos & Kafa, 2026), as are accounts of the head’s role in knowledge sharing within a VET institution (Glosvik & Sekkingstad, 2025) and of strategies for managing a VET institution towards excellence (Kanyakan et al., 2024). What these works share is that the sectoral profile of the institution is not a variable of the model.

The third group addresses the competence of the head of a VET institution specifically. The OECD review (2021) records the particular status of such a head, including the need for experience of interaction with industry, yet does not translate this observation into a structural model of competence. The study of tensions between local production context and national training standards (Hadley,

2020) outlines the problem but leaves it at the level of a statement.

The fourth group concerns the sectoral specificity of VET. Works devoted to the training of construction workers (Homeniuk, 2025; Mykytiuk, 2025; Kucher, 2025), renewable-energy specialists (Artyushenko, 2026), transport specialists (Lebid, 2025) and in-company trainers under conditions of digitalisation (Humennyi, 2025), together with historical-comparative studies of changing competence demands within a single sector (Broberg, 2025) and of competence-based agricultural education (Nyamweru et al., 2024), reveal the sectoral distinctiveness of training content. They do not, however, rise to the level of institutional management.

The state of research is therefore characterised by a gap: sectoral specificity has been studied thoroughly at the level of educational content, managerial competence at the level of universal functions, while their intersection remains unfilled.

The aim of the article is to provide a theoretical justification for the two-component structure of the managerial competence of the head of a VET institution and to operationalise its variable (sectoral) component as a matrix “economic sector – sectoral component of managerial competence”.

Achieving this aim entails the following objectives: to formulate a definition of the managerial competence of the head of a VET institution that accounts for the sectoral determination of management; to distinguish the sectoral component of managerial competence from the occupational competence of the head as a specialist of the sector; to construct the structure of the sectoral component and unfold it into a system of comparable positions; to populate these positions with sector-specific content for nine aggregated sectoral areas; to identify regularities in the distribution of significance and substantive variability of positions; and to propose a mechanism for the formation of the sectoral component.

The study tests two hypotheses. First: the significance of managerial positions has low cross-sectoral variance, that is, heads of institutions with different profiles require fundamentally the same list of managerial competences. Second: the substantive content of these positions displays high sectoral

variability, that is, one and the same competence is composed of different elements in different sectors. Were both hypotheses to hold simultaneously, universal models of managerial competence would prove formally correct but operationally insufficient.

The scientific novelty of the study lies in the fact that, for the first time, a theoretical case is made for structuring the managerial competence of the head of a VET institution into invariant and variable components, where the invariant reflects universal requirements for managing an educational institution and the variable (sectoral) is determined by the sectoral orientation of vocational training and defines the specificity of the head's managerial knowledge, skills, proficiencies, abilities and professionally significant qualities. An operational criterion for separating the components – the coefficient of substantive sectoral variability of a position – is proposed for the first time, together with an instrument for operationalising the variable component in the form of the matrix “economic sector – sectoral component of managerial competence”.

The practical significance of the results lies in the possibility of using the matrix as a basis for updating the occupational standard for the head of a VET institution, for designing two-block continuing-education programmes for managerial staff, and as a diagnostic self-assessment tool for a head taking up a post at an institution with a particular sectoral profile.

Methods. The study is fundamental and has been carried out by methods of theoretical analysis. Structural-functional analysis was used to distinguish the elements of managerial competence by circuits of managerial decision-making; comparative analysis, to compare sectoral areas within a single system of positions; theoretical modelling, to construct the two-component model and the mechanism of formation of the sectoral component (Prygodii & Radkevych, 2026); and document analysis, to examine legislation, occupational standards and international review studies.

The source base of the study comprised: the Law of Ukraine “On Vocational Education” No. 4574-IX and secondary legislation regulating dual education; occupational standards for managerial

staff in education; materials of the register of qualifications and occupational standards of the National Qualifications Agency; international review studies on VET teachers and leaders; publications by Ukrainian researchers on the training of specialists in particular sectors, which served as a source of factual material for populating the sectoral positions of the matrix; and the array of anonymised survey responses from heads of VET institutions collected by the authors in 2026 and released in open access (Pryhodii et al., 2026).

The research procedure consisted of five steps. The first was the identification of nine elements of the sectoral component, using the criterion of the separateness of a circuit of managerial decision-making. The second was the unfolding of each element into two or three passport positions, twenty in total. A position is the unit of comparison: it is formulated identically for all sectors but populated with sector-specific content, which makes sectors properly comparable. Each position was assigned a dominant level within a seven-level scale of descriptors: knowledge → skills → proficiencies → abilities → professionally significant qualities → experience of activity → value attitudes.

The third step was the identification of nine aggregated sectoral areas covering the principal profiles of the VET network: mechanical engineering and metalworking; energy and electrical engineering; construction and infrastructure; transport and logistics; agriculture and the food industry; information technology and telecommunications; services, trade and hospitality; light industry and design; and the chemical, extractive and processing industry.

The fourth step was populating the matrix. For each of the nine sectors, each of the twenty positions was formulated as a concrete sector-specific characteristic, which yielded 180 baseline characteristics. In addition, three to four unique characteristics having no direct analogues in other areas were identified for each area – 36 in total. The overall size of the matrix is thus 216 competence characteristics.

The fifth step was assessment on two independent scales, the conflation of which is a common methodological error. The scale of significance (3 – critically significant, without it the

management of an institution of this profile is ineffective; 2 – significant; 1 – basic) answers the question “how important is this” and applies to each of the 180 cells of the matrix. The coefficient of substantive sectoral variability (H – high, M – medium, L – low) answers a different question – “how different is the content of this position across sectors” – and applies to the position as a whole. On this basis, an index of sectoral determinacy of management (ISDM) was calculated as the weighted sum of position significances, with the coefficients of their substantive variability serving as weights, normalised to the maximum attainable value.

