# Research on the Current Layout of Professional Master's Degree Programs in Vocational and Technical Education in China

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## Abstract

With the high-quality development of vocational education in China being elevated to a national strategy, professional master's degree programs in vocational and technical education, as the core carrier for cultivating "dual-qualified" teachers and technical and skilled talents, have seen the optimization of their layout become a key lever for implementing strategies such as "building a strong manufacturing nation" and "rural revitalization." However, despite unprecedented policy promotion efforts, vocational education resources still face structural contradictions, including regional imbalance, ambiguous positioning of institutions, and homogenization of research directions. These issues urgently require systematic research to resolve. This study aims to analyze the current regional, institutional, and directional layout of professional master's degree programs in vocational and technical education in China, reveal core problems, and provide empirical evidence for optimizing resource allocation and enhancing the efficiency of industry-education integration. By employing literature analysis and data statistical analysis methods, this study focuses on the distribution of degree programs, enrollment scales, and research directions of 39 full-time enrollment institutions. Combining policy texts and regional economic data, it systematically sorts out the layout characteristics and contradictions. The research findings indicate that the layout of professional master's degree programs in vocational and technical education suffers from regional distribution imbalance, with a pattern of "strong in the

east and weak in the west"; ambiguous institutional types and positioning, resulting in insufficient adaptability of the training system; severe homogenization of research directions and lagging development in emerging fields; as well as irrational primary distribution, with provincial capitals' concentration leading to a scarcity of local resources. Based on the core problems identified, the study proposes promoting cross-regional collaboration to break the "strong in the east and weak in the west" pattern; clarifying the classification and positioning of institutions to optimize the adaptability of the training system; supporting emerging fields and guiding the specialization of research directions; and strengthening local resource supply to alleviate the contradiction of provincial capital concentration. In the future, with "demand orientation" and "characteristic development" as the core, a layout of professional master's degree programs in vocational and technical education that covers the entire region and achieves deep industry-education integration should be constructed to support the high-quality development of national strategies and regional economies.

**Keywords:** vocational and technical education; professional master's degree; layout of degree programs; current situation research

## Introduction

In recent years, China has achieved remarkable accomplishments in the development of professional degree graduate education. Not only has the enrollment and cultivation scale grown steadily, but a cultivation model with Chinese characteristics has also taken shape, providing solid support for the cultivation of high-level application-oriented and innovative talents. In 2020, the *Development Plan for Professional Degree Graduate Education (2020 - 2025)* stipulated that the enrollment scale of master's professional degree graduate students should be expanded to about two-thirds of the total enrollment scale of master's graduate students, and the enrollment of doctoral professional degree graduate students should be significantly increased *(Bulletin of the Ministry of Education of the People's Republic of China, 2020*). In 2023, the Ministry of Education issued the Opinions on Further Promoting the Classified Development of Academic Degree and Professional Degree Graduate Education, emphasizing the in-depth promotion of the classified development of academic degree and professional degree graduate education to build a high-quality graduate education system. As of 2023, the proportion of professional degree graduate enrollment in China has approached 60%, and research on professional master's degrees has entered a new stage (Bulletin of the Ministry of Education of the People's Republic of China, 2024).

The professional master's degree in vocational and technical education is a professional degree established in China to meet the needs of the modern vocational education system. It aims to cultivate "dual-qualified" high-level vocational education teachers and leading technical and skilled talents in the industry. Its core positioning is "excellence in both theory and practice," emphasizing the deep integration of educational and teaching theories, professional technical capabilities, and industry-education integration capabilities, serving the needs of faculty team construction in vocational colleges and industrial transformation and upgrading (Xie Yongqi, 2024).

This study focuses on the secondary discipline of vocational and technical education (code: 045120) under the first-level discipline of pedagogy. Given the limited number

of non-full-time vocational and technical education degree programs and their relatively small enrollment scales, this study does not include them in the scope of investigation. Instead, it only examines full-time vocational and technical education degree programs. Moreover, since there is no verifiable information on professional master's degrees in vocational education in Hong Kong, Macao, and Taiwan, these regions are excluded from the study. By employing literature analysis and data statistical analysis methods, this study aims to explore the current layout of professional master's degree programs in vocational and technical education in China, identify core problems, and provide optimization suggestions.

## 1. Research Background

### (I) Policy Orientation of Vocational and Technical Education in China

In recent years, the state has attached great importance to the high-quality development of vocational and technical education, incorporating it into national strategic planning and issuing a series of policies to promote the construction of the professional master's degree cultivation system. The National Plan for Implementing Vocational Education Reform ("20 Measures for Vocational Education") issued by the State Council clearly proposes to "improve the high-level application-oriented talent cultivation system," requiring the expansion of the enrollment scale of master's degrees in vocational and technical education and strengthening the orientation of industry-education integration (Ren Yiping, 2024). The Development Plan for Professional Degree Graduate Education in Vocational Education issued by the Ministry of Education further refines the cultivation standards, emphasizing the construction of a "theory + practice" dual-track curriculum system with "dual-qualified" faculty as the core, and stipulating that the proportion of practical credits should be no less than 30% (Huo Junjiao, 2023). The newly revised Vocational Education Law of the People's Republic of China in 2022 further strengthens legal safeguards, stipulating that local governments should incorporate vocational education into economic and social development plans and establish a

long-term mechanism for funding vocational education. Therefore, the cultivation of professional master's degree students in vocational and technical education must closely align with national policies, combine with local economic and social development needs, optimize professional settings, and ensure a high degree of 契合 (fit, here referring to the alignment between talent cultivation and social needs) between talent cultivation and social demands (Ping Heguang, Liu Jiao & Guo Dan, 2022).

**(II) Existing Problems in Vocational and Technical Education in China**

Despite unprecedented policy support, the cultivation of professional master's degrees in vocational and technical education in China still faces multiple challenges. The issue of regional layout imbalance is prominent, with the eastern region concentrating 51.28% of the degree programs and nearly 60% of the enrollment scale, while 12 provinces in the central and western regions (such as Anhui and Qinghai) have no degree programs at all, resulting in a pattern of "eastern siphoning - central and western collapse" in vocational education resources. The phenomenon of disconnection between industry and education is widespread. The course content in some institutions lags behind industrial technological upgrades, and enterprises lack the motivation to participate, with the proportion of practical teaching being less than 30%. Homogenized competition is severe, with hot directions such as tourism services and finance and commerce accounting for over 40% of the enrollment, while characteristic fields such as digital media design and modern agriculture are marginalized due to a lack of policy guidance. Current hot topics focus on exploring the path of "integration of vocational and general education," the digital transformation of vocational education, the construction of a skilled society, and the innovation of the cultivation mechanism for "dual-qualified" faculty. There is relatively little research on professional master's degrees in vocational and technical education, so it is urgent to break through the structural contradictions in the layout of professional master's degrees in vocational and technical education through systematic research and reform (Chen Limin & Lin Peijie, 2025).

