

The Development Status of Sino-Foreign Cooperative Education Programs in Higher Vocational Education Based on Quantitative Data Analysis

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Abstract

On the basis of the program list released by the Ministry of Education in China, there are 893 Sino-foreign cooperative programs in higher vocational education nationwide, with a total enrollment scale of 67,715 students. The regional distribution displays a decrease from the eastern area to the western area on educational programs and enrollment scale. A total of 228 majors are enrolled in the program, among which Accounting is the most popular, followed by Computer Application Technology. The convergence of specialty settings is serious. Jiangsu has the most foreign-partner universities, followed by Zhejiang and Shandong. In the same province, municipality and autonomous region, the number of foreign-partner universities is generally more than that of Chinese partner universities. Foreign partner universities are mainly from Australia, Canada, the United Kingdom and the United States, mainly in developed countries. The development scale of Sino-foreign cooperative programs is closely connected with the development and demand of regional economy. In terms of policy, Sino-foreign cooperative programs in western China and in remote and poor areas should be encouraged. China can combine its own professional advantages with foreign high-quality educational resources to set up characteristic cooperative programs.

Key Words: *quantitative data analysis, higher vocational education, Sino-foreign cooperative programs, development status*

Introduction

Sino-foreign cooperative education programs are conducive to the introduction of high-quality foreign educational resources, thereby facilitating the enhancement of the educational standards of domestic higher education institutions. Article 3 of the General Provisions of the Regulations of the People's Republic of China on Sino-Foreign Cooperation in Running Schools stipulates that the state encourages the establishment of Sino-foreign cooperative education programs in the fields of higher education and vocational education, and supports cooperation between Chinese higher education institutions and renowned foreign counterparts. Such collaborative endeavors are beneficial for nurturing internationally-oriented talents and promoting harmonious economic and social development. By actively engaging in Sino-foreign cooperative education, international exchanges and cooperation can be furthered, enabling China's higher vocational education to align more swiftly with international educational standards and propel economic and social progress (Liu Chao, 2010: 118). The implementation of Sino-foreign cooperative education programs can broaden educational horizons, enhance students' global perspectives, and cultivate talents with international competencies. This form of collaboration is advantageous for the diversified development of students (Sun Ling, 2018: 19).

Currently, research on Sino-foreign cooperative education programs predominantly focuses on the exploration of teaching quality and cultivation models, or analyzes higher vocational education programs across various provinces and municipalities. For instance, Liu Wei (2011) examined the current state of Sino-foreign cooperative education in Shanghai's higher vocational colleges; Li Wei and Wang Jing (2012), as well as Guo Wenling and Wang Jianli (2015), conducted studies on such programs in Beijing's higher vocational institutions; Li Aijun (2012) investigated the situation in Henan's higher vocational Sino-foreign cooperative education; Huang Hua and Ma Rong (2013), along with Yuan Jingyu (2014), explored the scenario in Jiangsu's higher vocational education; Wang Xu and Han Lili (2013) identified issues and

proposed solutions for Sino-foreign cooperative education in Liaoning's higher vocational colleges; He Beibei (2015) analyzed the current state of such programs in Guangdong's higher vocational institutions; Lu Shenglan (2016) surveyed the situation in Zhejiang's higher vocational colleges; Tang Yiming (2016) researched the current status and countermeasures for Sino-foreign cooperative education in Hubei's higher vocational institutions; Jiang Shuai et al. (2019) discussed the current state of Sino-foreign cooperative education in Hunan's higher vocational education; Li Qiaoning (2020) pointed out the dilemmas faced by Sino-foreign cooperative education in Jiangsu's higher vocational colleges and proposed strategies; Kong Jing et al. (2020) analyzed countermeasures for the issues in Sino-foreign cooperative education projects in Shandong's higher vocational institutions, and so forth.

To comprehensively and clearly understand the situation of cooperative education programs, this paper will commence with an examination of Sino-foreign cooperative education programs in higher vocational education nationwide, employing quantitative data analysis to explore their distribution, enrollment numbers, disciplines offered, and the profiles of participating Chinese and foreign higher education institutions.