Limitations of the study. The estimates of significance and the coefficients of variability are the outcome of theoretical modelling and the authors’ expert-analytical judgement rather than of statistical processing of empirical data, and have the status of a working hypothesis. Their verification requires a separate study. The empirical basis for it is the array of responses collected by the authors from 59 heads of VET institutions concerning managerial challenges, self-assessment of managerial skills, criteria for evaluating effectiveness and barriers to professional development (Pryhodii et al., 2026); the statistical processing of this array and the comparison of its results with the parameters of the model will form the subject of a separate publication. Full verification also requires the involvement of representatives of sectoral employer associations. The list of nine areas is aggregated and does not exhaust the profile diversity of the network; institutions with a mixed training profile require separate treatment.

Results and discussion.

Definition and the key distinction. The managerial competence of the head of a VET institution is defined as an integrated characteristic of the head’s personality that encompasses the system of knowledge, skills, proficiencies, abilities, professionally significant qualities and value attitudes required for the strategic, organisational, HR-related, resource-related, educational and partnership management of the institution, taking

into account the specificity of the sectors for which it trains skilled workers. Structurally, it consists of a general (invariant) and a sectoral (variable) component.

A distinction is essential, without which the proposed model loses its point: the sectoral component of managerial competence is not identical to the occupational competence of the head as a specialist of the corresponding sector. The head of an institution training engineers need not be a manufacturing engineer of the highest qualification; the head of an agricultural institution need not be an agronomist. Their sectoral competence consists in something else – in understanding the sector well enough to take well-founded managerial decisions regarding the institution that trains its workforce.

The sectoral component is a managerial, not an executive category. It manifests itself not in the ability to perform a technological operation but in the ability to judge whether the training facilities correspond to the technological level of the sector, to forecast the region’s demand for skills, to build partnerships with employers, to account for sectoral risks in organising practical training, and to conduct a professional dialogue with the engineering staff of enterprises in a language intelligible to both sides. This distinction removes the sectoral component from the anticipated objection that pedagogical competence is being replaced by technical competence, and at the same time explains why general managerial preparation of the head of a VET institution is insufficient.

Structure of the two-component model. The general (invariant) component covers eight elements whose content does not depend on the institution’s sectoral profile: strategic-analytical, organisational-administrative, HR-and-leadership, communicative-partnership, digital, regulatory-legal, financial-resource and innovation-project. The sectoral (variable) component covers nine elements, each corresponding to a separate circuit of managerial decisions whose content changes with the sector (Table 1). The overall architecture of the model is presented in Figure 1.

Table 1.

Elements of the general and sectoral components of managerial competence		
General (invariant) component	Sectoral (variable) component	Circuit of managerial decisions of the variable component

Strategic-analytical	Sector-occupational (SO)	Occupational and qualification structure of the sector, occupational standards, occupational culture of the sector
Organisational-administrative	Technological (TC)	Production technologies of the sector, the pace of their renewal, correspondence of training facilities
HR-and-leadership	Production-practical (PP)	In-company training, work placement and dual education in the production environment of the sector
Communicative-partnership	Sector-economic (SE)	Economics of the sector and resource intensity of its educational programmes
Digital	Sector-labour-market (LM)	Regional labour market of the sector, forecasting of demand for skills, enrolment and employment
Regulatory-legal	Sector-partnership (SP)	Interaction with employers, sectoral associations and advisory bodies
Financial-resource	Sector-innovation (SI)	Sectoral innovation, technology transfer, development of a centre of vocational excellence
Innovation-project	Sector-risk (SR)	Occupational health and safety under the sector's rules and management of sector-specific risks
–	Sector-strategic (SS)	Strategic positioning of the institution within the sectoral and regional context

Note: the general component comprises eight elements and the sectoral component nine; the ninth row of the general component is therefore empty.