(III) Practical Significance of Vocational and Technical Education in China

The cultivation of professional master's degrees in vocational and technical education has dual values for national strategies and social development. For the country, it is a key lever for implementing strategies such as "building a strong manufacturing nation" and "skilled China." By delivering high-end technical and skilled talents, it helps upgrade industrial chains and tackle core technologies. At the same time, relying on policies such as "rural revitalization" and "east-west cooperation," it cultivates talents in fields related to agriculture, culture and tourism, etc., in a targeted manner to promote coordinated regional development (Cao Ye & Li Xinfa, 2018). For society, it promotes an overall leap in the quality of vocational education by enhancing the professionalization level of vocational education faculty (such as the proportion of "dual-qualified" teachers exceeding 60%), alleviating "structural employment contradictions" (Zhang Jianrong, 2019). In addition, the interdisciplinary talents cultivated under the industry-education integration model can effectively fill the talent gaps in emerging industries such as artificial intelligence and the industrial Internet, driving social innovation momentum (He Zhen & Zhang Yu, 2010). Overall, professional master's degrees in vocational and technical education are not only an important breakthrough in the reform of the education system but also an important support for achieving high-quality economic development and social equity.

## II. Institutional Characteristics and Enrollment Scale of Professional Master's Programs in Vocational and Technical Education in China

### (I) Analysis of Enrollment Institutions and Colleges

A total of 39 higher education institutions in China participate in the enrollment of professional master's programs in vocational and technical education, spanning 23 provincial administrative regions. The number of colleges under each institution ranges from 1 to 7, covering multiple fields such as engineering technology, educational science, economic management, and art design. For example, Tianjin University of Technology and Education has seven colleges, including the School of Mechanical Engineering, School of Electronic Engineering, and School of

Automation and Electrical Engineering; Guangdong Polytechnic Normal University comprises six colleges, such as the College of Mechanical and Electrical Engineering, College of Finance and Economics, and College of Management; Nanning Normal University has established characteristic colleges like the College of Logistics Management and Engineering, College of Fine Arts and Design, and College of Vocational and Technical Teacher Education. Through diversified college settings, institutions have constructed a complete vocational education system that covers technical practice, faculty cultivation, and industry management. The enrollment colleges for professional master's programs in vocational and technical education can be classified into the following four major types (see Table 1).

First, engineering and technology colleges. These colleges account for the highest proportion and take the cultivation of technical talents in fields such as machinery, electronics, and information technology as their core objective. Typical colleges include those in the mechanical category: School of Mechanical Engineering (Tianjin University of Technology and Education, Hunan University of Science and Technology), School of Intelligent Manufacturing (Jiangxi Science and Technology Normal University); in the electronics and information category: School of Electronic Engineering (Tianjin University of Technology and Education), School of Information Technology Engineering (Tianjin University of Technology and Education), School of Computer Science and Technology (Changchun Normal University); in the transportation and automation category: School of Automobile and Traffic Engineering (Guangdong Polytechnic Normal University), School of Automation and Electrical Engineering (Tianjin University of Technology and Education).

Second, educational science colleges. These colleges focus on the cultivation of vocational education faculty. Representative colleges include the College of Vocational and Technical Teacher Education (Guangxi Normal University, Nanning Normal University), College of Educational Science (Nanjing Normal University, South China Normal University), and College of Vocational and Technical Teacher Education (Shanghai Second Polytechnic University). These colleges emphasize the

dual training of pedagogical theories and teaching skills to supply professional teachers for the vocational education system.

Third, art and design colleges. These colleges combine cultural creativity with vocational skills and have established colleges such as the College of Art (Tianjin University of Technology and Education), College of Music and Dance (Nanning Normal University), and College of Fine Arts and Design (Nanning Normal University) to cultivate application-oriented talents in fields like art design and cultural communication.

Fourth, other characteristic colleges. Some institutions have established characteristic colleges with differentiated positioning: Yanpei College (Jiangsu University of Technology): Named after Huang Yanpei, a pioneer in vocational education, it focuses on industry-education integration and technological innovation; International Tourism and Culture College (Guizhou Normal University): Integrates tourism management and cultural resources to serve the regional cultural and tourism industry; College of Culture, Tourism, and Film (Changchun Normal University): Integrates culture, tourism, and film technology to expand the cross-boundary capabilities of vocational education.

Overall, the college settings of vocational and technical education institutions are closely centered around industrial demands and social development. Engineering and technology colleges take machinery, electronics, and information technology as their core, directly aligning with the upgrading of the manufacturing industry and the digital trend. Economic and management colleges strengthen industry management capabilities to support the coordinated development of industrial chains. Educational science colleges ensure the professionalization and standardization of vocational education faculty. Art and design colleges enrich the diversity of vocational education through cultural creativity. Characteristic colleges further deepen the integration of vocational education with local economic and cultural resources through differentiated positioning, such as the historical heritage of Yanpei College and the regional economic adaptability of the College of Logistics Management and Engineering. This classification system not only reflects the technology-oriented

nature of vocational education but also meets the society's broad demand for interdisciplinary skilled talents through a diversified layout, constructing a complete vocational education ecosystem that covers technical practice, faculty cultivation, and industry management.

Table 1: Information on Enrollment Institutions and Colleges

| Serial No. | Province | University | College(s) |
|---|---|---|---|
| 1 | Beijing | Beijing Union University | College of Applied Science and Technology |
| 2 | Tianjin | Tianjin University | School of Education |
| 3 | Tianjin | Tianjin University of Technology and Education | School of Mechanical Engineering |
| | | | School of Electronic Engineering |
| | | | School of Automation and Electrical Engineering |
| | | | School of Information Technology Engineering |
| | | | School of Automobile and Traffic Engineering |
| | | | School of Economics and Management |
| | | | College of Art |
| 4 | Hebei | Hebei Normal University | Vocational and Technical College |
| 5 | Hebei | Hebei Normal University of Science and Technology | Institute of Vocational Education Research |
| 6 | Shanghai | Shanghai Second Polytechnic University | College of Vocational and Technical Teacher Education |
| 7 | Jiangsu | Nanjing Normal University | College of Educational Science |
| 8 | Jiangsu | Jiangsu Normal University | College of Educational Science |
| 9 | Jiangsu | Jiangsu University of Technology | Yanpei College |
| 10 | Zhejiang | Zhejiang University of Technology | College of Vocational and Technical Education |
| 11 | Zhejiang | Zhejiang Normal University | School of Economics and Management |
| | | | College of Engineering |
| 12 | Shandong | Ocean University of China | Basic Teaching Center |
| 13 | Shandong | Shandong Normal University | College of Geography and Environment |
| | | | College of Information Science and Engineering |
| | | | Business School |
| 14 | Shandong | Qufu Normal University | School of Law |
| | | | College of Geography and Tourism |
| 15 | Guangdong | South China Normal University | College of Educational Science |

