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Value · Relations · Process: the triple reconstruction of the practice philosophy of the Great Production Movement in the Border Regions and multi-base platforms for engineering education

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Abstract. At present, the reform of engineering education practice is undergoing a paradigm shift from "coordination" to "symbiosis". However, in operation, multi-base sequential platforms are confronted with structural dilemmas, including the suspension of core values, weak interconnection among participating entities, and fragmentation between knowledge and practice. To address these issues, this study returns to the "Great Production Movement in the Border Regions", a Chinese adaptation and exemplary practice of the Marxist principle of integrating education with productive labor, and conducts a historical decoding of its underlying philosophy of practice. The study proposes that "value anchoring" should be employed to reaffirm the original mission of education, "relational symbiosis" to reconstruct governance structures, and "process integration" to connect curricular systems, thereby enabling a paradigm transformation of engineering education practice platforms from instrumental arrangements to educational communities. Theoretically, this research provides historical legitimacy and intellectual resources for constructing an engineering education model with Chinese characteristics. Practically, it offers a logical framework for universities to reconstruct communities of practice-oriented education.

Keywords: Great Production Movement in the Border Regions, philosophy of practice, engineering education, educational community, triple reconstruction

1. Introduction

In January 2025, the Central Committee of the Communist Party of China and the State Council issued the *Outline of the Plan for Building a Leading Country in Education (2024–2035)*, explicitly calling for "strengthening the integration of education with productive labor", "improving the quality of engineering master's and doctoral training", and "refining mechanisms for the integration of science and education and the coordinated cultivation of talent through industry–education collaboration" [1]. This policy orientation has once again placed the Marxist educational principle of integrating education with labor at the forefront of educational reform. However, a closer examination of current practices in engineering education reveals that,

although "multi-base sequential" platforms have expanded in both scale and number, they are increasingly confronted with deep-seated structural dilemmas. At the level of values, the fundamental goal of "cultivating talent for the nation" is being overshadowed by a narrow focus on the delivery of technical skills. At the organizational level, the tripartite relationship among universities, enterprises, and students has devolved into a network of resource exchange governed primarily by contractual calculations. At the procedural level, the fragmentation among different bases has led to a spatiotemporal disjunction between knowledge and practice. Notably, existing studies have largely concentrated on institutional design and technological empowerment [2], with relatively little reflection from the perspective of Marxist philosophy of practice or through the lens of indigenous Chinese educational paradigms. In fact, the "Great Production Movement in the Border Regions" of the 1940s, as an early Chinese adaptation of the Marxist principle of integrating education with productive labor, established a tripartite community of learning and production encompassing intellectuals, workers and peasants, and cadre trainees. This movement embodied rich practical philosophy and organizational wisdom. Some scholars have pointed out that the movement, by transforming intellectual labor into productive labor, provided intellectuals with a distinctive practical context and ideological space [3]. This historical experience suggests that the deep-rooted dilemmas facing contemporary engineering education practice platforms may need to be addressed at the level of the philosophy of practice. Accordingly, this paper decodes the practical philosophy embedded in the Great Production Movement in the Border Regions from the three dimensions of value, relations, and process, and explores its contemporary implications for the construction of multi-base platforms.

2. Decoding the prototype: the philosophy of practice and organizational wisdom of theGreat Production Movement in the Border Regions

As an early paradigm of the Sinicization of Marxist educational thought, the Great Production Movement in the Border Regions embodies profound intellectual resources for practice-oriented education. Comrade Mao Zedong's call to "rely on our own efforts and achieve self-sufficiency" was not merely a response to material hardship, but also a profound articulation of the epistemological primacy of practice [4]. Its distinctive significance lies in transforming the principle of integrating education with productive labor from a theoretical proposition into an effective organizational model and operational mechanism. The "trinity" model of education, scientific research, and production implemented at the Yan'an Natural Science Institute serves as a vivid illustration of this transformation [5]. The following section systematically decodes the philosophy of practice embedded in this historical prototype, along with its generative mechanisms, from three dimensions: core, form, and spirit.

