Web of Discoveries: Journal of Analysis and Inventions
webofjournals.com/index.php/3

IMPLEMENTATION OF THE DUAL EDUCATION SYSTEM IN TECHNICUM-LEVEL INSTITUTIONS: A COMPETENCY-BASED APPROACH TO INTEGRATING ACADEMIC LEARNING WITH INDUSTRIAL PRACTICE

Ashurova Sanobar Yuldashevna
Head of the Department at the Institute for the Development of Professional Education, Doctor of Pedagogical Sciences, Professor, Tashkent, Uzbekistan

Abstract
The contemporary landscape of vocational education is characterized by a growing disconnect between formal academic preparation and the practical competency demands of an increasingly dynamic labor market. This article addresses the structural inefficiency of theory-dominant instruction in technicum-level institutions (TLIs) and proposes the "Dual Education System" as a strategic mechanism for curriculum-practice transformation. By integrating educational institutions, industrial enterprises, and state regulatory bodies into a unified ecosystem, the dual model aims to harmonize learning outcomes with employer expectations and strengthen the long-term employability of graduates.

Keywords: Vocational education management, dual education system, competency-based approach, technicum-level institutions, workplace learning, public-private partnership.

Introduction

In the context of Industry 4.0 and accelerating digital transformation, the management of technicum-level institutions (TLIs) faces a dual challenge: preparing graduates with industry-relevant competencies while operating within an educational infrastructure designed for a different era of production. The prevailing model operates on a vertical hierarchy where curriculum design, instructional planning, and assessment criteria flow from state educational standards down to classroom practice, with enterprises receiving graduates rather than shaping them. While this ensures systemic uniformity, it suffers from significant "institutional inertia" — a structural resistance to adapting educational content to the pace of technological change. Presidential Decree PF-158 (2024) explicitly identifies the elimination of the theory-practice gap as a national priority [1], yet Cabinet of Ministers Resolution No. 163 (2021) on dual education remains insufficiently operationalized at the institutional level [2].

From an organizational perspective, this inertia manifests as persistent misalignment between state qualification frameworks and actual enterprise skill requirements. From an economic perspective, the traditional model generates substantial hidden costs: enterprises invest heavily in post-hire adaptation, while TLIs operate laboratory facilities at far below productive capacity. The result is a paradox: graduate output volumes steadily increase while employer satisfaction indices and employment rates in core specializations remain stagnant [9]. This systemic dysfunction necessitates a transition to a "Dual Education System" — a structured pedagogical

Web of Discoveries: Journal of Analysis and Inventions
webofjournals.com/index.php/3

architecture in which academic instruction and industrial practice are concurrently integrated dimensions of a single, unified learning process [6].

The theoretical basis for the dual education system in TLIs is derived from Billett's theory of workplace affordances, which positions the production environment as a pedagogical medium of unique instructional power. Billett defined workplace learning as shaped by "guided participation in authentic occupational environments" [5], translating in the TLI context to the principle of structured co-presence, wherein the learner simultaneously occupies the roles of student and apprentice. This is reinforced by Vygotsky's Zone of Proximal Development [13], which locates productive learning precisely at the boundary between independent capability and expert-guided performance — a boundary the workplace is structurally positioned to sustain.

Unlike simple internship or end-of-year practicum programs, a genuine dual education system represents a higher order of educational integration characterized by the following theoretical attributes:

• **Structural Simultaneity:** The learner's time is formally divided between the educational institution and the enterprise throughout the entire study period, creating a continuous cycle of theoretical input followed by immediate practical application, substantially accelerating the formation of stable professional competencies [11].

• **Shared Pedagogical Authority:** The curriculum is co-developed by academic faculty and enterprise mentors, both holding formal instructional responsibility, ensuring that tacit workplace knowledge is systematically transferred within an accountable educational framework [8].

• **Competency-Referenced Assessment:** Graduate assessment is conducted against dual criteria — academic benchmarks and enterprise-defined professional standards — preventing the "credential inflation" phenomenon documented in systems relying solely on formal examination results [12].

Thus, adoption of the dual education system is not merely a scheduling adjustment but a fundamental shift from a "knowledge-delivery" to a "competency-construction" model, where the measure of success is the learner's demonstrated capacity to perform and adapt within real production environments [7].

The transition to a fully operational dual education model requires radical restructuring of the governance architecture between TLIs and enterprise partners. Existing administrative frameworks assign coordination to over-stretched deputy directors operating without contractual authority over partners or access to real-time labor market data [4]. Therefore, the core of the proposed organizational mechanism is the establishment of a Sectoral Coordination Council (SCC) — a permanent, legally empowered governance body with executive authority over dual program parameters including enterprise selection criteria, mentor certification standards, and curriculum allocation ratios.