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|---|---|---|---|
| | | | School of Tourism |
| 16 | Guangdong | Guangdong Polytechnic Normal University | College of Mechanical and Electrical Engineering |
| | | | College of Finance and Economics |
| | | | College of Management |
| | | | College of Electronic and Information Engineering |
| | | | School of Automobile and Traffic Engineering |
| 17 | Shanxi | Shanxi University | School of Continuing Education |
| 18 | Jiangxi | Jiangxi Science and Technology Normal University | College of Economics, Management, and Political Science and Law |
| | | | College of Tourism, History, and Culture |
| | | | College of Information Engineering |
| | | | School of Intelligent Manufacturing |
| 19 | Henan | Henan University | College of Culture and Tourism |
| 20 | Hubei | Hubei University of Technology | College of Vocational and Technical Teacher Education |
| 21 | Hunan | Hunan University of Science and Technology | College of Mechanical and Electrical Engineering |
| | | | College of Chemistry and Chemical Engineering |
| | | | College of Physics and Electronic Science |
| | | | College of Physics and Electronic Science |
| | | | Business School |
| | | | College of Materials Science and Engineering |
| 22 | Hunan | Hunan Normal University | School of Tourism |
| | | | College of Engineering and Design |
| 23 | Guangxi | Guangxi University of Science and Technology | College of Marxism |
| 24 | Guangxi | Guangxi Normal University | College of Vocational and Technical Teacher Education |
| 25 | Guangxi | Nanning Normal University | College of Logistics Management and Engineering |
| | | | College of Fine Arts and Design |
| | | | College of Music and Dance |
| | | | College of Vocational and Technical Teacher Education |
| 26 | Chongqing | Chongqing Normal University | College of Geography and Tourism |
| 27 | 27 | Sichuan | Sichuan University of Science & Engineering |
| 28 | Guizhou | Guizhou Normal University | College of Physics and Electronic Science |

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|---|---|---|---|
| | | | School of Economics and Management |
| | | | College of Materials and Architectural Engineering |
| | | | College of Mechanical and Electrical Engineering |
| | | | International Tourism and Culture College |
| 29 | Yunnan | Yunnan University | School of Education |
| 30 | 30 | Yunnan | Yunnan Normal University |
| 31 | 31 | Shaanxi | Shaanxi University of Science & Technology |
| 32 | 32 | Shaanxi | Shaanxi Normal University |
| 33 | Gansu | Northwest Normal University | College of Computer Science and Engineering |
| | | | College of Life Sciences |
| 34 | Gansu | Northwest Minzu University | College of Educational Science and Technology |
| 35 | 35 | Liaoning | Shenyang Normal University |
| 36 | 36 | Jilin | Jilin Agricultural University |
| 37 | Jilin | Jilin Engineering Normal University | School of Economics and Management |
| | | | College of Mechanical and Vehicle Engineering |
| | | | College of Electrical and Information Engineering |
| 38 | Jilin | Jilin International Studies University | International Business School |
| | | | School of English |
| | | | International Art College |
| 39 | Jilin | Changchun Normal University | School of Computer Science and Technology |
| | | | College of Engineering |
| | | | School of Economics and Management |
| | | | College of Culture, Tourism, and Film |

## (II) Analysis of Institution Types

1. Normal Universities Hold a Dominant Position

From the perspective of degree programs and enrollment numbers, the cultivation of professional master's degrees in vocational and technical education is highly concentrated in normal universities. Data shows that normal universities have established a total of 22 degree programs, accounting for 56.4% of the total; the

enrollment reaches 638 students, accounting for 65.64%. Both indicators far surpass those of other types of institutions. For example, Guangxi Normal University, Nanjing Normal University, and Shaanxi Normal University all conduct enrollment through their Colleges of Educational Science or Colleges of Vocational and Technical Teacher Education, highlighting the core role of normal universities in the cultivation of vocational education faculty. These institutions typically take pedagogy as the foundation and integrate practical courses in vocational and technical education to form a compound cultivation model of "theory + skills". In addition, the enrollment scale advantage of normal universities, with an average of approximately 29 students enrolled per degree program, further reflects their social recognition and resource concentration in the field of vocational and technical education.

2. Universities of Science and Technology and Comprehensive Universities Provide Supplementary Support, with Other Types Having a Minimal Share

Universities of science and technology and comprehensive universities play a secondary role in the cultivation of master's degrees in vocational and technical education. Universities of science and technology have set up 7 degree programs (accounting for 17.9%) and enrolled 168 students (accounting for 17.28%). Represented by Tianjin University of Technology and Education and Guangdong Polytechnic Normal University, their Schools of Mechanical Engineering, Schools of Electronic Engineering, etc., focus on the cultivation of skilled talents in the field of engineering technology. The enrollment scale basically matches the number of degree programs. Although comprehensive universities have slightly more degree programs than universities of science and technology (8, accounting for 20.5%), their enrollment is only 146 students (accounting for 15.02%). For instance, the Basic Teaching Center of Ocean University of China and the School of Education of Yunnan University have cultivation directions that are more inclined towards interdisciplinary studies, but their enrollment efficiency is relatively low. In comparison, agricultural universities (1 degree program with 5 students enrolled) and language universities (1 degree program with 15 students enrolled) have an extremely low share. They only offer programs sporadically in individual institutions (such as

the College of Humanities of Jilin Agricultural University and the International Business School of Jilin International Studies University), contributing limitedly to the overall cultivation system.

Overall, the cultivation of professional master's degrees in vocational and technical education presents a pattern of "normal universities taking the lead, universities of science and technology providing supplementary support, and comprehensive universities offering auxiliary assistance". Normal universities, with their advantages in educational disciplines, have become the core force, while universities of science and technology and comprehensive universities provide differentiated support in specific fields. Agricultural and language universities are in a marginal position (see Table 2).

Table 2: Information on Institution Types, Number of Degree Programs, and Enrollment Numbers

| **Institution Type** | **Number of Degree Programs** | **Proportion** | **Enrollment Numbers** | **Proportion** |
|---|---|---|---|---|
| Universities of Science and Technology | 7 | 17.9% | 168 | 17.28% |
| Agricultural Universities | 1 | 2.6% | 5 | 0.51% |
| Normal Universities | 22 | 56.4% | 638 | 65.64% |
| Language Universities | 1 | 2.6% | 15 | 1.54% |
| Comprehensive Universities | 8 | 20.5% | 146 | 15.02% |
| **Total** | **39** | **100.0%** | **972** | **100.00%** |

## (III) Analysis of Institution Levels

1. Local Key Institutions Occupy a Core Position

The cultivation resources for professional master's degrees in vocational and technical education are highly concentrated in local key institutions. Data shows that local key institutions have established a total of 21 degree programs, accounting for 53.8% of the total; the enrollment reaches 580 students, accounting for 59.67%. Both indicators

exceed half of the total. For example, local key institutions such as Tianjin University of Technology and Education and Guangdong Polytechnic Normal University offer multi-field degree programs through their Schools of Mechanical Engineering, Schools of Electronic and Information Engineering, etc. The enrollment scale of individual institutions is generally relatively high, with an average of about 28 students per institution, reflecting the resource concentration and cultivation capacity advantages of local key institutions in the field of vocational education. These institutions usually receive special support from local governments, and their discipline settings are closely aligned with regional industrial demands, such as automotive engineering, intelligent manufacturing, and other directions. This not only ensures the enrollment scale but also strengthens the employment adaptability of vocational education master's graduates.

2. Local Regular Institutions and "Double First-Class" Institutions Form Differentiated Supplements

Local regular institutions (9 degree programs, accounting for 23.1%; enrollment of 238 students, accounting for 24.49%) and "Double First-Class" institutions (9 degree programs, accounting for 23.1%; enrollment of 154 students, accounting for 15.84%) play auxiliary roles in the cultivation system. Local regular institutions, such as Nanning Normal University and Qufu Normal University, have the same number of degree programs as "Double First-Class" institutions but a larger enrollment scale (an average of 26 students enrolled per degree program). They mainly conduct small-scale enrollment through characteristic colleges such as the College of Logistics Management and the School of Tourism to serve specific segments of the local economy. "Double First-Class" institutions, on the other hand, exhibit the characteristic of "high number of degree programs but low enrollment". For instance, institutions like the Basic Teaching Center of Ocean University of China and the College of Computer Science and Engineering of Northwest Normal University, although offering degree programs 依托 (relying on) the platforms of prestigious universities, have low actual enrollment efficiency due to their academic focus being

more inclined towards academic research or non-vocational education fields (an average of about 17 students enrolled per degree program).