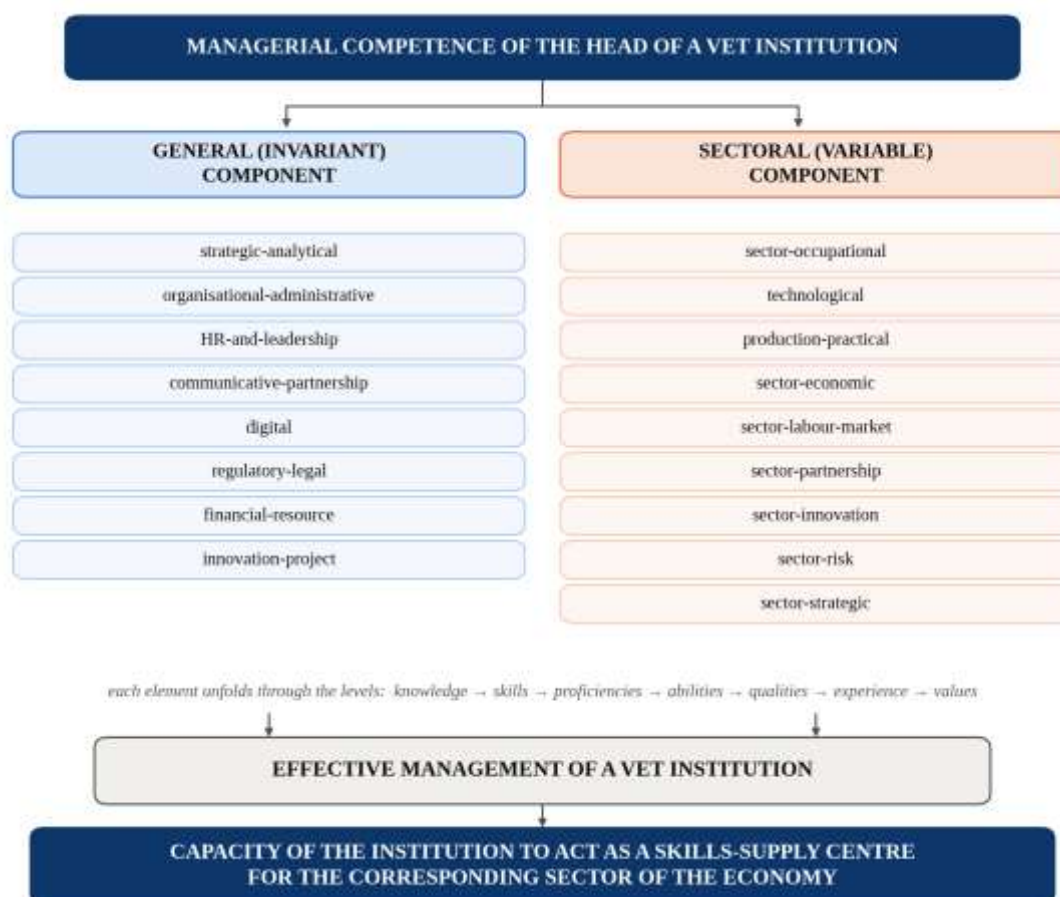


Figure 1. Model of sector-variable managerial competence of the head of a vocational education and training institution

Each element of both components unfolds through a seven-level scale of descriptors: knowledge → skills → proficiencies → abilities → professionally significant qualities → experience of activity → value attitudes. This construction differs from traditional models of five to seven elements in that it fixes not only the list of competences but also the depth of their unfolding.

The matrix “economic sector – sectoral component”. The nine elements of the sectoral component are unfolded into twenty passport positions. Their distribution across elements is uneven and reflects the internal complexity of each circuit of managerial decisions: the sector-occupational and technological elements comprise three positions each, the remainder two. The sector-occupational element includes knowledge of the occupational and qualification structure of the sector (P01), knowledge of its occupational standards and the mechanism of their updating (P02), and the adoption of the sector’s occupational culture as an educational value of the institution (P03). The technological element covers an understanding of the sector’s core production technologies (P04), assessment of the pace of their renewal and of the life cycle of the technologies taught (P05), and bringing the training facilities into line with the technological level of the sector (P06).

The production-practical element unfolds into the organisation of in-company training in a real production environment (P07) and the management of dual education in line with the production cycle of the sector’s enterprises (P08), the latter

corresponding directly to research on the organisation of dual education by sectoral profile (Kucher, 2025). The sector-economic element covers knowledge of the economics of the sector (P09) and management of the resource intensity of sectoral educational programmes (P10); the sector-labour-market element, forecasting of demand for skills (P11) and management of enrolment and employment (P12); the sector-partnership element, interaction with employers and sectoral associations (P13) and representation of the institution in advisory bodies (P14); the sector-innovation element, the introduction of sectoral innovations (P15) and the development of the institution as a centre of vocational excellence (P16); the sector-risk element, occupational health and safety under the sector’s rules (P17) and management of sector-specific risks (P18); and the sector-strategic element, strategic positioning of the institution (P19) and the development of partnership networks (P20).

Populating the twenty positions for nine areas yielded 180 baseline characteristics. In addition, three to four characteristics without direct analogues in other areas were identified for each area – 36 in total. The overall size of the matrix is 216 competence characteristics. The property of the matrix is demonstrated most convincingly by comparing a single position across all sectors. Table 2 presents a fragment of the matrix for position P07 – “organisation of in-company training and work placement in the real production environment of the sector”.

Table 2.

Fragment of the matrix “economic sector – sectoral component”: position P07 “organisation of in-company training and work placement in the real production environment of the sector”

Sectoral area	Content of the managerial task
S1. Mechanical engineering and metalworking	Organisation of in-company training at operating engineering plants, subject to access regimes, including at defence-industry enterprises
S2. Energy and electrical engineering	Organisation of work placement at operating energy facilities, subject to permit procedures, work permits and lock-out systems
S3. Construction and infrastructure	Organisation of work placement on changing construction sites, with site admission arranged and safety supervised away from the institution
S4. Transport and logistics	Organisation of work placement at road haulage, logistics and railway enterprises, subject to access regimes and medical requirements
S5. Agriculture and food industry	Organisation of field and in-company training at agricultural enterprises and food plants, tied to the seasonal calendar of agronomic operations

S6. Information technology and telecommunications	Organisation of placement under conditions of remote and project-based employment, where a conventional workplace in the company is often absent
S7. Services, trade and hospitality	Organisation of placement across a large number of micro and small service enterprises, with the corresponding administration of agreements
S8. Light industry and design	Organisation of placement at garment enterprises, design studios and ateliers, given the small-batch nature of production
S9. Chemical, extractive and processing industry	Organisation of in-company training at high-hazard facilities, with learners completing special safety training and medical examinations

The significance of position P07 is identical across all nine areas and equals 3 points (critically significant); the coefficient of substantive sectoral variability is high.