2.1. Core: an initial exploration of the sinicization of the marxist view of practice

The Great Production Movement in the Border Regions was by no means a provisional economic policy; rather, it represented an original manifestation of the Marxist conception of practice within the Chinese context. The reason this movement transcended the domain of mere material production and evolved into an educational paradigm lies in its ontological commitment to the primacy of practice. In Theses on Feuerbach, Marx clearly states that "all social life is essentially practical" [6]. This proposition found its embodied expression in the seemingly simple slogan "rely on our own efforts and achieve self-sufficiency" during the movement. The deeper implication of the eight characters inscribed by Mao Zedong for *Nanniwan* lies in emancipating practice from its subordinate position within epistemology—practice was no longer regarded as the "application" or "verification" of theory, but as the fundamental mode through which human beings affirm

their existence and overcome conditions of material deprivation [7]. When the officers and soldiers of the 359th Brigade advanced into what was then known as "Mud Bay" under conditions of extreme scarcity —"almost no clothes to wear and no oil to consume"—their land reclamation activities were not merely acts of material production. Rather, they constituted a form of existential self-redemption. In the process of opening up wasteland, the soldiers integrated the study of Marxism–Leninism with productive labor and put forward the slogan "turning military camps into schools" [8]. This represents a creative realization of the principle of integrating education with productive labor under extreme conditions. Its underlying logic offers principled insights for contemporary engineering education, particularly regarding how "real problems" may be embedded into practical teaching. More profoundly, the movement effected a fundamental inversion of educational teleology. In his 1943 speech *Get Organized*, Mao Zedong emphasized the need to mobilize "all the strength of the people, all the strength of the army, government organs, and schools" and to organize them, without exception, into a "great labor force" [9]. This assertion is consistent with the earlier policy established during the Central Soviet Area period that education should "serve revolutionary war and production development". Here, the idea that education serves war and production is not a utilitarian expedient; rather, it represents a re-foundation of the essence of education itself. The legitimacy of education no longer derives from the transmission of abstract truths, but from its capacity to achieve a deep unity with "national needs" and "people's livelihood". A concrete example of this unity can be found in the *Outline for Teaching Political Courses in Winter Schools* compiled by the Jinxi–Northwest Administrative Office, which integrated the theory of protracted war with practical knowledge of production. This integration reveals the essence of Marxist educational thought: the all-round development of human beings can only be realized through the process of addressing "real problems" in practice, rather than through abstract intellectual training detached from reality.

2.2. Form: the "trinity" model of practice-oriented education

The Great Production Movement in the Border Regions transcended the bounds of mere material production primarily because it pioneered a "trinity" model of practice-oriented education. Through the organic integration of three dimensions—spatial convergence, subject symbiosis, and the cyclical unity of knowledge and action—this model achieved a deep fusion of labor and education, as well as production and learning. First, at the spatial level, the coexistence of "school-run factories" and "factory-run schools" broke down both physical and institutional boundaries. As exemplified by the "integration of production, combat, and learning" formed during the Nanniwan reclamation undertaken by the 359th Brigade [10], sites of production simultaneously became sites of education, and tools of labor were transformed into pedagogical instruments. This spatial convergence provided the material foundation for the implementation of practice-oriented education. As Marx incisively observed, "from the factory system there buds forth the germ of the education of the future, an education that will combine productive labor with intellectual and physical training for all children beyond a certain age, not only as a method of increasing social production, but as the only method of producing fully developed human beings" [11]. The Great Production Movement in the Border Regions represents precisely the Sinicized realization of this principle. Second, in terms of subject relations, intellectuals, workers and peasants, and cadre trainees formed a genuine "learning–production community" through collective labor. Mao Zedong emphasized in *Economic and Financial Problems* that it was necessary to mobilize "all the strength of the people, all the strength of the army, government organs, and schools, and all available full and semi-labor power, regardless of gender or age, and organize them into a great labor force" [12]. This organized mobilization dismantled the traditional class division between "those who work with their minds governing others and those who work with their hands being governed" [13], enabling different groups

