

Reshaping the Dual-Qualified Teaching Workforce through Art-Engineering Integration under Institutional Consolidation

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How to cite this paper: Chen, D. (2026). Reshaping the Dual-Qualified Teaching Workforce through Art-Engineering Integration under Institutional Consolidation. *International Journal of Educational Development*, 4(3), 21–26. ISSN Print: 3104-4263, ISSN Online: 3104-4271.

<https://doi.org/10.63313/IJED.9112>

Published: 2026-09-16

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Abstract

Institutional consolidation involves more than the redistribution of educational resources; it also requires the systematic reconstruction of teacher standards, competency structures, and professional-development mechanisms. Using the incorporation of Yiyang Senior Technical School into Hunan Arts and Crafts Vocational College as the practice setting, this study examines the challenges technical-school teachers face in adapting to higher-vocational qualification requirements, curriculum development, teaching and research, and cross-disciplinary collaboration. The analysis identifies three interrelated dimensions of teacher transformation—standards transition, competency reconstruction, and boundary restructuring—and develops five pathways centered on certification-education-position alignment, art-engineering-teaching collaboration, curriculum-research-industry linkage, competition-training-evaluation coupling, and master-teacher-team-mechanism coordination. Case evidence shows that 97 of 101 transferred full-time teachers (96%) were recognized as dual-qualified, while the excellent rate in student evaluations of teaching rose from 68% to 94.2%. These findings suggest that dual-qualified teacher development should move beyond credential compliance toward competency enhancement, organizational empowerment, and sustained industry-education collaboration, thereby building a durable ecosystem for professional growth.

Keywords

Institutional Consolidation; Dual-Qualified Teachers; Art-Engineering Integration; Teacher Development; Vocational Education

1. Introduction

Vocational education has entered a new stage in which quality and efficiency improvement are pursued alongside structural optimization, and the focus of teaching workforce development has gradually shifted from staff expansion to

quality enhancement. The Ministry of Education's institutional arrangements for recognizing "dual-qualified" teachers in vocational education emphasize the integration of professional ethics, education and teaching competence, and professional practical competence within a unified standards framework [1]. The Outline for Building a Leading Country in Education (2024–2035) further places the construction of a high-quality vocational education system and a highly competent teaching workforce in a prominent position within China's agenda for building a strong education system [2]. Existing research indicates that "dual qualification" is not a simple combination of a teaching certificate and a vocational skills certificate; rather, it reflects the integrated development of pedagogical competence, technical and practical competence, and cross-boundary collaborative competence [3]. When a technical school is incorporated as a whole into a higher vocational college, its teachers face more than a mere "change of credentials": they must undergo a comprehensive transition in institutional identity, teaching norms, and modes of knowledge production. The consolidation of Hunan Arts and Crafts Vocational College and Yiyang Senior Technical School features a distinctive complementarity between "art and design + intelligent manufacturing," providing a representative case for examining how teachers can build on skill-based strengths to develop higher-vocational and composite professional capabilities.

2. Practical Logic of Reconstructing a Dual-Qualified Teaching Workforce during Institutional Consolidation

The integration of teaching staff after institutional consolidation is, in essence, a reorganization of different educational traditions, evaluation standards, and professional cultures. Only by situating teacher transformation within the shared framework of higher vocational talent cultivation, program-cluster development, and industry services can institutions avoid superficial consolidation in which "the schools have merged, but the teaching staff have not truly integrated."

2.1. Standards Transition: From Identity Conversion to Normative Alignment

Teachers in technical schools have long accumulated teaching experience centered on skills training and job-oriented operations, whereas higher vocational education imposes more comprehensive requirements concerning teacher qualifications, curriculum standards, credit management, instructional design, and quality evaluation. Therefore, the primary task of transformation is not to mechanically accumulate certificates, but to establish a professional identity aligned with higher vocational positions through qualification recognition, academic upgrading, professional ethics training, and systematic study of teaching norms. This responds to the standardized development requirements for dual-qualified teachers while also establishing a clear foundation for subsequent competency development.

2.2. Competency Reconstruction: From Strong Hands-On Skills to Integrated Teaching, Research, Training, and Service

Technical-school teachers have clear strengths in equipment operation, process training, and on-site guidance, but are relatively weaker in curriculum development, digital teaching, textbook development, and the transformation of research outcomes. The professional development of vocational education teachers requires coordinated development of vocational, pedagogical, and academic attributes [4]. Institutional consolidation should therefore preserve teachers' existing technical strengths while strengthening their capacities in teaching research, technological R&D, and social services, enabling them to evolve from single-purpose practical-training instructors into composite teachers capable of integrated development in teaching, research, training, and service.

2.3. Boundary Restructuring: From Separation of Art and Engineering to Cross-Boundary Symbiosis

Before consolidation, art and design teachers and intelligent manufacturing teachers belonged to different professional cultures, with differences in teaching language, project logic, and outcome evaluation. Yet industrial scenarios such as new-product development, digital manufacturing, and intelligent cultural-creative production inherently require collaboration between design thinking and engineering technology. Accordingly, the development of dual-qualified teachers cannot remain confined within single-discipline cycles. Instead, teacher collaboration networks should be built through cross-disciplinary teaching and research groups, interdisciplinary courses, and joint projects, so that artistic aesthetics, engineering technology, and vocational pedagogy form new combinations of capabilities.