This position is rated critically significant in all nine sectoral areas without exception. Its formulation is identical. Yet the managerial activity behind it differs across sectors to such an extent that all that remains in common is the word “placement”. The head of an engineering institution solves the problem of restricted-access admission to defence-industry enterprises; the head of a construction institution, the problem of admitting learners to a different site each time while assessing explosive-ordnance risks; the head of an agricultural institution, the problem of tying placement to the agronomic calendar; and the head of an institution in information technology, the problem of finding a form of placement where a conventional workplace in the company is frequently absent altogether. These are not variants of one managerial action. They are different managerial actions united by a common name.

Seven-level unfolding of the elements. Each passport position has a dominant level within the seven-level scale of descriptors, yet the full unfolding of an element covers all seven levels. This is illustrated below for the technological element in two contrasting areas.

For energy and electrical engineering the unfolding takes the following form. Knowledge: the structure and operating regimes of electric power systems, the rules for the installation and safe operation of electrical installations, the system of electrical-safety qualification groups, and renewable generation and energy storage technologies. Skills: organising training and knowledge checks on electrical safety, and aligning training programmes with the requirements of distribution system operators. Proficiencies: maintaining permit documentation for the institution’s electrical

installations, and organising the work of training grounds and simulator facilities. Abilities: thinking in terms of reliability and redundancy, and forecasting the staffing needs of the power system under conditions of infrastructure restoration. Professionally significant qualities: an extreme sense of responsibility and an unwillingness to compromise on safety, and emotional resilience. Experience: interaction with distribution system operators and passing inspections by the energy supervisory authorities. Value attitudes: the unconditional priority of safety of life over production output, and responsibility for the energy resilience of the community.

For information technology and telecommunications the same element unfolds differently. Knowledge: the architecture of computer systems and networks, cloud services, the foundations of cybersecurity, and artificial intelligence technologies. Skills: ensuring rapid renewal of the content of educational programmes, and introducing recognition of non-formal learning outcomes and industry certifications. Proficiencies: managing the institution’s licensing arrangements and organising mentoring by practitioners from the sector. Abilities: the head’s own capacity for rapid re-learning, and decision-making under high technological uncertainty. Professionally significant qualities: openness to the new, the capacity to delegate expertise to younger specialists, and a critical attitude towards technological fashion. Experience: introducing flexible educational programmes and organising distance and blended learning. Value attitudes: continuous learning as a norm, academic integrity under conditions of ubiquitous access to generative tools, and the ethical

application of artificial intelligence (Hurzhii & Prygodii, 2025; Prygodii & Radkevych, 2026).

The comparison shows that none of the seven levels coincides in substance, despite the identity of the element's name. The level of value attitudes is particularly telling: in energy the core value is safety, in information technology it is renewability and integrity. These value orientations are not merely different – they require different types of managerial behaviour: the first presupposes strict control over compliance with regulations, the second a tolerance for controlled experiment.

The principal regularity identified.

Processing the matrix on the two scales produced a result that constitutes the theoretical core of the study. Both hypotheses were confirmed, and it is precisely their combination that yields a non-trivial conclusion.

The significance of positions proved almost invariant with respect to the sector. The mean

variance of significance across the twenty positions is 0.127; eight of the twenty positions have zero variance, that is, they were rated equally critical for all nine areas. The distribution of significance across all 180 baseline characteristics confirms this: 117 characteristics (65 %) were rated critically significant, 62 significant, and only one basic. The significance scale barely differentiates between sectors.

The substantive content of the same positions proved radically different: eleven of the twenty positions were assigned to the group of high substantive variability, seven to medium and two to low. Comparison of the two scales (Figure 2) shows that positions of high variability cluster neither in the zone of high nor in that of low significance: they are distributed evenly across the whole range of significance, as are positions of medium variability.