to learn from one another in the process of shared labor: intellectuals acquired practical experience from workers and peasants; workers and peasants gained cultural enlightenment from intellectuals; and cadre trainees enhanced their leadership capacities through their dual roles. Leading figures such as Chen Yun and Zhang Wentian personally participated in productive labor, with Zhang Wentian encouraging students at the Marxism–Leninism Institute to adopt flexible arrangements such as "studying in the morning and engaging in production in the afternoon, or working one day after three to five days of study", thereby achieving a balance between mental and manual labor. This vividly illustrates the essence of symbiotic subject relations. Finally, at the level of process mechanisms, this model established a rapid iterative cycle of "problem identification – knowledge acquisition–practical resolution–reflective synthesis". The Great Production Movement translated this principle into a concrete educational methodology: when soldiers encountered shortages of tools during land reclamation, they learned blacksmithing skills to forge their own implements; when faced with insufficient fertilizer, they organized composting competitions, accumulated experience through practice, and disseminated effective methods. Mao Zedong summarized this approach as the method of "from the masses, to the masses", emphasizing that "production, interests, experience, and sentiments of the masses are matters that leading cadres must constantly attend to". This cyclical integration of knowledge and action ensured that each completed production task simultaneously constituted the completion of an educational process, and each resolved practical problem facilitated an elevation in cognitive capacity. In this way, the principle of integrating education with productive labor was genuinely realized. Viewed in this light, the "trinity" model of practice-oriented education is not an accidental institutional arrangement, but a concrete manifestation of the Marxist philosophy of practice in the educational domain. Its internal logic provides an important historical reference for the construction of contemporary engineering education practice platforms.

2.3. Spirit: the formation of the "red spirit of practice"

The "red spirit of practice" nurtured during the Great Production Movement in the Border Regions is not an external moral appendage to the labor process; rather, it represents the spiritual sublimation and ethical crystallization of the philosophy of practice within a specific historical context. It embodies a logic of creative transformation—from "seeking truth from facts" to "improvising with indigenous methods"—as well as a deep structural alignment between the ethics of perseverance, service to the people, and the labor process itself. This spirit first manifested as a form of creative transformation driven by material scarcity. In the face of extreme deprivation—"almost no clothes to wear, no oil to consume, no paper, and no vegetables" [14]—mere adherence to "seeking truth from facts" could only diagnose the predicament; only by advancing toward "improvisation with indigenous methods" could a path forward be forged. As some scholars have noted, due to the severe shortage of production materials, designers within the Eighth Route Army were compelled to "fully exploit the potential of existing materials", creating various locally adapted "indigenous products" through substitution and innovation. This transition from "seeking truth from facts" to "improvising with indigenous methods" vividly exemplifies Mao Zedong's insight that "hardship offers an opportunity for Communists to temper their abilities". It reflects not only respect for objective conditions, but also an active transcendence grounded in that respect, embodying the dialectic of practice as a movement "from the realm of necessity toward the realm of freedom". More profoundly, this creative transformation was always intertwined with the value ethic of "serving the people". Mao Zedong pointed out that "a firm and correct political orientation cannot be separated from a style of hard struggle" [15], indicating that perseverance is not a passive endurance akin to asceticism, but an active commitment to solving real problems and serving national needs. When the 359th Brigade stipulated that "the products of production must be enjoyed by the masses" [16], and when central leaders personally engaged in land reclamation and spinning, the labor process ceased to be merely a

means of subsistence. Instead, it became an activity of value realization undertaken "for the fulfillment of the Party's political tasks". It is precisely this characteristic—where value ethics are embedded within the labor process—that elevates the red spirit of practice beyond the technical question of "how to act" to a level of value consciousness concerning "why to act". This historically grounded experience of "value anchoring" provides a foundational intellectual resource for addressing the contemporary dilemma of weakened value orientation in engineering education.

