

Research on School-Enterprise Collaborative Talent Training Mode Oriented to Secondary and Higher Vocational Education Articulation

Shan Yang, Yanhua Sun*

Shandong Labor Vocational and Technical College, Jinan 250000, Shandong, China

**Author to whom correspondence should be addressed.*

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: The articulation between secondary and higher vocational education is a key link in building a modern vocational education system and smoothing the growth path for technical and skilled talents. It breaks the “dead-end” limitation of secondary vocational education, provides students with a continuous path for academic advancement and career development, and effectively meets the urgent demand for high-level applied talents driven by industrial upgrading. The article focuses on the integration of industry and education, addressing practical issues in the cultivation of computer application technology professionals under the context of secondary and higher vocational education linkage. These issues include insufficient alignment in talent training objectives, inadequate coordination in curriculum design, and unclear connections to enterprise technical positions. With the goal of enhancing talent training quality and job adaptability, it systematically explores a talent cultivation model characterized by “integrated design, phased implementation, and progressive competency development.” Aiming at improving the quality of talent cultivation and students’ post-adaptability, it systematically explores a talent training mode featuring integrated design, phased implementation, and progressive competence development. Based on the growth law of professional literacy and the technical competency requirements of professional posts, this study proposes a restructuring scheme for the modular curriculum system and a school-enterprise collaborative education model for secondary and higher vocational education articulation. It also constructs a diversified and multi-dimensional education evaluation system, forming a closed-loop teaching mechanism integrating objectives, curricula, education and evaluation.

Keywords: Secondary and higher vocational education articulation; School-enterprise collaboration; Talent training mode

Online publication: August 13, 2026

1. Current situation of talent training in secondary and higher vocational education articulation

As China accelerates industrial upgrading and economic structural adjustment, the social demand for high-quality technical and skilled talents has become increasingly urgent ^[1]. As a key link in constructing the

modern vocational education system^[2], the articulation between secondary and higher vocational education has achieved remarkable progress in recent years, yet it also faces in-depth challenges in the transformation from quantity expansion to quality improvement. Overall, the current situation can be summarized as follows: the policy system is increasingly improved, and the articulation pathways have been basically opened up, while the curriculum system, training standards, and quality assurance mechanisms are still being optimized through continuous exploration.

Policy dividends have been unleashed, and articulation models have become diversified. In recent years, the state has issued a series of intensive policies, advancing the articulation of secondary and higher vocational education from theoretical concepts into practical implementation. The newly revised Vocational Education Law and other regulatory documents have clearly stipulated the need to improve a modern vocational education system featuring vertical connectivity and horizontal integration^[3]. Guided by these policies, a variety of mainstream articulation models have taken shape across the country. First, the 3+2 segmented program (secondary vocational plus higher vocational) is currently the most mainstream model. Students spend three years studying in secondary vocational schools, and upon passing the progression assessment, they enter the corresponding higher vocational colleges for another two years to obtain a junior college diploma^[4]. Second is the five-year integrated program. Led by higher vocational colleges, this program recruits junior high school graduates, adopts a five-year continuous training mechanism, and implements integrated curriculum design^[5]. Third are targeted independent enrollment and the vocational education college entrance examination. Under this model, graduates from secondary vocational schools can be admitted to higher vocational colleges or undergraduate universities through the vocational education college entrance examination, which evaluates both cultural literacy and vocational skills. It has become an increasingly important upward development pathway^[6,7].

Inadequate articulation remains in practical implementation. Although the enrollment pathways have been opened up, the problem of formal connection with fragmented content is still prominent in the actual talent training process. For example, many “3+2” programs actually implement independent curriculum plans for secondary and higher vocational education. Secondary vocational schools focus on basic skills, while higher vocational colleges emphasize advanced technical competencies. The two stages lack systematic logical progression. Consequently, the repetition rate of some professional course content between secondary and higher vocational education reaches as high as 30%–40%. On the contrary, some key knowledge points are missing, leaving higher vocational teachers with no choice but to supplement the curriculum that should have been completed at the secondary vocational stage, resulting in a waste of educational resources^[7].

Future development will move toward an intensive integrated model. The current reform focuses on constructing an integrated talent training program. Successful articulation between secondary and higher vocational education is no longer a simple addition of “secondary vocational plus higher vocational equals the 3+2 model”, but the in-depth integration of educational elements at the two stages. First lies in curriculum integration. Based on the analysis of typical work tasks, knowledge and skill points are restructured to avoid content repetition and realize the spiral improvement of professional competencies. Second is examination integration. It is necessary to strengthen the weight of the provincial unified vocational education college entrance examination, combine formative assessment with summative evaluation, and eliminate the “admission-by-default” progression mechanism. Third is management integration. Vocational education groups and high-level higher vocational colleges are encouraged to take the lead in establishing industry-education consortia covering both secondary and higher vocational education, so as to realize cross-level

sharing of teachers, curricula and training bases ^[8].