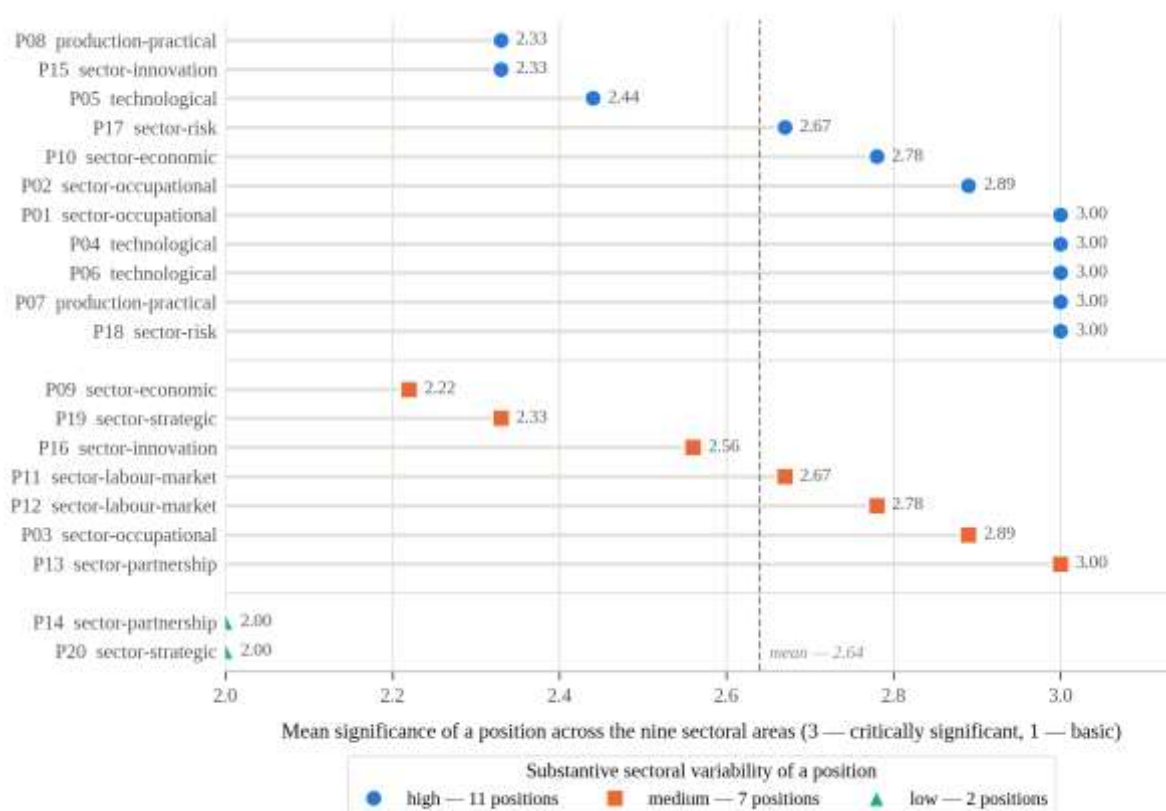


Figure 2. Distribution of passport positions by significance and by the coefficient of substantive sectoral variability

It follows that the scientific novelty of the study may be stated as follows: the sectoral variability of the managerial competence of the head of a VET institution manifests itself not in which managerial competences the head requires, but in

what they are composed of. The two scales measure orthogonal properties, and it is precisely their divergence that explains the methodological weakness of existing models.

Such models, built on a list of universally significant competences, are formally correct: all the competences they list are indeed required of every head. But they describe a shell while leaving its filling empty, and therefore lack operational force – neither the content of preparation for a specific head nor criteria for evaluating that head's performance can be derived from them. This explains why occupational standards for heads of educational institutions, constructed on a universal logic, work poorly in VET: they are not wrong, they are underdetermined.

A second telling example is position P17 – management of occupational health and safety under the sector's rules. It has the widest spread of ratings

among all twenty positions: critically significant in seven areas, significant in light industry, and merely basic in information technology and telecommunications, where it reduces in practice to requirements for the organisation of workstations with display screens. This is the only characteristic in the entire matrix rated at one point. Even here, however, the conclusion is unchanged: where the position is significant, its content differs radically – from work permits in live electrical installations to gas-hazardous and underground operations, from work at height on construction sites to sanitary requirements in training kitchens.

The distribution of positions by character of variability is presented in Table 3.

Table 3.

Grouping of passport positions by the coefficient of substantive sectoral variability			
Group of positions	Position codes	Number	Mean significance
Core of the sectoral component (high variability)	P01, P02, P04, P05, P06, P07, P08, P10, P15, P17, P18	11	2.77
Sectorally modified positions (medium)	P03, P09, P11, P12, P13, P16, P19	7	2.64
Quasi-invariant positions (low)	P14, P20	2	2.00

Coefficient of substantive sectoral variability: high – the content of the position differs radically across sectors; medium – the position is sectorally modified but retains a common logic; low – a quasi-invariant position.

Two positions with a low coefficient of variability deserve separate attention – representation of the institution on the supervisory board and in regional advisory bodies (P14), and the development of partnership networks and international sectoral cooperation (P20). Both received the same mean significance (2.00) in all nine areas, and neither was rated critically significant. The managerial technology here does not depend on the sector: what changes is the set of partners, not the head's mode of action. These positions are more properly assigned to the communicative-partnership and innovation-project elements of the general component. The result is

methodologically important: it shows that the proposed model does not declare everything to be sectoral, but possesses an internal criterion of demarcation that works in both directions.

Sectoral profiles and the index of sectoral determinacy. The distribution of the weights of the nine elements across sectoral areas shows which circuits of managerial decisions are the most sectorally loaded in each area, while the index of sectoral determinacy of management gives an integral estimate of the share of the head's managerial profile that is conditioned by sectoral specificity (Figure 3).

S5. Agriculture and food industry	3.00	3.00	3.00	2.50	3.00	2.50	2.50	3.00	2.50	0.966	ISDM
S7. Services, trade and hospitality	3.00	2.67	3.00	3.00	2.50	2.50	2.50	3.00	2.00	0.923	
S3. Construction and infrastructure	3.00	2.67	3.00	2.00	3.00	2.50	2.50	3.00	2.50	0.915	
S9. Chemical, extractive and processing industry	3.00	3.00	2.50	2.50	2.50	2.50	2.50	3.00	2.00	0.910	
S1. Mechanical engineering and metalworking	2.67	3.00	2.50	2.50	2.50	2.50	2.50	3.00	2.00	0.906	
S2. Energy and electrical engineering	3.00	2.67	2.50	2.50	2.50	2.50	2.50	3.00	2.50	0.902	
S4. Transport and logistics	3.00	2.67	2.50	2.50	3.00	2.50	2.00	3.00	2.00	0.889	
S6. Information technology and telecommunications	3.00	3.00	2.50	2.00	3.00	2.50	3.00	2.00	2.00	0.880	
S8. Light industry and design	2.67	2.67	2.50	3.00	2.50	2.50	2.00	2.50	2.00	0.846	
	SO	TC	PP	SE	LM	SP	SI	SR	SS		
Elements of the sectoral component — mean significance of their positions											

Figure 3. Weights of the elements of the sectoral component and the index of sectoral determinacy of management (ISDM) by sectoral area

The highest index values are recorded for agriculture and the food industry (0.966), services, trade and hospitality (0.923), and construction and infrastructure (0.915). What these areas share is that sectoral specificity intervenes not only in the content of training but in the organisational form of the educational process itself: the seasonality of agronomic operations prevents in-company training from being distributed evenly across the year; the training units of the service sector serve real customers, which adds economic and reputational responsibility for the head; and the site of construction placement moves together with the building site.