3. Diagnosing the dilemma: deep challenges of contemporary "multi-base sequential" practice platforms

The practical wisdom embodied in the historical prototype provides a critical reference point for examining present-day challenges. When the organically unified vision of "education–production–life" in the Great Production Movement is juxtaposed with the operational reality of contemporary "multi-base sequential" platforms in engineering education, the underlying structural tensions become readily apparent: why does the essence of education face the risk of erosion even as organizational forms grow increasingly complex? Academician Kuangdi Xu once sharply warned that the greatest danger in engineering education is "running machines on the blackboard", a critique that directly targets the deep-rooted problems of formalism and instrumentalism in practical teaching. The following section diagnoses these structural dilemmas from three interrelated dimensions: value, relations, and process.

3.1. The value dilemma: from "all-round human development" to "technical skill delivery"

The most fundamental predicament of contemporary "multi-base sequential" practice platforms lies in the narrowing of educational objectives and the "suspension" of value guidance. In the *Economic and Philosophic Manuscripts of 1844*, Marx profoundly observed that the essence of human beings lies in "appropriating their comprehensive essence in a comprehensive manner—that is, as a whole person" [17], and that "animal production is one-sided, whereas human production is universal" [17]. This proposition reveals that the ultimate aim of education should be the all-round development of the individual, rather than the acquisition of isolated skills. However, an examination of current platform operations indicates that the goal of "education" is increasingly being overshadowed by the demands of "employment". Enterprises participating in practical teaching tend to prioritize the immediate alignment of students' competencies with job requirements; universities, in collaborative arrangements, often acquiesce—implicitly or explicitly—to the utilitarian logic of skills training; and students, circulating between "bases" and campuses, are gradually reduced to "pre-assembled components" for the labor market. The deeper logic of this value shift lies in the subtle transformation embedded within the operational design of these platforms—from fostering "all-round human development" to facilitating "technical skill delivery". As Marx criticized, the capitalist mode of production confines individuals to "a particular partial operation" [18]; similarly, contemporary engineering education, under the strong pull of employment-oriented imperatives, risks degenerating into a "assembly-line" model of talent cultivation [2]. The consequence is the "suspension" of value guidance. Core elements such as the red spirit of practice, commitment to the nation, and engineering ethics—elements that should be intrinsically embedded throughout the entire process of practice—are often reduced to ceremonial rhetoric in opening speeches or decorative statements in final reports. They fail to penetrate the substantive interactions among universities, enterprises, and students. When "solving real problems" is reduced to "mastering practical skills", and when "serving national needs" is subordinated to "meeting enterprise demands", the platform ceases to function as an educational space aligned with the Marxist ideal of integrating productive labor with intellectual

and physical development. Instead, it devolves into a mere network for the exchange of technical skills. At its core, this value dilemma reflects a deviation from Marx's central proposition of "the free and all-round development of human beings", and a practical suspension of the fundamental stance that education should serve the people.

3.2. The relational dilemma: from a "community of life" to a "network of resource exchange"

In contemporary "multi-base sequential" practice platforms, the tripartite relationship among universities, enterprises, and students has degenerated from what Marx described as a "real community" into a loosely connected network of resource exchange governed by contracts and instrumental calculations. As a result, symbiotic relations have become fragile, and the formation of a genuine educational synergy is increasingly difficult. In *The German Ideology*, Marx emphasized that a true community is one in which "individuals attain their freedom in and through their association", the essence of which lies in organic intersubjective symbiosis rather than mechanical aggregation [17]. However, under the dual influence of capital logic and technological rationality, contemporary industry–education integration has undergone a significant distortion. Empirical studies indicate that such collaborative systems often fail to achieve genuine multi-agent co-governance: universities prioritize academic outputs, while enterprises focus on economic returns, resulting in misaligned objectives and superficial cooperation that frequently culminates in nominal "affiliation agreements" [19]. This externally driven alliance, grounded in interest-based calculation, has reduced what ought to be a "community of life" to a utilitarian "network of resource exchange". Universities treat enterprises as outlets for graduate employment; enterprises regard students as a source of temporary labor; and students, in turn, view practice bases as stepping stones for résumé enhancement. Professor Chunqing Yuan, in developing symbiosis theory, pointed out that the stability of a symbiotic system depends on whether a "continuous, stable, and balanced" pattern of energy distribution can be established among its constituent units [20]. This insight, derived from ecological theory, resonates across time and space with the organizational philosophy of the Communist Party of China's "mass line". Both converge on a fundamental question: how can heterogeneous actors, through shared activity, evolve into a genuine "community of life"?