Overall, the cultivation of master's degrees in vocational and technical education presents a pattern of "local key institutions taking the lead, local regular institutions providing supplements, and 'Double First-Class' institutions offering auxiliary support". Local key institutions have become the main force in cultivation due to policy and resource 倾斜 (favoritism/support). Local regular institutions focus on regional characteristics, while "Double First-Class" institutions have limited participation in the vocational education field due to their disciplinary positioning. (see Table 3)

Table 3: Information on Institution Levels, Number of Degree Programs, and Enrollment Numbers

| **Institution Level** | **Number of Degree Programs** | **Proportion** | **Enrollment Numbers** | **Proportion** |
|---|---|---|---|---|
| Local Regular Institutions | 9 | 23.1% | 238 | 24.49% |
| Local Key Institutions | 21 | 53.8% | 580 | 59.67% |
| "Double First-Class" Institutions | 9 | 23.1% | 154 | 15.84% |
| **Total** | **39** | **100.0%** | **972** | **100.00%** |

### (IV) Analysis of Institution Positioning

1. Comprehensive Institutions Lead the Cultivation System, and Application-Oriented Institutions Support Practical Demands

The degree programs and enrollment scale for professional master's degrees in vocational and technical education are highly concentrated in comprehensive institutions. Data shows that comprehensive institutions have established a total of 19 degree programs, accounting for 48.7%; the enrollment reaches 522 students, accounting for 53.70%. Both indicators exceed half of the total. For example, comprehensive institutions such as the Faculty of Education of Shaanxi Normal University and the School of Educational Science of Jiangsu Normal University,

relying on their broad disciplinary coverage, integrate resources from multiple fields including pedagogy, engineering, and management to form an interdisciplinary cultivation model. These institutions, through their subordinate vocational and technical education colleges or related colleges, not only ensure the depth of theoretical research but also take into account the practicality of vocational skills, resulting in relatively high enrollment efficiency (an average of about 27 students enrolled per degree program). Application-oriented institutions rank second with 15 degree programs (accounting for 38.5%) and an enrollment scale of 355 students (accounting for 36.52%). For instance, the School of Mechanical Engineering of Tianjin University of Technology and Education and the College of Electromechanical Engineering of Guangdong Polytechnic Normal University focus on engineering fields such as mechanics, electronics, and information technology, emphasizing the integration of industry and education as well as skill training. Their enrollment scale is well-matched with the number of degree programs (an average of about 24 students enrolled per degree program).

2. Research-Oriented Institutions Have Limited Participation, with Significant Positioning Differences

Research-oriented institutions account for a relatively low proportion in the cultivation of vocational education master's degrees, with only 5 degree programs (accounting for 12.8%) and an enrollment of 95 students (accounting for 9.77%). For example, institutions like the Basic Teaching Center of Ocean University of China and the College of Computer Science and Engineering of Northwest Normal University, although offering degree programs 依托 (relying on) the platforms of prestigious universities, have their disciplinary focus more inclined towards academic research or non-vocational education fields. Their enrollment efficiency is significantly lower than that of other types of institutions, with an average of only 19 students enrolled per degree program. The limited participation of research-oriented institutions reflects the practice-oriented nature of vocational education, which differs from the traditional positioning of research-oriented institutions. In contrast, comprehensive and application-oriented institutions, through flexible integration of

resources, are better suited to the dual goals of "theory + skills" in vocational education.

Overall, the cultivation of master's degrees in vocational and technical education presents a pattern of "comprehensive institutions taking the lead, application-oriented institutions providing support, and research-oriented institutions offering supplements". Comprehensive institutions have become the main force in cultivation due to their interdisciplinary capabilities, while application-oriented institutions strengthen the practice orientation. Research-oriented institutions have limited participation due to their positioning differences. This distribution reflects the demand of vocational education for compound talent cultivation and the adaptability of institution positioning to the characteristics of vocational education. (see Table 4)

Table 4: Information on Institution Positioning, Number of Degree Programs, and Enrollment Numbers

| **Institution Positioning** | **Number of Degree Programs** | **Proportion** | **Enrollment Numbers** | **Proportion** |
|---|---|---|---|---|
| Research-Oriented Institutions | 5 | 12.8% | 95 | 9.77% |
| Application-Oriented Institutions | 15 | 38.5% | 355 | 36.52% |
| Comprehensive Institutions | 19 | 48.7% | 522 | 53.70% |
| **Total** | **39** | **100.0%** | **972** | **100.00%** |

# IV. Regional Distribution

## (I) Analysis of Provincial Distribution

1.General Distribution Overview

The cultivation system for professional master's degrees in vocational and technical education across the country has a total of 39 degree programs, with a total enrollment of 972 students, covering 19 provincial administrative regions, achieving a coverage rate of 61.3%. Data shows that 12 provinces (such as Anhui, Fujian, Tibet, Qinghai, etc.) have not established any degree programs at all, indicating regional gaps in vocational education resources. From a spatial distribution perspective, the eastern

coastal economic belt (Jiangsu, Shandong, Guangdong) and the southwestern strategic region (Guangxi, Guizhou) form a dual-core resource circle, jointly accounting for 53.8% of the degree programs and 57.3% of the enrollment scale. In contrast, provinces in the northwest, northeast, and some central regions exhibit significant resource deficits.

2.Benchmark Cases of High-Efficiency Cultivation Regions

The Guangxi Zhuang Autonomous Region leads the country with an absolute advantage of 3 degree programs and 148 enrolled students, with an average annual cultivation of 49 students per program. Its cultivation network relies on carriers such as the Vocational and Technical Education College of Guangxi Normal University and the Logistics Management and Engineering College of Nanning Normal University, forming a characteristic model of dual-track parallelism in "teacher education + technology". Although Guizhou Province only has 1 degree program at the International Tourism and Culture College of Guizhou Normal University, it enrolls 77 students annually, ranking first in the country in terms of cultivation efficiency per program, highlighting the market attractiveness of the direction of cultural and tourism integration. Shanghai (1 degree program/70 students) and Guangdong Province (2 degree programs/77 students) achieve a high degree of adaptation between vocational education and regional industries through a deep industry-education collaboration mechanism.

3.Development Bottlenecks in Medium-to-Low Efficiency Regions

Jilin Province ranks first in terms of the total number of degree programs with 4, but only enrolls 64 students, with an average output of 16 students per program, reflecting issues such as resource dispersion and vague positioning. For example, the cross-field exploration of the Culture, Tourism, and Film College of Changchun Normal University has not yet formed a scale effect. Zhejiang Province (2 degree programs/62 students) and Hunan Province (2 degree programs/47 students) rely on normal universities for stable output, but their engineering-related cultivation capabilities are

weak. Although Shandong Province (3 degree programs/68 students) and Jiangsu Province (3 degree programs/63 students) have considerable totals, there is still a 20%-35% gap in cultivation efficiency per program compared to Guangxi and Guizhou.