2. Investigation into the Current Status of Programs

Based on the list of Sino-foreign cooperative education programs, those in higher vocational education are established and operated with local approval in accordance with the law, and reported to the Ministry of Education for record-keeping. These programs primarily operate at the higher vocational education level and are categorized as such, being included in the national enrollment plan for regular higher education, while also encompassing other educational formats. Currently, there are a total of 893 active higher vocational education programs (excluding those that have ceased operations or suspended enrollment). The distribution of these programs across

various provinces (municipalities, autonomous regions) is as follows (as shown in Table 1):

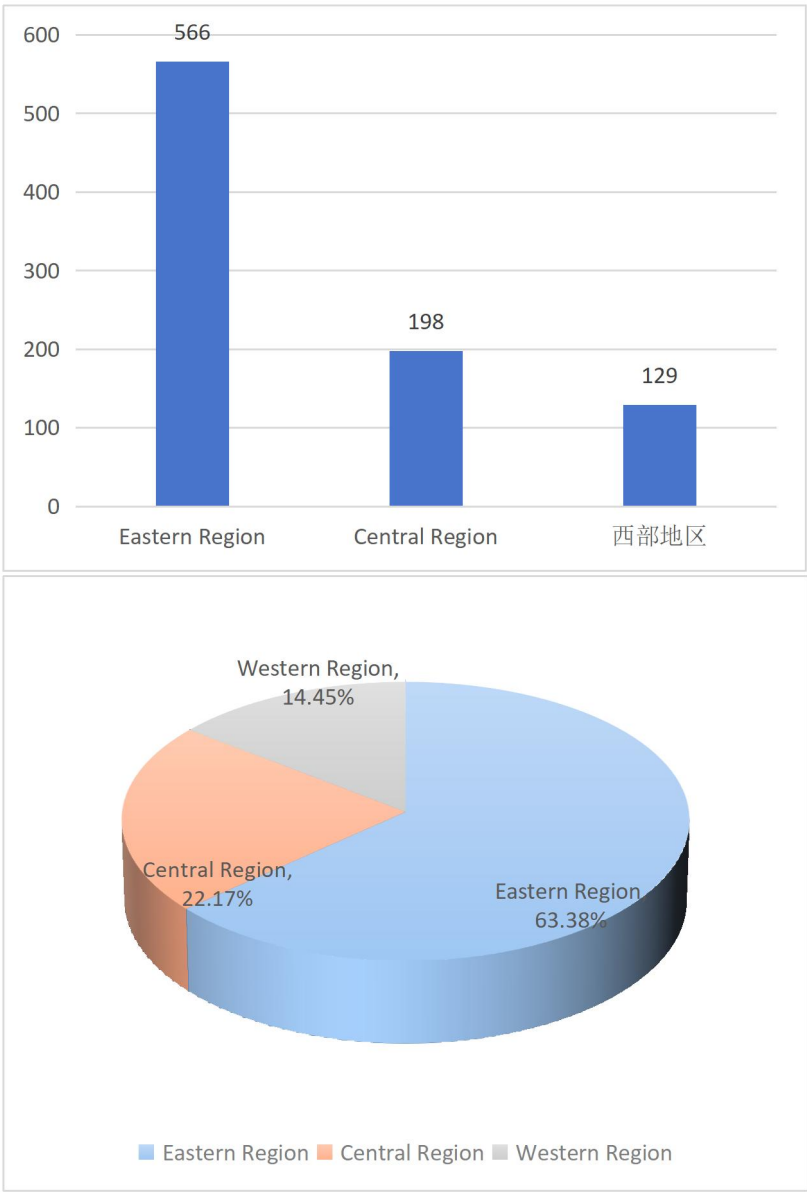
Serial No.	Region	Number of Programs	Serial No.	Region	Number of Programs
1	Jiangsu	180	17	Guizhou	14
2	Zhejiang	80	18	Guangxi	13
3	Shandong	72	19	Henan	13
4	Hebei	62	20	Yunnan	13
5	Shanghai	57	21	Shaanxi	11
6	Hubei	55	22	Xinjiang	10
7	Guangdong	50	23	Inner Mongolia	9
8	Sichuan	35	24	Fujian	6
9	Hunan	33	25	Tianjin	6
10	Beijing	31	26	Heilongjiang	5
11	Anhui	28	27	Liaoning	3
12	Shanxi	23	28	Gansu	1
13	Chongqing	22	29	Qinghai	1
14	Jiangxi	22	30	Ningxia	0
15	Hainan	19	31	Tibet	0
16	Jilin	19	32	Total	893

Among all provinces (municipalities, autonomous regions), Jiangsu hosts the highest number of Sino-foreign cooperative education programs, totaling 180 projects, with 30 projects having already ceased operations or been deregistered. This figure for discontinued projects in Jiangsu also ranks the highest nationwide. Zhejiang follows with 80 projects in total, among which 10 programs have been terminated or suspended in enrollment. Shandong has 72 projects, Hebei boasts 62 cooperative programs, Shanghai records 57 cooperative projects, Hubei encompasses 55 projects, and Guangdong comprises 50 projects.