As an important measure to boost the high-quality development of modern vocational education, talent training through secondary and higher vocational education articulation has been widely promoted nationwide. Diversified articulation models have gradually taken shape, playing a positive role in cultivating high-quality technical and skilled talents and serving industrial development. Vocational colleges across the country have made extensive explorations in specialty construction, curriculum system design and talent training modes. Some majors have realized preliminary articulation between secondary and higher vocational stages, building pathways for students to upgrade professional skills and academic qualifications and supporting their career development. Nevertheless, viewed from the overall implementation effect, there still exist many urgent problems in articulated talent training, and a mature and sound integrated talent cultivation system has not yet been formed.

2. Problems existing in the articulation of secondary and higher vocational education

2.1. Insufficient articulation in the orientation and objectives of talent training

There remain prominent deficiencies in the articulation of talent training orientation and objectives, which are specifically manifested as deep-seated problems such as vague goal positioning, ambiguous hierarchical boundaries, and broken articulation logic. When formulating respective professional talent training programs, secondary and higher vocational colleges generally lack integrated overall planning. The secondary vocational stage mostly focuses on cultivating operationally skilled talents, emphasizing job proficiency and basic operational norms, while the higher vocational stage generally aims to foster high-skilled managerial or technical talents, attaching importance to comprehensive application capabilities and on-site problem-solving abilities. Theoretically, such goal positioning should form a progressive hierarchical relationship of competency advancement. In practice, however, it is often divided into two independent closed training loops. Secondary vocational schools fail to clarify the competency starting requirements of higher vocational education, and higher vocational colleges lack understanding of the competency foundation cultivated at the secondary vocational stage, resulting in the absence of precise docking interfaces between training objectives ^[9]. In addition, some higher vocational colleges simply elevate the training objectives of secondary vocational education superficially. They merely increase curriculum difficulty or expand knowledge capacity instead of realizing substantive upgrading of competency levels in accordance with the law of career development — such as evolving from completing simple tasks to optimizing complex systems. This misalignment easily leads students to face the dilemma of competency disconnection or stagnant ability development after further education.

2.2. Uncoordinated curriculum setup and mismatched teaching content

In the practice of curriculum design and teaching content delivery for the articulation between secondary and higher vocational education, the problem manifests itself in two aspects. On the one hand, the curriculum structure of the two stages adopts a fragmented and isolated design. Secondary vocational schools generally organize courses under the traditional framework of general basic courses + professional basic courses + skill training courses, focusing on the teaching of basic concepts, simple operations and standardized procedures. By contrast, higher vocational colleges tend to construct their curriculum in the mode of platform courses

+ specialized elective courses + comprehensive practical training, laying emphasis on the in-depth study of systematic knowledge, understanding of technical principles and handling of complex tasks. The two stages lack unified vocational competency standards as a benchmark, and no regular consultation mechanism for curriculum docking has been established. On the other hand, the matching degree of teaching content is insufficient. Teaching content at the secondary vocational stage focuses on single-skill training and the cultivation of basic post norms, while higher vocational teaching involves technical principle analysis, process optimization and fault handling. The two types of teaching content should logically form a progressive progression from experience to strategy and from concreteness to abstraction. In reality, however, due to the lack of hierarchical differentiation in curriculum standards, the practical experience accumulated in secondary vocational education cannot be effectively upgraded into strategic application capabilities required in higher vocational education ^[10,11].

2.3. Ambiguous docking with enterprise technologies and professional posts

Secondary and higher vocational schools lack a unified definition of job competency levels based on real enterprise demands. For the same technical position, the competency requirement at the secondary vocational stage is defined as being able to complete basic module coding in accordance with specifications, while that at the higher vocational stage is stipulated as being capable of participating in advanced coding and system design. Nevertheless, due to the lack of quantifiable competency grading standards from frontline enterprises as the basis for educational articulation, the teaching objectives and skill training arrangements at both stages are often inconsistent with enterprise job requirements. This results in problems such as excessively steep learning progression or overly long competency plateau in students' professional growth. In addition, the mechanism for enterprises to participate in articulated talent training is imperfect and has become a common problem. Under the framework of secondary and higher vocational education articulation, enterprises are usually only involved in on-the-job internship and graduation design links, and fail to deeply participate in the formulation of integrated talent training programs, curriculum development and the demonstration of competency standards for secondary-higher vocational integration ^[12].