4.Resource Vacuum Zones and Structural Imbalances

The northwest region (Qinghai, Ningxia, Xinjiang) and the northeast region (Heilongjiang, Liaoning) constitute a "collapsed area" for vocational education, with only Shenyang Normal University in Liaoning Province establishing 1 degree program (enrolling 8 students annually), which is insufficient to support the needs of regional industrial upgrading. Among the six central provinces, Hubei (1 program/18 students), Henan (1 program/12 students), Gansu (2 programs/24 students), etc., have cultivation scales that are less than 50% of the national average of 25 students per program, highlighting the dual lack of policy support and institutional investment. Twelve blank provinces, including Anhui, Fujian, and Hainan, are completely outside the cultivation system for vocational education master's degrees.

Data indicates that the cultivation of professional master's degrees in vocational and technical education in China presents a three-tier gradient pattern of "dual-core siphoning - central collapse - peripheral vacuum". Regional economic levels, the precision of institutional positioning, and the degree of policy resource 倾斜 (favoritism/support) are the core variables affecting the distribution. In the future, it is necessary to address structural contradictions through cross-provincial collaboration mechanisms and differentiated support policies. (see Table 5)

Table 5: Provincial Distribution of Degree Programs and Enrollment Numbers

| Serial No. | Province | Number of Degree Programs | Enrollment Numbers | Serial No. | Province | Number of Degree Programs | Enrollment Numbers |
|---|---|---|---|---|---|---|---|
| 1 | Beijing | 1 | 15 | 17 | Anhui | 0 | 0 |
| 2 | Tianjin | 2 | 48 | 18 | Jiangxi | 1 | 27 |
| 3 | Hebei | 2 | 21 | 19 | Henan | 1 | 12 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | Liaoning | 1 | 8 | 20 | Hubei | 1 | 18 |
| 5 | Shanghai | 1 | 70 | 21 | Hunan | 2 | 47 |
| 6 | Jiangsu | 3 | 63 | 22 | Chongqing | 1 | 30 |
| 7 | Zhejiang | 2 | 62 | 23 | Sichuan | 1 | 10 |
| 8 | Fujian | 0 | 0 | 24 | Guizhou | 1 | 77 |
| 9 | Shandong | 3 | 68 | 25 | Yunnan | 2 | 53 |
| 10 | Guangdong | 2 | 77 | 26 | Tibet | 0 | 0 |
| 11 | Hainan | 0 | 0 | 27 | Shaanxi | 2 | 12 |
| 12 | Guangxi | 3 | 148 | 28 | Gansu | 2 | 24 |
| 13 | Shanxi | 1 | 18 | 29 | Qinghai | 0 | 0 |
| 14 | Inner Mongolia | 0 | 0 | 30 | Ningxia | 0 | 0 |
| 15 | Jilin | 4 | 64 | 31 | Xinjiang | 0 | 0 |
| 16 | Heilongjiang | 0 | 0 | **Total** | | **39** | **972** |

**(II) Economic Regional Distribution**

1.Eastern Region: Prominent Advantages in Resource Agglomeration and Industry-Education Integration

The eastern region dominates with 20 degree programs (accounting for 51.28%) and an enrollment scale of 580 students (accounting for 59.67%), exhibiting a significant "unipolar concentration" characteristic. This pattern is closely related to the high level of industrialization, dense industrial clusters, and policy resource 倾斜 (favoritism/support) in the eastern economic belt. For example, Shanghai relies on the Vocational and Technical Teacher Education College of Shanghai Second Polytechnic University (enrolling 70 students annually) to establish "order-based" cultivation projects in collaboration with enterprises such as Huawei and SAIC Motor, achieving full-chain linkage of "curriculum - practical training - employment". Guangdong Province, through its College of Electromechanical Engineering and College of Electronics and Information Technology at Guangdong Polytechnic Normal University (enrolling 77 students annually), deeply aligns with trillion-yuan industries such as electronic information and new energy vehicles, forming a synergistic effect of "technology research and development - talent cultivation - industrial upgrading". Additionally, Jiangsu Province (3 degree programs/63 students), represented by the Yanpei College of Jiangsu University of Technology, explores an

integrated cultivation model of "theory + craftsmanship spirit" to serve the smart manufacturing needs of the Yangtze River Delta region. The cultivation efficiency in the eastern region (29 students per program) significantly exceeds the national average (25 students per program), benefiting from deep school-enterprise cooperation under market-oriented mechanisms (coverage rate exceeding 60%) and special financial support from local governments (annual investment exceeding ten million yuan).

2.Central and Western Regions: Coexistence of Limited Scale and Structural Challenges

Although the central region has established 10 degree programs (accounting for 25.64%), its enrollment is only 186 students (accounting for 19.14%), with a lower cultivation efficiency per program (18.6 students per program) compared to the western region (22.9 students per program) and the national average, highlighting a tendency to "emphasize declaration over operation". For instance, the Vocational and Technical Teacher Education College of Hubei University of Technology in Hubei Province (enrolling 18 students annually) lacks stable enterprise cooperation bases, resulting in practical courses accounting for less than 30% of the curriculum. The School of Education at Henan University in Henan Province (enrolling 12 students annually) still dominates with a traditional pedagogical framework, failing to effectively integrate with the industrial demands of regional equipment manufacturing and modern agriculture. The western region supports 206 enrollments (accounting for 21.19%) with 9 degree programs (accounting for 23.08%), showing differentiated cultivation efficiency per program: Guangxi (3 programs/148 students) has become a regional benchmark through a dual-track model of "teacher education + logistics", with an enrollment of 49 students per program; however, Gansu (2 programs/24 students), Shaanxi (2 programs/12 students), and other regions have witnessed a continuous shrinkage in cultivation scale due to issues such as vague institutional positioning and disconnection between industry and education. The common contradictions in the central and western regions lie in: first, the weak industrial

foundation leading to insufficient demand for technically skilled positions; second, fragmented policy support, with only a few provinces such as Guizhou and Guangxi in the western region establishing special funds for vocational education, while only Hunan and Hubei among the six central provinces are included in provincial key plans.

Data indicates that the cultivation of professional master's degrees in vocational and technical education in China presents an unbalanced pattern of "unipolar dominance in the east - efficiency collapse in the central region - local highlights in the west". The underlying logic lies in the gradient differences in regional economic vitality, policy precision, and industry-education collaboration capabilities. The east achieves resource siphoning through market-oriented mechanisms and industrial cluster advantages, while the central and western regions are constrained by traditional path dependencies and a lack of systemic support, urgently needing breakthroughs in development bottlenecks through cross-regional linkage and policy innovation. (Table 6)

Table 6: Economic Regional Distribution of Degree Programs and Enrollment Numbers

| Region | Number of Degree Programs | Proportion | Enrollment Numbers | Proportion |
|---|---|---|---|---|
| Eastern | 20 | 51.28% | 580 | 59.67% |
| Central | 10 | 25.64% | 186 | 19.14% |
| Western | 9 | 23.08% | 206 | 21.19% |
| **Total** | **39** | **100.00%** | **972** | **100.00%** |

### (III) Analysis of Primate Distribution

Primate distribution refers to the phenomenon where a certain resource or function within a region is highly concentrated in the administrative or economic primate city (usually the provincial capital or core city), while other cities suffer from resource scarcity or marginalization. In China, professional master's degree programs in vocational education also constitute an educational resource. Therefore, the concept of

primate distribution is applicable to the study of the layout of such degree programs in vocational education. (See Table 7)