3.3. The process dilemma: from the unity of knowledge and action to their spatiotemporal disjunction

At the process level, the operational difficulties of contemporary "multi-base sequential" practice platforms are manifested in the dual disjunction of "knowledge" and "action" across both temporal sequences and spatial settings. In essence, this reflects the operational alienation of the Marxist principle of integrating education with productive labor. In Volume I of *Capital*, Marx argued that the integration of productive labor with intellectual and physical education "is not only a method of increasing social production, but the only method of producing fully developed human beings" [21]. This proposition underscores the processual and holistic nature of "integration": knowledge and action should be organically unified within the process of human development. Yet, in current practice, multi-base platforms artificially fragment this unity. Spatially, they divide on-campus cognitive bases, enterprise training sites, and research and innovation centers into isolated physical units; temporally, they segment theoretical instruction, workplace internships, and project-based research into disconnected stages. A text analysis based on 66,371 student internship journals reveals that students commonly experience a dual predicament of "knowledge dislocation" and "workplace barriers", with a significant temporal lag and structural mismatch between academic theory and practical job requirements [22]. Further empirical studies indicate that most postgraduate students participate in only one or two short-term internships before graduation, lacking systematic exposure to the full product development cycle.

Consequently, enterprises often need to invest an additional six to twelve months in retraining after recruitment [23]. Such "fragmented" arrangements of practice lead to profound cognitive disorientation: students learn theory in academic settings without understanding its practical application; they perform operational tasks in production environments without grasping underlying principles; and they engage in innovation activities without a solid foundational grounding. Engels, in *Dialectics of Nature*, emphasized that "labor is the primary basic condition for all human existence" [24], implying that labor practice should constitute a continuous and integrated life activity. However, when the logical disjunction among different bases fragments continuous productive labor into isolated "practice sites", and when the disconnection between educational processes and production workflows reduces the dialectical unity of "knowledge and action" to a linear sequence of "learning first, doing later", practice-oriented education devolves from the process of all-round human development envisioned by Marx into a mechanized pipeline for skill transmission. What students ultimately acquire are merely disconnected "operational fragments," rather than an integrated body of "practical wisdom".

4. Reconstructing the path: rethinking contemporary engineering education practice platforms through the historical prototype

The threefold dilemmas outlined above reveal a deeper disorientation in contemporary engineering practice education under the expansion of instrumental rationality. The way forward lies precisely in returning to the historical experience of the Great Production Movement in the Border Regions and drawing from it foundational wisdom that transcends purely technical logic. As Marx observed, "the problem is the slogan of the age—it is the most practical expression of its state of mind". Only by transforming the axiology, organizational logic, and methodology embedded in the historical prototype into concrete responses to contemporary challenges can a genuine transition be made from diagnosing dilemmas to reconstructing pathways. The following section elaborates its contemporary implications from the three dimensions of value, relations, and process.

4.1. Value reconstruction: anchoring the original mission of practice-oriented education in "cultivating talent for the nation"

For contemporary "multi-base sequential" practice platforms to overcome the instrumental trap of "technical skill delivery", they must return to the foundational values of practice-oriented education. Specifically, "solving real problems and serving national needs" must be established as the meta-objective guiding platform construction, with the red spirit of practice serving as the cultural core permeating the entire process of technical instruction. The historical experience of the Great Production Movement offers a profound point of reference. Its call to "rely on our own efforts and achieve self-sufficiency" was not merely an economic strategy to address material scarcity; rather, it represented a philosophical elevation of the primacy of practice to both epistemological and existential dimensions, thereby establishing the fundamental principle that education should serve war and production [25]. Marx, in *Capital*, had already made clear that the integration of productive labor with intellectual and physical education is not only a means of enhancing social productivity, but also "the only method of producing fully developed human beings" [26]. The distinctive achievement of the Great Production Movement lies in its Sinicization of this principle. Intellectuals and cadre trainees, through real labor such as spinning, weaving, and land reclamation, not only acquired practical skills necessary for survival, but also underwent a process of value refinement and subjectivity reconstruction through their integration with workers and peasants. From the Wu Manyou model to the Zhao Zhankui