3. Talent training model of computer application technology major based on industry-education integration

3.1. Integrated talent training objectives and training specifications

Focusing on the middle and downstream sectors of the regional digital economy, software and information technology service industry, this study benchmarks typical positions such as programming and Web front-end development. Through on-site post follow-up investigations, typical work tasks are identified. Based on real scenarios and practical problems in project development and technical service management, occupational competencies for relevant posts are analyzed. Centering on the major of Computer Application Technology, it establishes a coherent training objective for secondary and higher vocational education: cultivating high-quality technical and skilled talents who understand development, master programming, excel in operation and maintenance, and are good at innovation. Meanwhile, by integrating the professional knowledge, technical skills and comprehensive literacy required by job positions, it sorts out the standardized training specifications for talent cultivation. The goal is to foster interdisciplinary technical and skilled talents with coordinated development of computer theoretical foundation, engineering practical ability and professional literacy ^[13].

3.2. Modular curriculum system for secondary and higher vocational education articulation

Based on industrial demands and following the construction principle of three-dimensional connectivity and hierarchical progression, this study focuses on the coordinated improvement of professional competence, comprehensive ability and expansive ability. It constructs a four-dimensional integrated modular professional curriculum system for secondary and higher vocational education articulation, with ideological and political education infiltrating the whole teaching process. The system realizes seamless connection between secondary and higher vocational education, as well as the two-way integration of professional resources and personalized talent training ^[14].

The core of the system takes job competency requirements as the logical starting point, modular professional courses as the carrier of talent cultivation, vocational skills competitions at all levels as the platform for competency training, and vocational skill level certificates as the industry certification outlet. It realizes in-depth integration and two-way empowerment of the four elements, forming a comprehensive curriculum system in which jobs guide the orientation, courses lay the foundation, competitions polish competencies, and certificates enhance training quality. Meanwhile, aiming at high-level comprehensive development and personalized ability cultivation, on the basis of solid professional theories and core skills, an extended curriculum platform for professional clusters is set up across different specialty directions for interdisciplinary elective study. It optimizes interdisciplinary curriculum resources and enterprise comprehensive practice platforms, breaks down professional barriers, expands channels for innovation and entrepreneurship, and helps students develop advanced professional competencies.

3.3. School-enterprise collaborative talent training model for secondary and higher vocational education articulation

Adhering to the training principle of “dual subjects, dual identities, dual tutors and dual venues”, a new talent training program for secondary and higher vocational education is constructed under the philosophy of “determining education by industry, promoting education through industry, integrating work with study, and unifying knowledge and practice”^[15]. Under the dual leading operation of schools and enterprises, the dual tutor system is implemented to formulate talent training programs and dynamically adjust teaching content jointly. It adopts an education model integrating the four chains: curriculum chain, project chain, certificate chain and employment chain. A hierarchical and modular curriculum system oriented by post competency is established. Taking the four chains as the starting point, a three-stage progressive training mode of “solidifying foundation, upgrading competence and cultivating elites for targeted employment” is carried out. Focusing on the educational philosophy of integrating knowledge, practice and innovation, a new development pattern is achieved that promotes the coordinated progress of five dimensions: specialty construction level, talent cultivation quality, enterprise employment satisfaction, resource integration efficiency, and teachers’ dual-qualified professionalism.

3.4. Education evaluation system for secondary and higher vocational education articulation

Construct a talent cultivation evaluation system with diverse participants and multi-dimensional dimensions, breaking through the limitations of traditional single evaluation and abandoning the closed model in which students were previously assessed solely by schools.

By introducing multiple evaluation participants, including secondary vocational teachers, higher vocational teachers, enterprise tutors, competition judges, as well as student self-evaluation and peer evaluation, a three-dimensional evaluation network is established. A unified vocational competency growth portfolio is adopted for the two educational stages to realize the coherent transmission, accumulation and mutual recognition of evaluation data. The evaluation dimensions focus on multi-indicator criteria including professional literacy, vocational skills, methodological competence and social competence. It assesses students' understanding and mastery of basic cultural knowledge and professional theories, and places greater emphasis on examining their progressive development in the complexity, comprehensiveness and innovation of technical skills. Meanwhile, core literacies such as professionalism, craftsmanship spirit, teamwork awareness and labor spirit are taken as key evaluation indicators, ensuring that the evaluation system remains aligned with the comprehensive talent training requirements of the post-course-competition-certificate integration model. In terms of evaluation methods, emphasis is placed on articulation-oriented design. The secondary vocational stage focuses on process evaluation and qualitative feedback, helping students build professional self-confidence and basic professional norms. By contrast, the higher vocational stage gradually increases summative evaluation and quantitative criteria, aligning with industry certification requirements and post-competency standards.

