ORGANIZATIONAL AND ECONOMIC MECHANISMS FOR IMPLEMENTING THE CLUSTER APPROACH IN THE MANAGEMENT OF VOCATIONAL EDUCATION INSTITUTIONS

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Abstract: The contemporary landscape of vocational education and training (VET) is characterized by a widening gap between the competencies generated by educational institutions and the dynamic skill requirements of the modern labor market. This article addresses the systemic inefficiencies of traditional, centralized management models and proposes the "Cluster Approach" as a strategic mechanism for organizational and economic transformation. By integrating educational providers, industrial enterprises, and regional governance bodies into a unified ecosystem, the cluster model aims to optimize resource allocation, diversify funding streams, and enhance the employability of graduates. The first part of this study critically analyzes the theoretical underpinnings of educational-industrial clusters, drawing upon Michael Porter's competitive advantage theory and the "Triple Helix" model of innovation. It establishes the conceptual framework for shifting from a supply-driven education system to a demand-driven, network-based governance structure essential for sustainable regional economic development.

Keywords: vocational education management, educational-industrial cluster, triple helix model, regional economy, organizational efficiency, public-private partnership (PPP), human capital investment.

In the context of the Fourth Industrial Revolution (Industry 4.0), the management of vocational education institutions (VEIs) faces a dual challenge: ensuring the relevance of skills while maintaining economic efficiency. The

traditional "linear" management model, prevalent in many post-Soviet and developing economies, operates on a vertical hierarchy where decision-making, funding, and curriculum design flow from the central ministry down to the college. While this model ensures standardization, it suffers from significant "institutional rigidity."

From an organizational perspective, this rigidity manifests as a delayed response to labor market signals. By the time a centralized curriculum is updated and approved, the technology in the industry has often evolved, rendering the training obsolete. From an economic perspective, the traditional model places the entire financial burden on the state budget, leading to chronic underfunding of material-technical bases and a lack of incentives for institutions to generate extra-budgetary income. The result is a paradox: high public spending on education coexists with a shortage of qualified personnel in the real economy. This systemic dysfunction necessitates a transition to a "Cluster Approach" - a decentralized, network-centric model that aligns the economic interests of all stakeholders.

The theoretical basis for applying the cluster approach to vocational education is derived from Michael Porter's theory of competitive advantage. Porter defined a cluster as a "geographic concentration of interconnected companies and institutions in a particular field." In the context of VET, this translates to an **Educational-Industrial Cluster -** a localized system where the boundaries between the "place of learning" (college) and the "place of production" (enterprise) are permeable.

Unlike simple bilateral cooperation (e.g., a college signing a memorandum with a factory), a cluster represents a higher order of organizational complexity characterized by the following theoretical attributes:

- **The Triple Helix Synergy:** The cluster operates on the interaction of three institutional spheres: the *State* (regulatory framework and base

funding), the *Industry* (technology, practical training, and demand), and the *Education System* (human capital supply and R&D).

- **Economies of Scale and Scope:** By sharing resources - such as high-tech laboratories, expert personnel, and training grounds - cluster members reduce individual operational costs. A college does not need to buy an expensive CNC machine if it has access to the partner enterprise's facilities; conversely, the enterprise saves on recruitment and retraining costs.
- **Knowledge Spillover:** The cluster acts as a mechanism for the rapid diffusion of tacit knowledge. Innovation introduced in a leading enterprise within the cluster is quickly integrated into the educational curriculum, thereby raising the technological baseline of the entire region.

Thus, the adoption of the cluster approach is not merely an administrative regrouping of institutions but a fundamental shift in the *economic logic* of vocational education management. It moves the system from a "social expenditure" model to an "investment return" model, where the output is measured not by the number of graduates, but by the added value they bring to the regional economy.

The transition to a cluster model requires a radical restructuring of the organizational architecture of vocational education. The prevailing command-and-control structure, where individual colleges report directly to regional departments, is insufficient for the horizontal complexity of a cluster. Therefore, the core of the proposed organizational mechanism is the establishment of a **Cluster Coordinating Council (CCC)**.