The lowest values are those of light industry and design (0.846) and information technology and telecommunications (0.880), where the material anchoring of training is weaker. It is telling, however, that even the lowest value exceeds 0.84. The sectoral determinacy of managing a VET institution is not an exception characteristic of certain “difficult” sectors – it is a general rule for the whole network. It is precisely this that justifies introducing the sectoral component as a mandatory structural element of the model rather than as an optional addition for particular profiles.

The element profiles also reveal substantive differences. In high-hazard sectors – energy, the chemical and extractive industry, construction – the

sector-risk element dominates, its significance reaching the maximum. In information technology, by contrast, the sector-innovation element carries the greatest weight, while the risk element falls to the lowest level across all areas: there the managerial threat lies not in injury but in the content of educational programmes becoming obsolete faster than a learner’s training cycle is completed. In the service sector the sector-economic element carries the highest weight of all areas, reflecting the fragmentation of the market and the high share of self-employment among graduates.

The sector-labour-market element reveals a further regularity. The position on managing enrolment and employment (P12) received high ratings in different areas for opposite reasons: in mechanical engineering, agriculture and light industry because of the stereotype that these occupations lack prestige; in construction and transport because of competition from informal training and outflow of workers; and in information technology because of competition from private education providers. The managerial task is formulated identically, whereas its cause – and hence the instruments for addressing it – differ. This accords with findings of research on career guidance towards skilled trades, which stresses the need to differentiate approaches according to sectoral and social context (Yershova, 2025; Vanina, 2026).

Unique characteristics as the limit of universalisation. Thirty-six characteristics – three to four for each sectoral area – have no direct analogues in other areas. Managing the procedure for awarding electrical-safety qualification groups as a condition of graduation (energy); managing the risk of explosive contamination of agricultural land when planning field placement (agriculture); managing the licensing of the institution as a provider of driver training (transport); managing compulsory periodic medical examinations of learners as a condition of admission to study (the chemical and extractive industry); managing partnership with hundreds of micro-enterprises instead of a few large ones (services) – these managerial tasks cannot be reduced to a common position even at the level of formulation.

It is significant that the unique characteristics are distributed evenly rather than concentrated in one or two “special” sectors. This confirms the systemic character of the phenomenon and means that building an exhaustive universal model of the managerial competence of the head of a VET institution is an unattainable goal in principle: any

universal model will either remain incomplete or lose its operational force.

Mechanism of formation of the sectoral component. The regularities identified allow a principle of proportionality to be formulated: the higher the sectoral specificity of an institution’s educational activity – above all in the organisational form of the educational process, not only in its content – the more significant the sectoral component of its head’s managerial competence becomes.

The sectoral component is formed not through the acquisition of sectoral knowledge as such but through its managerial application. The sequence of unfolding takes the form: baseline managerial competence → sectoral specialisation → deepening of sectoral knowledge → managerial application of sectoral knowledge → accumulation of managerial experience in the sectoral environment → sectoral managerial competence. Omitting the link of managerial application turns the head’s sectoral awareness into unproductive erudition. The structure of the mechanism of formation is presented in Figure 4.

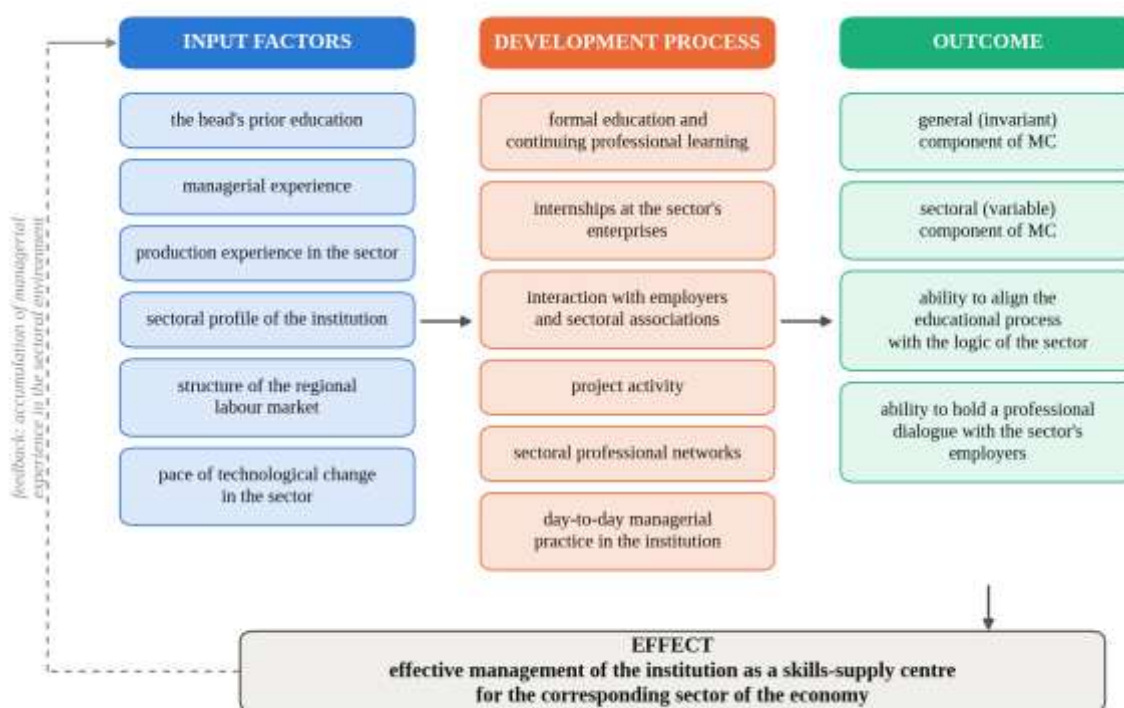


Figure 4. Mechanism of formation of the sector-variable managerial competence of the head of a vocational education and training institution

