

NEW MODELS FOR THE CONTINUOUS PROFESSIONAL DEVELOPMENT OF SPECIAL SUBJECT TEACHERS AND MASTERS OF INDUSTRIAL TRAINING

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Abstract: The rapid transformation of the global industrial landscape, driven by the Fourth Industrial Revolution, has fundamentally altered the competency requirements for the vocational education workforce. This article critically examines the current state of professional development systems for the two primary pillars of vocational training: Special Subject Teachers and Masters of Industrial Training. The study argues that the traditional, episodic model of qualification upgrading—characterized by standardized courses occurring at fixed multi-year intervals—is structurally incapable of addressing the dynamic nature of modern technology and pedagogy. By synthesizing theories of andragogy, dual professionalism, and situated learning, this paper proposes a conceptual transition from “static retraining” to “continuous professional development” (CPD). The first part of this research establishes the theoretical framework, analyzing the distinct professional identity crises faced by theoretical instructors and practical masters, and articulates the urgent necessity for differentiated, workplace-integrated development models.

Keywords: Vocational Education and Training (VET), Continuous Professional Development (CPD), Dual Professionalism, Special Subject Teachers, Masters of Industrial Training, Workplace Learning, Industry 4.0, Andragogy, Industrial Immersion, Competence-Based Education, Pedagogical Mentorship.

In the contemporary discourse of human capital development, the quality of Vocational Education and Training (VET) is universally recognized as the decisive factor in national economic competitiveness. However, the efficacy of any VET system is ultimately contingent upon the competence of its pedagogical workforce. Unlike general education, where the core curriculum remains relatively stable, vocational education operates at the volatile intersection of technological innovation and labor market flux. This unique positioning places an extraordinary burden on the system’s dual workforce: the Special Subject Teachers, who are responsible for the theoretical scaffolding of professional knowledge, and the Masters of Industrial Training, who are tasked with the formation of practical skills and psychomotor habits. The central problem addressing policy-makers today is that the “half-life” of professional knowledge in engineering and technical fields has shrunk to less than five years, meaning that the static competence acquired by educators during their initial training becomes obsolete at an accelerating rate. Consequently, the traditional

paradigm of professional development, which relies on episodic, centralized, and standardized retraining courses, faces a systemic crisis of relevance.

The professional identity of the VET educator is inherently complex, described in academic literature as “Dual Professionalism.” This concept posits that a successful vocational educator must simultaneously possess high-level expertise in a specific vocational domain (e.g., mechatronics, agronomy, construction) and sophisticated pedagogical competence. However, a critical analysis of the current workforce reveals a significant dichotomy and fragmentation in how these competencies are maintained. Special Subject Teachers, typically recruited from university graduates, often possess strong theoretical foundations but suffer from “industrial alienation.” Their lack of regular exposure to the operational realities of modern enterprises leads to a “theory-practice gap,” where students are taught the physics of a machine but not its current industrial application. Conversely, Masters of Industrial Training, often recruited from the industry or from the cohort of skilled college graduates, frequently exhibit “pedagogical deficits.” While they possess tacit knowledge and manual dexterity, they often lack the methodological tools to articulate this knowledge, diagnose learning difficulties, or design differentiated instruction for diverse student groups.

The prevailing “episodic” model of professional development exacerbates these deficiencies rather than resolving them. By treating professional development as a discrete event that occurs once every few years in an isolated training center, the system fails to account for the principles of andragogy (adult learning). Research in cognitive psychology and organizational behavior suggests that for professionals, learning is most effective when it is “situated”—that is, embedded in the immediate context of their work and motivated by the need to solve real-world problems. When a Master of Industrial Training is removed from the workshop and placed in a lecture hall to listen to abstract pedagogical theory, the transfer of training is minimal. Similarly, when a Special Subject Teacher attends a refresher course that lacks access to the latest industrial equipment, their technical obsolescence is merely reinforced, not rectified. Thus, the existing mechanism creates a “competence illusion,” where educators are certified as “upgraded” without having acquired the functional agility required by Industry 4.0.

Furthermore, the lack of differentiation in development pathways for these two distinct categories of educators represents a significant strategic oversight. The developmental trajectory of a Special Subject Teacher requires a strong vector towards the industry—internships in production facilities, participation in R&D projects, and engagement with sectoral innovations. In contrast, the developmental trajectory of a Master of Industrial Training requires a vector towards the academy—mentorship in digital didactics, training in assessment psychology, and development of soft skills facilitation. The failure to unbundle these pathways leads to a “one-size-fits-all” approach that satisfies neither group. Therefore, the transition to new models

of Continuous Professional Development (CPD) is not merely an administrative adjustment but a fundamental pedagogical imperative. These new models must be characterized by continuity, personalization, and a deep integration of the “workplace as a learning space,” transforming the educator from a passive recipient of information into an active architect of their own professional evolution.