3. Quality-Enhancement Pathways Guided by Art-Engineering Integration

3.1. Integrating Certification-Education-Position to Establish a Tiered Competency Framework

Using higher vocational job standards as the benchmark, individualized growth portfolios should be established for transferred teachers, incorporating higher-education teaching qualifications, academic upgrading, professional skills, and job competence into a unified development framework. Teachers with qualification gaps should receive intensive coaching and mock-lecture training; key teachers with strong technical skills should be provided with development pathways such as course leadership and practical-training mentorship; and younger teachers should strengthen their academic qualifications and research foundations. In the case examined, 101 full-time teachers were transferred, 97 of whom were recognized as dual-qualified teachers, accounting for 96%, while 79 obtained higher-education teaching certificates. These figures indicate that tiered

advancement can better balance standardized transformation and workforce stability than a single-minded focus on credential acquisition.

3.2. Jointly Advancing Art-Engineering-Teaching to Build Cross-Disciplinary Teacher Communities

Teacher development should be organized around professional clusters rather than individual courses, with teaching and research units jointly involving teachers of art and design, digital media, and intelligent manufacturing. Through mentorship by master teachers, open-class seminars, project-based instructional design, and interdisciplinary curriculum development, engineering and technical problems can be transformed into design tasks, while artistic creativity can be translated into manufacturable solutions. On this basis, courses such as Intelligent Cultural and Creative Product Design and Application of Intelligent Craft Manufacturing Technologies have been developed, shifting cross-boundary collaboration from event-based exchanges to a stable curriculum-development mechanism. At present, more than 95% of the teaching workload in the School of Intelligent Manufacturing is undertaken by teachers transferred from the former technical school, indicating that these teachers have gradually moved from being “subjects of integration” to becoming principal actors in professional development.

3.3. Linking Curriculum-Research-Industry to Form a Value-Added Chain Driven by Authentic Projects

Efforts to strengthen research competence should not be separated from teachers’ technical expertise and rebuilt from scratch; instead, teams should be organized around real problems faced by enterprises. Research leaders, engineering and technical teachers, and art and design teachers can form joint teams to transform projects involving technological upgrading, process optimization, and intelligent cultural-creative development into research topics, patents, curriculum cases, and practical-training tasks. Research on enterprise-based teacher practice shows that outcomes depend not only on duration but also on the depth of participation and the transformation of results [5-6]. Following implementation in the case institution, 5 provincial-level research projects and 24 municipal- or institution-level projects were approved; 43 papers were published; 12 textbooks were edited or co-edited; and 34 patents and software copyrights were granted. These outcomes demonstrate the conversion value of a chain from “industry problems” to “teaching and research outcomes” to “classroom resources.”

3.4. Coupling Competition-Training-Evaluation to Turn Competitions into Arenas for Competency Enhancement

Teachers’ teaching-ability competitions, students’ skills competitions, and routine professional development should be interconnected so that competitions do not become temporary tasks for only a small number of participants. Teachers can

design instructional projects around authentic production tasks, iteratively refine teaching plans while preparing for competitions, and then feed mature outcomes back into classroom teaching and student training, forming a cycle of “teacher practice–student application–classroom validation.” After consolidation, the comprehensive teaching assessment score of the relevant school increased by 15.6 points compared with the initial stage, the excellent rate in student evaluations of teaching rose from 68% to 94.2%, and students won 8 provincial awards in skills and innovation-and-entrepreneurship competitions over the past two years. These results suggest that evaluation indicators can genuinely drive teacher development only when they are connected with classroom quality and student growth.

3.5. Coordinating Master Teachers–Teams–Mechanisms to Create an Organizational Ecology for Sustained Growth

The development of dual-qualified teachers requires organizational support rather than isolated individual effort. Relying on master-teacher studios, master-craftsman studios, and teaching innovation teams, institutions can establish development tiers for promising young teachers, key teachers, and industry-recognized master teachers, while incorporating cross-disciplinary teaching, enterprise services, teaching and research outcomes, and student-development effectiveness into performance evaluation. At the same time, the authenticity and technical depth of enterprise practice should be strengthened, enabling teachers to move beyond observational visits and shadowing placements toward R&D projects, process improvement, and technical services. A national survey likewise shows that the continuity of enterprise practice, depth of involvement, and transformation of outcomes directly affect teachers’ sense of gain and professional growth [7]. In the case institution, teachers spend more than 70 days per year on average in enterprise practice, have undertaken 14 enterprise projects involving technological upgrading and process optimization, and have delivered 38 enterprise training sessions covering more than 1,800 participants. These results indicate that using team platforms to carry projects and evaluation mechanisms to recognize contributions helps transform individual experience into long-term institutional capability.

4. Conclusion

In summary, after a technical school is incorporated as a whole into a higher vocational college, the development of a dual-qualified teaching workforce should not regard qualification compliance as the endpoint. Instead, the teacher-development system should be reshaped around educational standards, professional integration, and industry needs. The practice of art-engineering integration shows that qualification standardization addresses the basic question of whether teachers can enter higher vocational teaching; cross-boundary joint research, project transformation, and enterprise practice address the core question

of whether they can deliver high-quality vocational education; and diversified evaluation together with team-based platforms determines whether such competence can continue to grow. In the future, institutions should further deepen teachers' participation in enterprises' core R&D activities and improve mechanisms for cultivating interdisciplinary courses and high-level teaching and research outcomes, so that institutional consolidation can genuinely generate synergistic gains in teacher development, talent cultivation, and services for regional industries.

Author Biography

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