campaign, historical practice in the border regions demonstrates that when technical instruction is deeply rooted in the value framework of "laboring for the revolution", labor ceases to be a mere means of subsistence and becomes a crucible for transforming human consciousness. By contrast, if contemporary engineering education practice platforms remain confined to skill training while suspending value guidance, they fundamentally deviate from the authentic spirit of the Marxist principle of integrating education with labor. Only by taking "cultivating talent for the nation" as the meta-objective, aligning platform construction with the resolution of critical technological bottlenecks and the service of national strategic needs, and enabling students to internalize the red spirit of self-reliance and perseverance through engagement with real engineering challenges, can a deep integration of technical instruction and value formation be achieved. Such a re-anchored value foundation would allow practice platforms to transcend the market logic of resource exchange and return to the educational mission of fostering the all-round development of human beings.

4.2. Relational reconstruction: building a symbiotic governance structure driven by both "value" and "interest"

To address the fragmentation of collaboration among stakeholders in contemporary multi-base engineering education platforms, it is essential to reconstruct the underlying governance logic. The historical insight for this transformation can be found in the mass line and collective labor practices embodied in the Great Production Movement in the Border Regions. Mere resource exchange or contractual linkage can only produce fragile, short-term alignments of interest; a durable and effective educational synergy requires a dialectical unity of "shared interests" and "shared activity". Marx pointed out that "all that men strive for is connected with their interests" [17], revealing that interest is the fundamental driver of cooperative action. However, when interests are confined to the level of resource exchange, collaboration remains superficial and unstable. The organizational wisdom of the Great Production Movement demonstrates that collective labor, as a form of shared practice, can transform dispersed individuals into an integrated "learning–production community". Engels, in emphasizing that "the working people create everything", highlighted the central role of laboring masses in both material and spiritual production [27]. This insight suggests that platform governance must enable universities, enterprises, students, and mentors to form an interdependent organic whole through joint engagement in solving real engineering problems. Lenin further observed that the strength and discipline of a proletarian party depend on its ability to maintain close ties with the broad masses, even to the extent of "becoming one with them". This notion is not merely rhetorical; it calls for institutional arrangements in which all parties "work together and share responsibility". Drawing on the methodology of the mass line, contemporary platforms should establish organizational linkages—such as joint Party branches—that translate political advantages into governance effectiveness. In doing so, diverse actors can be aligned under shared goals, enabling not only the distribution of benefits but also the co-assumption of educational responsibilities. Recent practices have shown that university–enterprise collaboration through "joint Party-building" initiatives can create sustained organizational cohesion by deeply integrating ideological work with professional development. This represents a meaningful attempt to embed value guidance within interest-driven mechanisms. Through such reconstruction, the platform can evolve from a loose network of resource exchange into a symbiotic governance structure jointly driven by value and interest, thereby achieving an organic unity between a "community of shared educational responsibility" and a "community of shared innovation benefits".