Structurally, the SCC must represent the full spectrum of dual system stakeholders:

1. **Educational Sector:** Representatives from TLIs and the Agency for Vocational Education, to align dual program parameters with state educational standards and National Qualification Framework requirements.

Web of Discoveries: Journal of Analysis and Inventions
webofjournals.com/index.php/3

2. Industrial Sector: Representatives from sector-specific enterprise associations, to define competency targets, validate workplace mentor qualifications, and confirm the annual relevance of curriculum content.

3. State and Regional Bodies: Representatives from regional Khokimiyats and the Ministry of Employment, to administer financial incentives and resolve regulatory barriers impeding enterprise-TLI cooperation agreements.

The organizational innovation lies in the formal redistribution of curriculum authorship: TLIs submit vocational module frameworks to enterprise partners for annual validation, ensuring content is "backward engineered" from actual workplace competency requirements. The SCC additionally oversees Joint Training Centers — shared facilities co-funded by enterprise clusters and partner TLIs — eliminating duplicated equipment investment and increasing utilization of high-specification technical infrastructure.

The economic viability of the dual education system hinges on a balanced multi-stakeholder financing architecture. The proposed mechanism operates on the principle of Multi-Channel Financing, integrating three distinct streams [14]:

• **State Financing (Base Level):** Covers teacher salaries, institutional overhead, and state-approved curriculum frameworks, sustained through the Agency for Vocational Education's annual budget allocation cycles.

• **Enterprise Co-Investment (Targeted Level):** Enterprises commit resources toward mentor remuneration, trainee stipends, and training station maintenance, gaining preferential access to the graduating cohort as a hiring pool in exchange.

• **Innovation Fund (Commercial Level):** A dedicated fund co-administered by the SCC finances new competency module development, UDETP maintenance, and periodic equipment upgrades at Joint Training Centers.

Beyond conventional fiscal incentives — tax credits, priority procurement access, and expedited licensing — the mechanism introduces the "Competency Bond": a contractual instrument through which an enterprise pre-finances a student's final training year in exchange for a guaranteed post-graduation employment commitment. This instrument inverts conventional hiring risk: rather than enterprises absorbing uncertainty about graduate readiness, enterprise mentors directly verify competency development in real time throughout the program [15].

A crucial component of the proposed mechanism is the Unified Dual Education Tracking Platform (UDETP), which aggregates competency acquisition data from both academic and workplace assessment streams, providing real-time dashboard analytics to enterprise partners, TLI administrators, and SCC members. This data-driven approach minimizes waste associated with "competency redundancy" — classroom repetition of skills already mastered at the workplace — and with "competency gaps" caused by delayed institutional response to evolving labor market signals.

The implementation of the proposed mechanisms is projected to yield transformative results, based on comparative analyses of Germany's Berufsausbildung system [6] and Switzerland's vocational and professional education and training framework [12]:

• **Graduate Employment Rate:** Institutions with mature dual programs achieve enterprise-validated employment rates of 85–90% within three months of graduation, compared to an estimated national average of 55–60%, eliminating the "deadstock graduate" phenomenon.

• **Enterprise Training Cost Reduction:** Partner enterprises document reductions of 20–30% in post-hire onboarding costs relative to graduates of non-dual programs, reflecting the value of structured mentorship throughout the full study period.

• **Equipment Utilization Efficiency:** Joint Training Centers are projected to achieve utilization rates of 75–80%, compared to an estimated 35–45% for current TLI laboratory assets, reducing per-student infrastructure costs significantly.

While the theoretical argument is compelling, practical implementation faces significant "institutional friction." Three primary risks must be managed:

• **Enterprise Participation Resistance:** Many SMEs regard dual system participation as an administrative burden, particularly given the absence of fully developed legal frameworks for enterprise-TLI cooperation. Without well-designed incentives and SCC liaison support, the model risks concentration among large enterprises, replicating coverage inequalities of the existing practicum system [3].

•

• **Mentor Qualification Deficit:** Enterprise mentors are typically selected for occupational expertise rather than instructional capacity. Without a robust certification program delivered by the Institute for the Development of Professional Education, dual education risks reduction to de facto labor placement rather than a purposeful competency-formation process [4].

• **Regulatory Fragmentation:** System-wide implementation requires a coherent legal framework recognizing shared educational authority, adjusting state standards for dual time allocations, and establishing liability protocols for workplace incidents. Current provisions in Resolution No. 163 (2021) lack the comprehensive statutory architecture required [2].

In conclusion, the "Dual Education System" for Uzbekistan's TLIs is not merely a pedagogical innovation but a strategic necessity for developing a productive, competitive national workforce. It represents a shift from the "social expenditure" model — in which TLIs function as state-funded credential-issuing bodies — to an "investment return" model, wherein vocational education institutions serve as dynamic intermediaries between human capital formation and industrial productivity. The Sectoral Coordination Council and Joint Training Centers establish the governance infrastructure to align educational and industrial interests, while Multi-Channel Financing and the Competency Bond create the financial architecture for sustainable enterprise participation at the scale required for systemic transformation.