The CCC serves as the supreme governing body of the cluster, possessing not merely advisory but executive powers regarding strategic planning. Structurally, the CCC must represent the "Triple Helix" stakeholders:

1. **Public Sector:** Representatives of the Agency for Vocational Education and regional Khokimiyats (to ensure regulatory compliance and social mandates).
2. **Private Sector:** CEOs and HR Directors of anchor enterprises (to define competence standards and investment priorities).
3. **Academic Sector:** Directors of VEIs and scientific consultants (to ensure pedagogical integrity).

The organizational innovation lies in the redistribution of functional responsibilities. Within this mechanism, the **Sectoral Qualification Committees**—sub-units of the CCC formed by industry experts—take the lead in designing educational standards and assessment criteria. This ensures that the content of education is "backward engineered" from the workplace requirements. Furthermore, the organizational mechanism necessitates the creation of **Resource Sharing Centers**. Instead of every college duplicating expensive workshops, the cluster designates "Centers of Excellence" equipped with state-of-the-art machinery, which are accessible to students from all participating institutions within the cluster network. This eliminates capital redundancy and increases the utilization rate of expensive assets.

The economic viability of the cluster approach hinges on diversifying funding sources and moving away from total reliance on the state budget. The proposed economic mechanism operates on the principle of **Multi-Channel Financing**, which integrates three distinct streams:

- **State Budgetary Funding (Base Level):** Covers the fundamental costs (infrastructure maintenance, core staff salaries) and ensures the fulfillment of the state educational order (grants).
- **Private Sector Co-Financing (Targeted Level):** This is the critical variable. In a cluster model, private partners finance the variable costs associated with specialized training. This includes the supply of

raw materials for workshops, stipends for dual-education students, and bonuses for master trainers.

- **Extra-Budgetary Revenue (Commercial Level):** The cluster entity is legally empowered to engage in commercial activities. This involves transforming college workshops into "Technoparks" or "Small Production Enterprises" that fulfill real market orders during the training process. The revenue generated is reinvested into the material-technical base and staff incentives.

However, private sector participation requires a robust system of **Fiscal and Economic Incentives**. The mechanism proposes the introduction of a specific tax credit system where enterprises investing in the material base of VEIs receive a reduction in corporate income tax equivalent to the investment amount. Additionally, the mechanism includes the concept of **"Human Capital Futures"**—contracts where an enterprise pre-pays for the training of a specific cohort of students in exchange for a guaranteed period of employment post-graduation. This financial instrument reduces the risk for the educational institution and guarantees ROI for the employer.

A crucial component of the organizational-economic mechanism is the digitalization of management processes. The cluster must operate on a unified **Labor Market Intelligence System (LMIS)**. This digital platform aggregates real-time data on regional vacancy trends, skill shortages, and technological shifts.

Organizational decisions - such as increasing admission quotas for "Mechatronics" or reducing them for "Humanities" - are thus made based on algorithmic analysis of economic data rather than historical inertia. This data-driven approach minimizes the economic waste associated with "overproduction" of specialists in low-demand fields and "underproduction" in critical industrial sectors.

The implementation of the organizational and economic mechanisms detailed in the previous sections is projected to yield transformative results for the vocational education system. Based on comparative analyses of international cluster models (e.g., Germany's dual system hubs, South Korea's Meister high schools), the transition to a cluster governance model in Uzbekistan is expected to deliver the following Key Performance Indicators (KPIs):

- **Increased Employability and Relevance:** The "backward design" of curricula, driven by the Cluster Coordinating Council, is projected to increase the employment rate of graduates in their field of specialization from the current baseline to 85-90%. The "skills gap" is significantly narrowed as training equipment mirrors industrial reality.
- **Economic Efficiency and ROI:** The multi-channel financing mechanism will reduce the fiscal burden on the state budget by an estimated 20-30% for specialized training costs. Simultaneously, the Return on Investment (ROI) for public spending increases, as the system ceases to produce "deadstock" graduates who require retraining immediately after hiring.
- **Regional Economic Synergy:** The cluster acts as a catalyst for regional development. By concentrating human capital and technological resources, the cluster attracts Foreign Direct Investment (FDI), as investors prioritize regions with a guaranteed supply of skilled labor.