Practical consequences for the system of preparing managerial staff follow from this

mechanism. Internships of heads at enterprises in the corresponding sector cease to be a desirable form of

continuing professional development and acquire the status of a structural element of their professional growth. Continuing-education programmes for heads of VET institutions are best built on a two-block scheme – with a general managerial invariant block and a sectorally profiled variable block. The participation of heads in sectoral professional networks, skills competitions and project activity (Prygodii & Luparenko, 2025) should be regarded as a channel for forming the sectoral component rather than merely as a form of the institution's external activity.

Discussion. The results obtained accord with the findings of international research while refining them. The OECD observation (2021) about the particular status of the head of a VET institution working at the intersection of education and industry acquires a structural expression in the proposed model: the intersection ceases to be a metaphor and becomes a variable component with a defined composition. The problem of tension between local production context and national training standards (Hadley, 2020) is explained by the fact that national standards fix the invariant component, whereas local context operates through the variable one.

The idea of the duality of “regimes of competence” for the VET teacher (Antera, 2022; Antera & Nilsson, 2025) finds its managerial analogue in this article, but with an essential difference. For the teacher both regimes – pedagogical and occupational – are executive: the teacher must both teach and command the occupation. For the head, the sectoral component remains purely managerial, which makes the proposed distinction an independent theoretical result rather than a transfer of an existing construction to another post.

The concept of centres of vocational excellence, which treats the VET institution as a node of a sectoral skills ecosystem (Arribas, 2025; Wuryanto et al., 2026), logically requires a head with a developed sectoral component: managing a node of a sectoral ecosystem without understanding the sector is impossible. Similarly, studies of the head's role in knowledge sharing within a VET institution (Glosvik & Sekkingstad, 2025) and of collaborative leadership (Keravnos & Kafa, 2026) describe mechanisms whose effectiveness depends

on whether the head is able to judge the sectoral relevance of the knowledge the staff exchange.

Research on competence-based agricultural education (Nyamweru et al., 2024) and the historical-comparative analysis of changing competence demands in the automotive sector (Broberg, 2025) confirm empirically what is here justified theoretically: competence requirements are distinctly conditioned by sector and by time. Digital competence, which appears in general models as a single element (Humennyi, 2025; Zubizarreta Pagaldai et al., 2025), splits within the proposed model: its invariant part – digital management of the institution – remains in the general component, whereas its sectoral part – an understanding of the digital technologies of the sector itself – moves to the technological element of the variable component. A telling instance of such a split is the use of artificial intelligence in assessing the learning outcomes of future engineers (Radkevych et al., 2025): the managerial decision to introduce such an instrument belongs to the invariant component, whereas judging its suitability for particular sectoral qualifications belongs to the variable one.

The seven-level scale of descriptors applied in the model accords with research treating competence as an integral formation that includes a value-and-identity level (Raudasoja et al., 2024). Within the sectoral component this level acquires a concrete expression: the adoption of the sector's occupational culture and ethics as an educational value of the institution (position P03) received a mean significance of 2.89 and a critical rating in eight areas out of nine. A head who does not share the value orientations of the sector is unable to form them in learners through the institution's educational environment.

Separate consideration is due to how the proposed model relates to existing occupational standards for managerial staff in education. Such standards are built on a universal logic and describe the labour functions of the head of an educational institution irrespective of the type of institution. The proposed model does not contradict this construction but builds upon it: the invariant component can be mapped directly onto existing labour functions, whereas the variable one requires a separate document – a sectoral competence profile that details the content of the same labour functions

for a particular sectoral area. This approach makes it possible to avoid nine separate occupational standards while removing the underdetermination of a single one.

A practical consequence for the system of evaluating a head's performance is the possibility of differentiating the key performance indicators introduced by the Law of Ukraine "On Vocational Education". Indicators resting on the invariant component – financial discipline, staff stability, digitalisation of management – may be common to the entire network. Indicators resting on the variable component – the correspondence of training facilities to the technological level of the sector, the depth of partnership with profile employers, the rate of employment in sectoral occupations – require sectoral normalisation; otherwise comparing institutions of different profiles on a single scale loses its meaning.

The principal limitation of the results remains their status as a theoretical model. The values of variance, of the coefficients of variability and of the index of sectoral determinacy should be read as parameters of the constructed model rather than as measured characteristics of actual managerial practice. At the same time, the model is formulated so as to permit direct empirical testing: both hypotheses are operationalised as quantities obtainable by the method of expert assessment independently of the authors.

Conclusions. The managerial competence of the head of a VET institution has an integrated two-component structure consisting of a general (invariant) component of eight elements and a sectoral (variable) component of nine. The demarcation between the components is drawn not intuitively but by an operational criterion – the coefficient of substantive sectoral variability of a position – which works in both directions: on its basis two positions out of twenty were assigned to the general component.

The sectoral component of managerial competence is not identical to the occupational competence of the head as a specialist of the sector. It is a managerial category and consists in understanding the sector well enough to take well-founded managerial decisions regarding the institution that trains its workforce, rather than in the

ability to perform the technological operations of that sector.

The sectoral variability of managerial competence manifests itself not in the list of competences a head requires but in their substantive content. Within the constructed model the mean variance of position significance is 0.127, eight positions out of twenty show zero variance, and 65 % of characteristics were rated critically significant; at the same time, eleven positions out of twenty display high substantive variability. This explains the limited operational adequacy of universal models of managerial competence: they are not wrong, they are underdetermined.