1.Primate Distribution Exhibits "Provincial Capital Centralization" Characteristics

From the perspective of the primate distribution of degree programs, the cultivation resources for professional master's degrees in vocational and technical education in China exhibit a pronounced "provincial capital centralization" characteristic. Among the 39 degree programs nationwide, provincial capital cities host 28 (accounting for 71.79%), while local cities only have 11 (accounting for 28.21%). Specifically, the western region has the highest concentration in provincial capitals, with 8 out of 9 degree programs (88.89%) distributed in provincial capitals, such as Nanning in Guangxi (Guangxi Normal University) and Guiyang in Guizhou (Guizhou Normal University). The central region follows, with provincial capitals accounting for 80.00% of the 10 degree programs, typical representatives including Wuhan in Hubei (Hubei University of Technology) and Zhengzhou in Henan (Henan University). Despite the economic prosperity of the eastern region, 60.00% of its degree programs are still concentrated in provincial capitals (such as Nanjing and Guangzhou), while local cities only account for 40.00% (such as Changzhou in Jiangsu and Jining in Shandong). This distribution pattern reflects the universal law of a high tilt of educational resources towards administrative centers, especially in the central and western regions, where local economies and policy support capabilities are insufficient, making them more reliant on provincial capitals to carry out core vocational education functions.

2.Structural Differences Between Provincial Capitals and Local Cities

The trend of degree program centralization in provincial capital cities is closely related to regional development levels. Due to the weak industrial foundation and limited financial investment in local cities of central and western provinces (such as Lanzhou in Gansu and Xi'an in Shaanxi), vocational education resources almost entirely depend on provincial capitals, leading to a phenomenon of "one city

dominating". For example, there is only 1 degree program (accounting for 11.11%) in non-provincial capital cities in the western region, concentrated in Liuzhou, Guangxi (a branch campus of Nanning Normal University), which is insufficient to meet the wide-ranging cultivation needs. Although the eastern region has a lower overall concentration, local degree programs are mostly distributed in economically strong cities (such as Suzhou and Dongguan), achieving characteristic development by relying on local industrial clusters (such as smart manufacturing in Suzhou and electronic information in Dongguan). However, local degree programs in the eastern region still face challenges of "policy marginalization". For instance, vocational education projects in Foshan, Guangdong, often need to be jointly applied for with institutions in Guangzhou, indicating weak independence. Overall, while provincial capital centralization can enhance resource integration efficiency in the short term, it may exacerbate educational inequity within regions in the long run and constrain the cultivation of talent tailored to local industries. In the future, it is necessary to gradually optimize the spatial balance of vocational education resources through mechanisms such as policy guidance (e.g., local special subsidies) and cross-city collaboration (e.g., provincial capital-local joint cultivation bases).

Table 7: Primate Distribution of Degree Programs and Enrollment Numbers

| Region | Number of Degree Programs | Provincial Capitals | Proportion | Local Cities | Proportion |
|---|---|---|---|---|---|
| Eastern | 20 | 12 | 60.00% | 8 | 40.00% |
| Central | 10 | 8 | 80.00% | 2 | 20.00% |
| Western | 9 | 8 | 88.89% | 1 | 11.11% |
| **Total** | **39** | **28** | **71.79%** | **11** | **28.21%** |

# IV. Analysis of Enrollment Scale and Research Directions

## (I) Analysis of Top 10 Institutions by Total Enrollment

Among the top 10 institutions in terms of enrollment scale for professional master's degrees in vocational and technical education nationwide, Nanning Normal University ranks first with 95 students, accounting for 9.78% of the total enrollment. Guizhou

Normal University (77 students, 7.92%) and Shanghai Second Polytechnic University (70 students, 7.20%) follow in second and third place, respectively. Other institutions include Jiangsu University of Technology (50 students, 5.14%), Yunnan University (45 students, 4.63%), Zhejiang Normal University (56 students, 5.76%), Guangdong Polytechnic Normal University (43 students, 4.42%), Guangxi Normal University (43 students, 4.42%), Hunan University of Science and Technology (36 students, 3.70%), and Chongqing Normal University (30 students, 3.09%). The combined enrollment of these top 10 institutions accounts for 56.07% of the total, highlighting the trend of resource concentration towards leading institutions.

**(II) Distribution of Research Directions Among Top 10 Institutions by Total Enrollment**

The research directions of these institutions primarily focus on tourism services, finance and commerce, equipment manufacturing, and electronic information. Nanning Normal University covers six directions, with tourism services (21 students) and finance and commerce (32 students) accounting for 55.79% of its enrollment. Guizhou Normal University enrolls 32 students in tourism services (41.56% of its total), deeply integrating with the cultural tourism industry. Shanghai Second Polytechnic University focuses on equipment manufacturing and electronic information, with 30 students each (accounting for 85.71% of its total), aligning with high-end manufacturing. Jiangsu University of Technology has a balanced layout across five directions, with equipment manufacturing and electronic information each accounting for 20%. Yunnan University specializes in marketing (22 students) and tourism services (23 students), accounting for 87.76% of its enrollment.

**(III) Top Five Research Directions by Frequency**

In terms of the frequency of offerings, tourism services (offered by 25 institutions), finance and commerce (23 institutions), equipment manufacturing (18 institutions), electronic information (17 institutions), and information technology (15 institutions) are the top five research directions. Tourism services cover 64.10% of institutions,

finance and commerce account for 58.97%, equipment manufacturing and electronic information account for 46.15% and 43.59%, respectively, and information technology accounts for 38.46%. These directions have become mainstream choices due to their broad market demand and strong adaptability to institutional resources.

**(IV) Enrollment Scale of Top Five Research Directions by Frequency**

Tourism services lead with 236 students (24.28%), with significant contributions from Guizhou Normal University (32 students) and Yunnan University (23 students). Finance and commerce enroll 167 students (17.18%), with Nanning Normal University (32 students) and Zhejiang Normal University (15 students) as the core contributors. Equipment manufacturing (105 students, 10.80%) and electronic information (87 students, 8.95%) are concentrated in Shanghai Second Polytechnic University (30 students each) and Guangdong Polytechnic Normal University (12 students and 10 students, respectively). Information technology enrolls 89 students (9.15%), dispersed among institutions such as Beijing Union University (3 students) and Hebei Normal University (6 students), with relatively low enrollment per institution.

**(V) Distribution of Top Five Research Directions by Enrollment Scale**

Sorted by enrollment scale, the top five directions are: tourism services (236 students, 24.28%), finance and commerce (167 students, 17.18%), equipment manufacturing (105 students, 10.80%), information technology (89 students, 9.15%), and electronic information (87 students, 8.95%), collectively accounting for 70.36% of the total enrollment. Tourism services and finance and commerce dominate due to their strong applicability and broad employment prospects. Equipment manufacturing and electronic information have formed significant scales 依托于 (relying on) eastern industrial advantages, but exhibit regional distribution imbalances (with over 75% in the eastern region).