4. Conclusion

The optimization of the talent training model for secondary and higher vocational education articulation is an important measure to promote the high-quality development of modern vocational education. Its core lies in breaking the teaching barriers within the traditional vocational education system and realizing the coherence and adaptability of talent cultivation^[16]. Based on an analysis of the existing problems in the training of Computer Application Technology majors in secondary and higher vocational education, this paper proposes a reform scheme for the talent training model, which takes integrated design as the main line, ability progression as the core, and diversified evaluation as the guarantee. The model proposed in this study still needs adjustment and optimization according to specific practical situations in the implementation process. In the future, with the in-depth advancement of the digital transformation of vocational education, how to realize the whole-process dynamic monitoring and personalized training of secondary-higher vocational articulation by means of artificial intelligence, big data and other technologies will become a research direction worthy of in-depth and continuous exploration.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Liu X, Li J, Liu C, 2025, Constructing Integrated Teaching Innovation Teams for Secondary and Higher Vocational Education in the Digital Economy: A Theoretical Framework and Implementation Strategies. *Occupation and Professional Education*, 2(9): 2599.
- [2] Guo ZZ, 2023, The Research on the Mechanism of Integrated Development of Secondary Vocational Education and Higher Vocational Education. *The Journal of Education Insights*, 1(2): 6.

- [3] Zhang Y, 2025, Coordination and Alignment: On the Relationship between the Newly Revised Vocational Education Law and the Opinions on Deepening the Reform of the Modern Vocational Education System Construction. *International Education Forum*, 3(11): 49–56.
- [4] Li C, 2026, Research on the Integration Path and Practice of the “3+2” Sectional Curriculum System for Secondary and Higher Vocational Education Articulation. *Automobile Maintenance and Maintenance*, (04): 98–100.
- [5] Jianhua J, 2024, Exploration of Entrepreneurship Education Model and Practice in Five-Year Integrated Vocational Education Stage. *Education Reform and Development*, 6(10): 227–233.
- [6] Jinzhi Z, 2017, The Measures of Vocational Education Reform in Shandong to Boost the College Entrance Examination in Spring. *Proceedings of the 2017 6th International Conference on Social Science, Education and Humanities Research (SSEHR 2017)*: 574–578.
- [7] Liu H, Wang K, 2025, The Reform Practices, Challenges, and Promotion Strategies of the College Entrance Examination for Vocational Education: A Case Study of Shandong Province. *China Examinations*, (06): 81–89.
- [8] Wang J, 2013, The Research of Problems and Countermeasures in the Connection Between Secondary and Higher Vocational Education. *Proceedings of the International Conference on Educational Technology and Information System (ICETIS 2013)*.
- [9] Zhang X, Yu T, 2022, Analysis and Construction of the Course System Cohesion of Computer Network Technology Specialty in Secondary and Higher Vocational Education. *Journal of Qiqihar Normal Junior College*, (02): 118–120.
- [10] Xie X, Lang P, Zeng F, 2025, Problems and Countermeasures of Secondary and Higher Vocational Education Articulation in Vocational Education. *Life Education*, (06): 98–101.
- [11] Wei G, 2025, Problems and Countermeasures of Talent Training Mode in Secondary and Higher Vocational Education Articulation. *Science Consultation*, (03): 277–280.
- [12] Bai X, Fu L, 2025, Research on Progressive Curriculum System of Secondary and Higher Vocational Articulation for Computer Application Major. *Journal of Jiamusi Vocational Institute*, 41(01): 190–192.
- [13] Chen Z, 2025, Research on Teaching Reform of Basic Computer Application Course in Higher Vocational Colleges under Multi-dimensional Training Objectives. *Computer Knowledge and Technology*, 21(34): 147–149 + 152.
- [14] Yang Q, 2026, Research on the Integrated Talent Training Model of “Post-Course-Competition-Certificate” for Higher Vocational Computer Application Major. *China New Communication*, 28(03): 104–106.
- [15] Weiwei L, 2019, Research on the Path of Integration of Production and Education in Higher Vocational Education in China. *Proceedings of the 2019 Asia-Pacific Conference on Advances in Education, Learning and Teaching (ACAELT 2019)*: 1048–1053.
- [16] Mao J, 2025, Research on the Practical Talent Training Model of Secondary and Higher Vocational Education Articulation under the Background of the New Vocational Education Law. *Journal of Liaoning Economic Vocational and Technical College & Liaoning Economic Management Cadre College*, (04): 179–181.

Publisher’s note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.