4.3. Process reconstruction: designing a sequential curriculum system based on a "real project chain"

The root cause of the disjunction between knowledge and action in contemporary engineering education lies in the failure to translate the physical linkage of multiple bases into a logically integrated educational process. As a result, students are unable to achieve a cyclical progression from theoretical cognition to practical competence within fragmented learning environments. Resolving this issue requires a return to the foundations of Marxist epistemology. The methodological principle of "ascending from the abstract to the concrete" is not an autonomous movement of thought, but must be realized through material labor that transforms the objective world. The Great Production Movement provides a vivid illustration of this principle: concrete production tasks such as spinning and land reclamation organically connected classrooms, workshops, and battlefields, enabling learners to encounter real problems through hands-on practice and to acquire genuine knowledge through active reflection. This process generated a spiral trajectory of "practice → cognition → renewed practice → deeper cognition". Drawing on this historical prototype, the linkage among multiple bases should not remain at the level of spatial coordination through formal agreements. Instead, following the task-driven logic of the Great Production Movement, complex engineering problems or innovation projects should serve as the central organizing axis. Different bases should be restructured into a sequential "chain of practice stages", each constituting a necessary link in the completion of a project. Examples include project-based teaching models in which real research projects span the entire undergraduate period, or practice training chains structured around the development of specific engineering systems. In such models, students progressively engage in cognitive observation, specialized training, and integrated innovation while solving a series of interconnected, increasingly complex tasks. This project-chain-based curriculum design effectively translates the educational principle of the unity of knowledge and action into an operational training process. Knowledge acquisition is no longer a preparatory stage preceding action, but becomes an intrinsic component of action itself; transitions between bases are no longer mere changes of setting, but natural extensions of problem-solving processes. As Mao Zedong stated in *On Practice*, "dialectical materialist epistemology places practice in the primary position" [28]. Only through sustained engagement in continuous, real-world project work can students achieve the transformation from perceptual knowledge to rational understanding, and further from rational understanding to transformative practice. In this way, the educational objectives of engineering education can be firmly grounded in the dynamic, iterative advancement of the unity of knowledge and action.

5. Conclusion and discussion

The Great Production Movement in the Border Regions, with its emphasis on the primacy of practice in axiology, deep integration in organizational logic, and the unity of knowledge and action in methodology, offers a distinctly Chinese intellectual resource for addressing the instrumentalization, fragmentation, and superficiality that currently afflict engineering education practice platforms. The validity of this conclusion is grounded in the internal logic of Marxist philosophy of practice. Marx explicitly noted that the integration of productive labor with intellectual and physical education is not only a means to enhance social productivity, but also "the only method of producing fully developed human beings" [21]. The Great Production Movement represents an early institutionalized realization of this principle within the Chinese context: it elevated "self-reliance and self-sufficiency" from a survival strategy to an educational philosophy, and achieved a profound alignment between educational objectives and national needs through the principle that education should serve war and production. The contemporary dilemmas of engineering education—namely the suspension of value

guidance, the looseness of multi-subject collaboration, and the disjunction between knowledge and action—ultimately stem from the erosion of the ontological status of practice. Instrumental rationality has displaced the Marxist educational meta-value of "the all-round development of human beings". In this regard, the theoretical contribution of this study lies in facilitating a cross-disciplinary dialogue among Marxist educational thought, Party history research, and engineering education studies. It elevates the issue of industry–education integration from the operational domains of management and pedagogy to the level of historical philosophy. As demonstrated by the experience of revolutionary base areas, genuine "integration" is not an external aggregation of resource-exchange networks, but a living connection in which intellectuals, workers and peasants, and cadre trainees form a "learning–production community" through shared labor. The report of the 19th National Congress of the Communist Party of China called for "deepening the integration of industry and education and strengthening school–enterprise cooperation" [29]. This study contributes to that national strategy not merely by proposing an operational framework, but by providing a principled foundation that endows the "Chinese model of engineering education" with both historical legitimacy and philosophical grounding. Its practical implication lies in revealing to university administrators a value orientation that transcends managerial techniques: when platform construction is anchored in the meta-objective of "solving real problems and serving national needs", and when the spirit of red practice is internalized as a cultural–cognitive element within institutional design [30], engineering education can move beyond being a "technical skill delivery line" and return to its original mission of cultivating talent for the nation. Future research may focus on empirical case studies of representative universities, employing longitudinal observation of multi-base platform development, quantitative evaluation of school–enterprise collaboration outcomes, and pre- and post-assessment of students' practical competencies. Through such iterative validation in practice, the contemporary relevance of the historical prototype can be further substantiated with robust empirical evidence.

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