Data indicates that the current cultivation of professional master's degrees in vocational and technical education is characterized by "centralization at the top, convergence in directions, and regional differentiation". The top 10 institutions absorb over half of the resources, and the top five directions account for 70% of the enrollment scale. However, excessive reliance on popular fields leads to homogeneous competition, as evidenced by 20 institutions offering finance and commerce. Eastern institutions leverage industrial advantages to strengthen engineering directions, while central and western institutions are constrained by traditional disciplinary inertia. In the future, it is necessary to optimize the layout of research directions through policy guidance, promote the characteristic development of "niche fields" such as digital media design and Chinese herbal medicine cultivation, and strengthen inter-regional resource collaboration to address structural imbalances. (See Table 8)

Table 8: Enrollment Scale and Research Directions

| Institution | Total Enrollment | Enrollment by Research Direction | Research Direction |
|---|---|---|---|
| Beijing Union University | 15 | 3 | Finance and Commerce |
| | | 3 | Information Technology |
| | | 3 | Tourism Services |
| | | 3 | Transportation |
| | | 3 | Culture and Arts |
| Tianjin University | 16 | 4 | Processing and Manufacturing |
| | | 4 | Information Technology |
| | | 4 | Petroleum and Chemical Engineering |
| | | 4 | Energy and New Energy |
| Tianjin University of Technology and Education | 32 | 8 | Equipment Manufacturing |
| | | 5 | Electronic Information |
| | | 5 | Equipment Manufacturing |
| | | 5 | Electronic Information |
| | | 2 | Transportation |
| | | 5 | Finance and Commerce |
| | | 2 | Culture and Arts |
| Hebei Normal University | 11 | 6 | Information Technology |
| | | 5 | Processing and |

| | | | |
|---|---|---|---|
| | | | Manufacturing |
| Hebei Normal University of Science and Technology | 10 | 10 | Finance and Commerce |
| Shanghai Second Polytechnic University | 70 | 30 | Equipment Manufacturing |
| | | 30 | Electronic Information |
| | | 10 | Finance and Commerce |
| Nanjing Normal University | 8 | 4 | Processing and Manufacturing |
| | | 4 | Tourism Services |
| Jiangsu Normal University | 5 | 5 | Undifferentiated Research Direction |
| Jiangsu University of Technology | 50 | 10 | Equipment Manufacturing |
| | | 10 | Electronic Information |
| | | 10 | Finance and Commerce |
| | | 10 | Tourism Services |
| | | 10 | Culture and Arts |
| Zhejiang University of Technology | 6 | 3 | Processing and Manufacturing |
| | | 3 | Information Technology |
| Zhejiang Normal University | 56 | 15 | Finance and Commerce |
| | | 16 | Tourism Services |
| | | 8 | Processing and Manufacturing |
| | | 8 | Information Technology |
| | | 9 | Transportation |
| Ocean University of China | 2 | 2 | Undifferentiated Research Direction |
| Shandong Normal University | 54 | 10 | Resources and Environment |
| | | 10 | Information Technology |
| | | 10 | Special Program in Vocational and Technical Education |
| | | 24 | Tourism Services |
| Qufu Normal University | 12 | 7 | Judicial Services |
| | | 5 | Tourism Services |
| South China Normal University | 34 | 10 | Business English |
| | | 11 | E-commerce |
| | | 13 | Tourism Services |
| Guangdong Polytechnic Normal University | 43 | 12 | Equipment Manufacturing |
| | | 8 | Finance and Commerce |
| | | 5 | Tourism Services |

| | | | |
|---|---|---|---|
| | | 10 | Electronic Information |
| | | 8 | Transportation |
| Shanxi University | 18 | 6 | Tourism Services |
| | | 6 | Information Technology |
| | | 6 | Finance and Commerce |
| Jiangxi Science and Technology Normal University | 27 | 6 | Finance and Commerce |
| | | 9 | Tourism Services |
| | | 5 | Electronic Information |
| | | 7 | Information Technology |
| Henan University | 12 | 12 | Undifferentiated Research Direction |
| Hubei University of Technology | 18 | 6 | Processing and Manufacturing |
| | | 6 | Finance and Commerce |
| | | 6 | Information Technology |
| Hunan University of Science and Technology | 36 | 5 | Equipment Manufacturing |
| | | 5 | Biology and Chemical Engineering |
| | | 5 | Electronic Information |
| | | 6 | Public Administration and Services |
| | | 10 | Tourism Services |
| | | 5 | Energy, Power, and Materials |
| Hunan Normal University | 11 | 6 | Tourism Services |
| | | 5 | Undifferentiated Research Direction |
| Guangxi University of Science and Technology | 10 | 10 | Equipment Manufacturing |
| Guangxi Normal University | 43 | 9 | Tourism Services |
| | | 12 | Equipment Manufacturing |
| | | 7 | Electronic Information |
| | | 6 | Culture and Arts |
| | | 9 | Finance and Commerce |
| Nanning Normal University | 95 | 16 | Finance and Commerce |
| | | 21 | Tourism Services |
| | | 13 | Culture and Arts |
| | | 16 | Information Technology |
| | | 16 | Finance and Commerce |
| | | 13 | Culture and Arts |
| Chongqing Normal University | 30 | 30 | Tourism Services |
| Sichuan University of | 10 | 5 | Processing and |

| | | | |
|---|---|---|---|
| Science and Engineering | | | Manufacturing |
| | | 5 | Civil Engineering and Water Conservancy |
| Guizhou Normal University | 77 | 7 | Information Technology |
| | | 23 | Finance and Commerce |
| | | 6 | Civil Engineering and Water Conservancy |
| | | 9 | Processing and Manufacturing |
| | | 32 | Tourism Services |
| Yunnan University | 45 | 22 | Marketing |
| | | 23 | Tourism Services |
| Yunnan Normal University | 8 | 8 | Undifferentiated Research Direction |
| Shaanxi University of Science and Technology | 4 | 4 | Public Administration and Services |
| Shaanxi Normal University | 8 | 8 | Undifferentiated Research Direction |
| Northwest Normal University | 22 | 13 | Information Technology |
| | | 3 | Agricultural Product Storage and Processing |
| | | 3 | Plant Protection |
| | | 3 | Chinese Herbal Medicine Cultivation |
| Northwest Minzu University | 2 | 2 | Digital Media Design |
| Shenyang Normal University | 8 | 4 | Finance and Commerce |
| | | 4 | Tourism Services |
| Jilin Agricultural University | 5 | 2 | Public Administration and Services |
| | | 2 | Journalism and Communication |
| | | 1 | Culture and Arts |
| Jilin Engineering Normal University | 15 | 5 | Finance and Commerce |
| | | 5 | Equipment Manufacturing |
| | | 5 | Electronic Information |
| Jilin International Studies University | 15 | 5 | Finance and Commerce |
| | | 5 | Education and Arts |
| | | 5 | Culture and Arts |
| Changchun Normal University | 29 | 5 | Electronic Information |
| | | 8 | Equipment Manufacturing |
| | | 10 | Finance and Commerce |
| | | 6 | Tourism Services |

## V. Core Issues in the Layout of Professional Master's Degree Programs in Vocational Education in China

### (1) Imbalanced Regional Distribution, with Resources Showing a "Strong East, Weak West" Pattern

Professional master's degree programs in vocational education in China are highly concentrated in the eastern region, with eastern provinces accounting for 51.28% of the degree programs and 59.67% of the enrollment scale, forming a "unipolar concentration" trend. Economically strong provinces such as Jiangsu and Guangdong, relying on industrial clusters (e.g., electronic information in Guangdong and intelligent manufacturing in Jiangsu) and policy support, have become core training areas. In contrast, 12 provinces in the central and western regions (e.g., Anhui, Qinghai, Tibet) have no degree programs at all, with the northwest and northeast regions (e.g., Qinghai, Xinjiang, Heilongjiang) becoming "resource collapse zones." Even with local highlights (e.g., 3 degree programs/148 students in Guangxi, 1 program/77 students in Guizhou), it is difficult to reverse the regional fault issue. The total enrollment in the nine western provinces accounts for only 21.19% of the national total, and the northeast region only has one program in Liaoning (with an annual enrollment of 8 students), indicating a severe disconnect between vocational education resources and regional industrial demands.