For the Agency for Vocational Education, the following strategic actions are recommended:

1. Establish a Regulatory Framework: Develop a comprehensive Law on Dual Vocational Education defining the legal rights and responsibilities of enterprise partners, shared curriculum authorship procedures, and quality assurance standards, substantially expanding Resolution No. 163 (2021) [2].

2. Launch Phased Pilot Programs: Initiate a dual education pilot in three to five high-demand sectors (e.g., construction, light industry, digital services) involving at least fifty TLIs and two hundred enterprise partners, with external evaluation to generate an evidence base for national scaling.

3. Develop a National Mentor Certification Program: Design a structured certification pathway for enterprise mentors, administered jointly by the Institute for the Development of Professional Education and sector enterprise associations, with defined competency standards and periodic recertification requirements [8].

4. Deploy the UDETP: Commission and implement the Unified Dual Education Tracking Platform as nationally standardized digital infrastructure, ensuring full interoperability with existing Education Management Information Systems of the Agency for Vocational Education. Ultimately, the success of the dual education system depends not on the sophistication of its regulatory architecture alone, but on the quality of the pedagogical alliance between the teacher at the institution and the mentor at the enterprise. Only through cultivating this partnership as a shared commitment to the learner's development can vocational education become a true driver of sustainable economic growth and social advancement in Uzbekistan.

References

1. O‘zbekiston Respublikasi Prezidentining Farmoni. Kasbiy ta‘limda malakali kadrlar tayyorlash tizimini yanada takomillashtirish va xalqaro ta‘lim dasturlarini joriy qilish chora-tadbirlari to‘g‘risida // Lex.uz. – 2024 y. 16 oktyabr. – PF-158-son.
2. O‘zbekiston Respublikasi Vazirlar Mahkamasining qarori. Kasbiy ta‘lim tizimida dual ta‘limni tashkil etish chora-tadbirlari haqida // Lex.uz. – 2021 y. 29 mart. – 163-son.
3. O‘zbekiston Respublikasining Qonuni. Ta‘lim to‘g‘risida // Lex.uz. – 2020 y. 23 sentyabr. – № 03/20/637/1313.
4. Ashurova S. Yu. Kasb-hunar kollejlarida o‘quvchilarni kasbiy faoliyatga ijtimoiy-psixologik jihatdan tayyorlashning pedagogik asoslari: Ped. fan. nomz. ... diss. avtoref. – Toshkent, 2009. – 24 b.
5. Billett, S. Learning through work: workplace affordances and individual engagement // Journal of Workplace Learning. – 2001. – Vol. 13, № 5/6. – P. 209–214.
6. Euler, D. Germany’s dual vocational training system: a model for other countries? // Bertelsmann Stiftung. – 2013.
7. Ismoilov A. A. Kasb ta‘limida dual o‘qitish tizimining mazmuni va uning ahamiyati // Zamonaviy ta‘lim. – 2018. – № 9 (70). – B. 29–34.

8. Muslimov N. A., Q‘o‘sinov O. A. Kasb ta‘limi o‘qituvchilarini tayyorlashda dual ta‘lim texnologiyasidan foydalanish // Ta‘lim texnologiyalari. – 2019. – № 4. – B. 80–85.
9. OECD. Learning for Jobs: OECD Reviews of Vocational Education and Training. – Paris: OECD Publishing, 2010.
10. Ollimov Q. T., Mirzaeva N. A. Kasbiy ta‘limda dual tizim: nazariya va amaliyot // Academic research in educational sciences. – 2021. – T. 2, № Special Issue 1. – B. 419–426.
11. Q‘o‘sinov O. A. Kasb ta‘limi o‘qituvchilarini tayyorlashda dual ta‘lim texnologiyalaridan foydalanishning metodik asoslarini takomillashtirish: PhD diss. avtoref. – Toshkent, 2020. – 48 b.
12. Rauner, F. Integrating Work and Learning: The German Dual System of VET as Potential Role Model? // Research in Comparative and International Education. – 2007. – Vol. 2, № 4. – P. 298–305.
13. Vygotsky, L. S. Mind in Society: The Development of Higher Psychological Processes. – Cambridge, MA: Harvard University Press, 1978. – 176 p.
14. Блинов В. И., Есенина Е. Ю., Сергеев И. С. Методика внедрения дуального обучения // Профессиональное образование и рынок труда. – 2017. – № 3. – С. 4–10.
15. Олейникова О. Н., Муравьева А. А. Становление и развитие систем дуального профессионального образования: опыт России и Германии // Вопросы образования. – 2016. – № 4. – С. 227–249.

Web of Discoveries: Journal of Analysis and Inventions
webofjournals.com/index.php/3