Building upon the theoretical necessity for a paradigm shift, the practical realization of continuous professional development requires the implementation of structurally differentiated yet functionally integrated models. The central methodological innovation proposed in this study is the abandonment of the “unitary trajectory” in favor of a “dual-track” system that addresses the specific professional deficits of the workforce. For **Special Subject Teachers**, whose primary challenge is the erosion of technical relevance, the “Industrial Residency Model” emerges as the most effective mechanism. Unlike traditional two-week observation tours, this model institutionalizes a “sandwich” approach where the teacher is embedded within an industrial enterprise for a significant period (e.g., one month per academic year) with specific operational responsibilities. This is not passive observation; it involves the teacher participating in the production cycle, mastering new machinery, and crucially, identifying the discrepancy between the college curriculum and the factory reality. This cyclical immersion ensures that the theoretical knowledge imparted in the classroom is constantly refreshed by the empirical data of the workshop, effectively closing the feedback loop between education and production. The academic validity of this model rests on the principle that technical expertise is perishable and can only be renewed through direct engagement with the technological source.

Conversely, for Masters of Industrial Training, whose dominance lies in craft skills but often lacks methodological sophistication, the “Pedagogical Mentorship and Micro-Credentialing Model” is proposed. This model rejects the premise that a Master needs a second degree in pedagogy; instead, it utilizes a “just-in-time” learning approach. It involves the creation of a tiered mentorship system where experienced methodologists work alongside Masters directly in the training workshops—a concept of “training the trainer at the bench.” This situates pedagogical learning within the context of the Master's daily work, transforming a specific instructional challenge (e.g., how to explain a safety protocol effectively) into a learning moment. Furthermore, this model is supported by a digital ecosystem of micro-credentials—short, focused modules on specific pedagogical skills (such as “Digital Assessment Tools” or “Conflict Resolution in the Workshop”) that the Master can complete asynchronously. This modularization allows for a flexible, personalized learning path that respects the Master's time constraints while systematically building their didactic competence. By validating these micro-competencies through digital badges rather than cumbersome diplomas, the system incentivizes continuous improvement and professional pride.

Ultimately, these distinct pathways converge in the “Collaborative Lesson Study” model, where a Special Subject Teacher and a Master of Industrial Training jointly design, deliver, and analyze a specific learning module. This collaborative model forces the integration of theory and practice at the planning stage. The Teacher brings the conceptual framework, the Master brings the practical nuance, and their joint reflection on the lesson outcomes serves as a powerful engine for mutual professional development. This approach shifts the locus of professional development from the external training center back to the educational institution itself, transforming the college into a “Learning Organization” where professional growth is an intrinsic part of the institutional culture rather than an extrinsic bureaucratic requirement. The integration of these models—Industrial Residency for technical currency, Pedagogical Mentorship for methodological rigor, and Collaborative Lesson Study for synthesis—forms a robust, multi-dimensional architecture capable of sustaining the high-performance workforce required by the modern vocational education sector.

The transition from a static, centralized model of professional qualification improvement to a dynamic, continuous, and differentiated system represents a fundamental restructuring of the human capital management strategy within the vocational education sector. The implementation of the proposed “Industrial Residency” for Special Subject Teachers and the “Pedagogical Mentorship” for Masters of Industrial Training is projected to yield significant qualitative and quantitative transformations at both the institutional and macroeconomic levels. Primary among these expected outcomes is the substantial reduction of the “relevance gap” that currently exists between the competencies taught in vocational colleges and the operational requirements of the labor market. By institutionalizing the cyclical immersion of teachers in the industrial environment, the educational system creates a self-correcting mechanism where curriculum obsolescence is identified and rectified in real-time, rather than after a multi-year lag. This ensures that the “instructional currency” of the teaching workforce remains high, directly translating into increased employability for graduates who enter the workforce with skills that are immediately applicable, thereby reducing the retraining costs currently borne by employers.

Furthermore, the introduction of these new models is anticipated to have a profound impact on the professional motivation and retention of the VET workforce. The traditional “deficit model,” which views professional development as a remedial activity to fix inadequate performance, often leads to disengagement and a lack of professional agency. In contrast, the proposed “growth model,” particularly the use of micro-credentials and collaborative lesson studies, empowers educators by validating their diverse skill sets and offering flexible pathways for career advancement. For Masters of Industrial Training, the acquisition of recognized pedagogical competencies elevates their status from mere instructors to professional educators, fostering a stronger sense of professional identity and reducing the high

turnover rates often observed in this category. Economically, while the implementation of these models requires an initial investment in organizational logistics and substitute staffing during industrial residencies, the long-term Return on Investment (ROI) is favorable. The cost of maintaining an irrelevant education system is structurally higher than the cost of maintaining a continuous development system, as the latter generates value through higher labor productivity and innovation diffusion.

However, the successful realization of this paradigm shift necessitates a robust and synchronized policy response from the governing bodies of vocational education. It requires the development of a supportive normative-legal framework that formally recognizes workplace-based learning and micro-credentials as valid equivalents to traditional certification courses for the purposes of salary categorization and career progression. Specifically, legislation must be adjusted to allow for “industrial sabbaticals” without loss of seniority or benefits, and to create fiscal incentives for enterprises that host teachers for these residencies. The Agency for Vocational Education must evolve from a regulator of compliance into a facilitator of capacity building, establishing the digital infrastructure required to track and accredit these diverse learning experiences. In the final analysis, the modernization of the material-technical base of vocational education is futile without the simultaneous modernization of its human resources. The educator remains the central variable in the quality equation; therefore, building a continuous, differentiated, and industry-integrated professional development system is not merely an educational objective but a strategic economic imperative for the nation’s industrial future.

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