The index of sectoral determinacy of management exceeds 0.84 in all nine sectoral areas (from 0.846 to 0.966), and the thirty-six unique characteristics are distributed evenly across the areas. The sectoral conditioning of management is therefore a general rule for the VET network, and building an exhaustive universal model of the managerial competence of its head is an unattainable goal in principle.

The development of the managerial competence of the head of a VET institution should be pursued not only along general managerial lines but also along the corresponding sectoral profile, following the principle of proportionality: the higher the sectoral specificity of an institution's educational activity, the more significant the sectoral component of its head's competence becomes. This component is formed through the managerial application of sectoral knowledge rather than through its accumulation, which gives internships of heads at the sector's enterprises the status of a structural element of professional development.

The practical significance of the results lies in the fact that the matrix "economic sector – sectoral component" may serve as a basis for developing sectoral competence profiles for heads as a supplement to a single occupational standard, for the sectoral normalisation of key performance indicators of a head's activity, and as a diagnostic self-assessment tool for a head taking up a post at an institution with a particular sectoral profile.

The proposed model does not contradict existing universal models of managerial competence but builds upon them. The invariant component maps onto the current labour functions of the head

of an educational institution, whereas the variable component requires separate formalisation as sectoral competence profiles. This approach preserves the unity of the occupational standard while removing its underdetermination with respect to VET institutions of different sectoral orientation.

Prospects for further research are associated with the empirical verification of the matrix on the

array of responses from heads of VET institutions collected by the authors (Pryhodii et al., 2026), with the subsequent involvement of representatives of sectoral employer associations; with the development of a model for institutions with a mixed training profile; and with the design of two-block continuing-education programmes for the managerial staff of vocational education.

Conflict of Interest

The author certifies that no conflict of interest (financial, professional, or personal) exists that could have influenced the objectivity of the research results or conclusions. The integrity of the double-blind peer review process was ensured through a mandatory declaration of the absence of conflict of interest submitted via the journal's editorial system. This protocol guaranteed complete author anonymity and the independence of the expert evaluation throughout the entire editorial cycle.

Declaration on the Use of Generative Artificial Intelligence.

During the preparation of this manuscript, the authors used Claude (Anthropic, model Claude Opus 5) for searching and verifying bibliographic data, organizing materials, calculating derived indicators, preparing figures, and language editing and formatting of the text. The conceptual model, empirical data, scientific conclusions, and interpretation of the results are the authors' own. Following the use of the tool, the entire manuscript was reviewed and edited by the authors, who take full responsibility for its content and scientific accuracy. Artificial intelligence is not a co-author of this work.

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УПРАВЛІНСЬКА КОМПЕТЕНТНІСТЬ КЕРІВНИКА ЗАКЛАДУ ПРОФЕСІЙНОЇ ОСВІТИ: СТРУКТУРА ТА ГАЛУЗЕВА ВАРІАТИВНІСТЬ

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Реферат:

Актуальність. Розширення автономії закладів, запровадження наглядових рад за участю роботодавців і ключових показників ефективності діяльності керівника покладають на заклад відповідальність за відповідність підготовки здобувачів освіти потребам галузі, що залишає недостатньо дослідженим теоретичний зв'язок між галузевою специфікою професійної освіти та управлінською компетентністю її керівника.

Мета. Теоретично обґрунтувати двоскладникову структуру управлінської компетентності керівника закладу професійної освіти та визначити її варіативний складник у вигляді матриці «галузь – галузевий складник управлінської компетентності».

Методи. Фундаментальне теоретичне дослідження здійснено на основі структурно-функційного і порівняльного аналізу, теоретичного моделювання, аналізу нормативних документів і міжнародних оглядових досліджень. Побудовано матрицю з дев'яти укрупнених галузевих напрямів і двадцяти позицій паспорта, наповнену 180 базовими та 36 унікальними характеристиками. Застосовано дві незалежні шкали – значущості характеристики (1–3) та коефіцієнта змістової галузевої варіативності позиції; обчислено індекс галузевої детермінованості управління.

Результати. Значущість позицій виявилася майже інваріантною щодо галузі: середня дисперсія становить 0,127, вісім позицій із двадцяти мають нульову дисперсію, 65 % характеристик оцінено як критично значущі. Водночас одинадцять позицій із двадцяти мають високу змістову галузеву варіативність. Індекс галузевої детермінованості перевищує 0,84 в усіх напрямках (0,846–0,966). Дві позиції з двадцяти за операціональним критерієм перенесено до загального складника. Тридцять шість унікальних характеристик розподілені рівномірно по напрямках.

Висновки. Управлінська компетентність керівника закладу професійної освіти має двоскладникову структуру: загальний (інваріантний) складник із восьми компонентів і галузевий (варіативний) складник із дев'яти. Галузевий складник є управлінською, а не фаховою категорією. Галузева варіативність виявляється не в переліку потрібних компетентностей, а в їх змістовому наповненні, що пояснює обмежену операційну придатність універсальних моделей. Розвиток компетентності керівника має відбуватися за принципом пропорційності – з урахуванням галузевого профілю закладу професійної освіти, – а формування галузевого складника потребує управлінського застосування галузевих знань, що надає стажуванню керівників на підприємствах галузі статусу структурного елемента професійного розвитку.

Ключові слова: управлінська компетентність (УК), інваріантний складник УК, варіативний складник УК, компетентнісна матриця, галузевий профіль підготовки, професійна освіта, розвиток керівних кадрів.

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