### (2) Vague Institution Types and Positioning, Insufficient Adaptability of the Training System

Normal universities dominate the training system with 56.4% of the degree programs and 65.64% of the enrollment, but their academic inertia leads to weak engineering practical abilities. For example, Guangxi Normal University and Shaanxi Normal University still primarily adhere to traditional pedagogical frameworks, making it difficult to align with the technological upgrading needs of the manufacturing industry. Although science and engineering universities (accounting for 17.9%) focus

on engineering and technological fields (e.g., the School of Mechanical Engineering at Tianjin University of Technology and Education), the coverage rate of industry-education integration is less than 40%, with some universities (e.g., Hubei University of Technology) having practical course proportions below 30%. Research-oriented universities (e.g., Ocean University of China, Northwest Normal University) have only 154 students enrolled in 9 degree programs due to deviations in academic positioning, with a single-point efficiency (17 students/program) less than 70% of the national average (25 students/program), indicating significant resource misallocation.

**(3) Serious Homogenization of Research Directions, Lagging Development in Emerging Fields**

The clustering of popular research directions is prominent, with tourism services (24.28%), finance and commerce (17.18%), and equipment manufacturing (10.80%) accounting for 52.26% of the total enrollment. Twenty-five universities offer tourism services, and 20 universities cluster in finance and commerce, leading to redundant construction and resource waste. In contrast, fields urgently needed by national strategies, such as modern agriculture, digital media design, and Chinese herbal medicine cultivation, have a coverage rate of less than 10%, only sporadically distributed in universities such as Northwest Minzu University (digital media design) and Northwest Normal University (Chinese herbal medicine cultivation), with annual enrollments all below 5 students. Homogenized competition not only weakens the industrial adaptability of vocational education but also continues to widen the gap in technical and skilled talent in emerging fields.

**(4) Unreasonable Primary Distribution, Provincial Capital Concentration Leading to Local Resource Scarcity**

Seventy-one point seven nine percent (71.79%) of the degree programs nationwide are concentrated in provincial capital cities, particularly pronounced in the central and western regions (88.89% in the west, 80% in the central region). For example, all

three degree programs in Guangxi are located in Nanning, and the only program in Guizhou is set up in Guiyang, leaving vocational education resources in local cities (e.g., Liuzhou, Zunyi) nearly blank. Although some economically strong cities in the eastern region (e.g., Suzhou, Dongguan) have established degree programs relying on industrial clusters, they still rely on policy support from provincial capitals (e.g., vocational education projects in Foshan, Guangdong, need to be jointly applied for with universities in Guangzhou). The concentration in provincial capitals exacerbates educational resource inequality within regions, with local cities struggling to independently cultivate vocational education talents suited to local needs due to insufficient financial investment and weak industrial synergy capabilities, leading to a vicious cycle of "provincial capital siphoning - local bleeding."

## VI. Suggestions for Optimizing the Layout of Professional Master's Degree Programs in Vocational Education in China

### (1) Promote Cross-Regional Collaboration to Break the "Strong East, Weak West" Pattern

To address the imbalance in regional resources, it is necessary to establish a collaborative mechanism of "eastern regions providing counterpart support to the central and western regions." For example, eastern provinces such as Jiangsu and Guangdong can leverage their industrial advantages (e.g., intelligent manufacturing in Jiangsu and electronic information in Guangdong) to enhance vocational education capabilities in the central and western regions through cross-provincial co-construction of training bases (e.g., Jiangsu University of Technology providing counterpart support to vocational colleges in Xinjiang) and joint teacher training. Meanwhile, for provinces with no degree programs, such as Anhui and Qinghai, a "degree program quota system" should be implemented, prioritizing support for the establishment of degree programs based on regional characteristics (e.g., new energy in Qinghai and modern agriculture in Anhui), with special financial subsidies provided. Through policy 倾斜 (preferential policies) and resource complementarity,

the gap in training scale between the eastern and western regions should be gradually narrowed to achieve full coverage of vocational education resources across the country.

**(2) Clarify the Classification and Positioning of Institutions to Optimize the Adaptability of the Training System**

It is necessary to formulate differentiated training paths based on institution types: Normal universities (e.g., Guangxi Normal University) should focus on cultivating vocational education teachers and strengthen the curriculum design for "dual-qualified" teachers; science and engineering universities (e.g., Tianjin University of Technology and Education) need to deepen industry-education integration, co-construct "order-based classes" with leading enterprises (e.g., Huawei and BYD), and increase the proportion of technical practical courses to over 40%; comprehensive universities (e.g., Yunnan University) should promote interdisciplinary integration, combining resources in pedagogy, engineering, and management to serve the demand for regional compound talents. In addition, a "dynamic exit mechanism" should be established to merge or reorganize inefficient degree programs with less than 15 students enrolled for three consecutive years (e.g., the Basic Education Center of Ocean University of China), ensuring precise allocation of resources.

**(3) Support Emerging Fields and Guide the Characterization of Research Directions**

To break the homogenized competition, it is necessary to provide special subsidies for emerging fields such as modern agriculture, digital media design, and Chinese herbal medicine cultivation, guided by national strategic demands, and encourage institutions to apply for characteristic directions (e.g., digital media design at Northwest Minzu University, integration of culture and tourism at Guizhou Normal University). Meanwhile, a "demand-responsive professional catalog" should be established to dynamically adjust the layout of research directions, such as adding industrial internet

directions in line with the "manufacturing powerhouse" strategy and offering agricultural IoT courses centered around "rural revitalization." Through policy guidance and financial support, the enrollment ratio between popular directions (tourism services, finance and commerce) and niche fields should be optimized from 7:3 to 5:5, enhancing the adaptability of vocational education to industrial upgrading.

**(4) Strengthen Local Resource Supply to Alleviate the Contradiction of Provincial Capital Concentration**

To address the siphon effect of provincial capital resources, it is necessary to support economically strong local cities in independently establishing degree programs (e.g., intelligent manufacturing in Suzhou, electronic information in Dongguan) to reduce reliance on provincial capital institutions. For local cities in the central and western regions (e.g., Liuzhou in Guangxi, Jiuquan in Gansu), the construction of "provincial capital-local joint training bases" (e.g., a logistics engineering center co-constructed by Nanning and Liuzhou) should be promoted to enhance resource radiation capabilities through teacher sharing and credit recognition. In addition, a "local vocational education special fund" should be established to prioritize support for institutions in non-provincial capital cities (e.g., Liuzhou Vocational and Technical Teachers College) to align with local industrial demands (e.g., automobile manufacturing, characteristic agriculture), constructing a "one city, one characteristic" vocational education ecosystem to break the dilemma of "provincial capital dominance-local resource depletion."

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