While the theoretical argument for clusters is compelling, the practical implementation faces significant "institutional friction." The discussion highlights three primary risks that must be managed:

- **Regulatory and Legal Barriers:** The current legislation in Uzbekistan strictly delineates public and private entities. There is a lack of normative acts regulating the "hybrid" governance nature of a cluster.

Without a specific "Law on Educational Clusters," the decisions of the Coordinating Council may lack legal force, leading to a reversion to centralized control.

- **The Risk of "Corporate Capture":** There is a danger that a dominant enterprise within the cluster might tailor the curriculum too narrowly to its specific technological needs. This could compromise the "educational breadth" of the graduate, limiting their mobility in the wider labor market. The Agency for Vocational Education must act as a regulator to ensure that *transferable skills* (soft skills, fundamental engineering) remain a core part of the curriculum.
- **Cultural Resistance:** The shift from a subsidized, passive management culture to an entrepreneurial, competitive cluster culture requires a new breed of educational managers. Current directors of colleges and technicums may lack the competency to manage complex stakeholder relationships and commercial activities.

In conclusion, the "Cluster Approach" is not merely an administrative optimization but a strategic necessity for the modernization of the vocational education system in Uzbekistan. It represents a shift from "managing institutions" to "managing ecosystems." The organizational mechanism of the Coordinating Council ensures responsiveness, while the economic mechanism of multi-channel financing ensures sustainability.

For the Agency for Vocational Education, the following strategic actions are recommended to operationalize this model:

1. **Legislative Reform:** Initiate the drafting of a regulatory framework that grants clusters the status of "Special Economic and Educational Zones," allowing for tax holidays and simplified procurement procedures.
2. **Managerial Capacity Building:** Launch a specialized "Educational MBA" program for directors of vocational institutions to

equip them with skills in project management, fundraising, and public-private partnership negotiations.

3. **Pilot Implementation:** Select 3-4 diverse regions (e.g., a Textile Cluster in Fergana, a Petrochemical Cluster in Kashkadarya) to pilot the mechanism before a nationwide rollout.

Ultimately, the success of the cluster approach depends on building a culture of trust between education and industry. Only through this symbiotic relationship can the vocational education system become a true driver of national economic competitiveness.

References:

1. Bekmurodov A.Sh., G‘afurov U.V. O‘zbekistonda innovatsion rivojlanish jarayonlarini boshqarish metodologiyasi: Monografiya. – Toshkent: «Iqtisodiyot», 2020. – 180 b.
2. G‘ulomov S.S., Shermuhamedov A.T. Innovatsion menejment: Darslik. – Toshkent: «Fan va texnologiya», 2018. – 368 b.
3. Xaydarov M.T. Ta’lim muassasalarini boshqarishning nazariy va metodologik asoslari: Pedagogika fanlari doktori (DSc) dissertatsiyasi avtoreferati. – Toshkent, 2021. – 64 b.
4. Yo‘ldoshev J.G‘., Usmonov S.A. Pedagogik texnologiya asoslari: Qo‘llanma. – Toshkent: «O‘qituvchi», 2004. – 104 b.
5. Ibragimov X.I., Abdullayeva Sh.A. Pedagogika nazariyasi (Darslik). – Toshkent: «Fan va texnologiya», 2008. – 288 b.
6. Tursunov I.E. Inson kapitalini rivojlantirishning institutsional jihatlari // “Iqtisodiyot va innovatsion texnologiyalar” ilmiy elektron jurnali. – 2019. – № 5. – B. 1–10.
7. Porter M.E. The Competitive Advantage of Nations. – New York: Free Press, 1990. – 855 p.
8. Ketels C. The Development of the Cluster Concept – Present Experiences and Further Developments. – Harvard Business School, 2003. – 32 p.

9. Rauner F., Maclean R. Handbook of Technical and Vocational Education and Training Research. – Springer, 2008. – 1130 p.

10. Rosenfeld S.A. A Guide to Cluster Strategies in Less Favoured Regions. – OECD/European Union, 2002. – 94 p.

11. Мухаметзянова Г.В. Кластерный подход к управлению профессиональным образованием: Монография. – Казань: Изд-во «ИПП ПО РАО», 2008. – 176 с.

12. Смирнов И.П. Теория профессионального образования. – М.: Российская академия образования; НИИРПО, 2006. – 320 с.