For regions with fewer than 10 cooperative programs: Inner Mongolia has only 9 projects, with 3 programs having ceased operations or suspended enrollment. Fujian and Tianjin each have 6 projects, with Tianjin additionally witnessing the deregistration of 2 programs. Heilongjiang accounts for 5 projects, Liaoning for 3

projects, while Gansu and Qinghai have only 1 project each. Notably, Ningxia and Tibet have no cooperative projects established thus far.

Figure 1. Regional Distribution of Sino-foreign Cooperative Education Programs



The regional distribution (as shown in Figure 1) indicates a decreasing trend in the number of vocational programs from the eastern to the western regions. Among the 893 programs nationwide, 566 are located in the eastern region, accounting for more than half of the total (63.38%), primarily in economically and educationally developed areas. The central region hosts 198 programs, accounting for 22.17% of the total, while the western region has only 129 programs, representing 14.45% of the

total. This distribution suggests that the less economically developed western region is relatively weaker in terms of the speed and scale of developing cooperative education programs. The following analysis examines the total number of programs, enrollment size, disciplines offered, and the profiles of participating Chinese and foreign institutions by region.

2.1 Eastern Region

(1) Jiangsu: Excluding 30 discontinued or deregistered programs, Jiangsu has 180 programs. Among them, 2 programs offer independent enrollment and award foreign vocational certificates. Another 2 programs provide non-degree course training with a one-year duration, recruiting students from existing campuses. The total enrollment is 10,067 students across 82 disciplines, with popular fields including Accounting (12 programs), Hotel Management (10 programs), and International Business (9 programs). The largest enrollments are in Hotel Management (685 students), International Business (550 students). There are 66 Chinese partner institutions and 93 foreign partner institutions, with most foreign partners hailing from Canada (41 programs), Australia (38 programs), and the United States (29 programs).

(2) Zhejiang: Excluding 10 discontinued or deregistered programs, Zhejiang has 80 programs with a total enrollment of 7,006 students across 48 disciplines. Popular fields include International Business (4 programs), Nursing (4 programs), Accounting (4 programs), Mechatronics Technology (4 programs), and Hotel Management (4 programs). The largest enrollments are in International Business (390 students), Accounting (390 students), and Mechatronics Technology (380 students). There are 33 Chinese partner institutions and 58 foreign partner institutions, with most foreign partners from Australia (23 programs), the United States (20 programs), and New Zealand (7 programs).

(3) Shandong: There are 72 programs with a total enrollment of 5,655 students across 42 disciplines. Popular fields include Accounting (9 programs), Nursing (5 programs),

Computer Application Technology (5 programs), and Software Technology (5 programs). The largest enrollments are in Accounting (850 students), Nursing (450 students), and Software Technology (410 students). There are 40 Chinese partner institutions and 53 foreign partner institutions, with most foreign partners from South Korea (24 programs), the United States (13 programs), and Australia (8 programs).

(4) Hebei: There are 62 programs with a total enrollment of 4,875 students across 36 disciplines. Popular fields include Accounting (4 programs), Mechatronics Technology (4 programs), and Tourism Management (4 programs). The largest enrollments are in Accounting (400 students), Software Technology (260 students), and Tourism Management (250 students). There are 22 Chinese partner institutions and 30 foreign partner institutions, with most foreign partners from Germany (13 programs), South Korea (11 programs), Australia (7 programs), and Canada (7 programs).

(5) Shanghai: There are 57 programs with a total enrollment of 4,410 students across 40 disciplines. Popular fields include International Business (4 programs), Mechatronics Technology (4 programs), Accounting (4 programs), and Nursing (4 programs). The largest enrollments are in Mechatronics Technology (350 students), Business English (350 students), and Accounting (330 students). There are 30 Chinese partner institutions and 43 foreign partner institutions, with most foreign partners from the United States (15 programs), Australia (10 programs), Canada (6 programs), and Japan (6 programs).

(6) Guangdong: There are 50 programs with a total enrollment of 5,705 students across 34 disciplines. Popular fields include International Business (3 programs), Accounting (3 programs), Computer Application Technology (3 programs), Tourism Management (3 programs), Business Management (3 programs), and Marketing (3 programs). The largest enrollments are in Flight Attendant (700 students), Aircraft Mechatronics Equipment Maintenance (500 students), and Business Management (450 students). There are 28 Chinese partner institutions and 30 foreign partner

institutions, with most foreign partners from Australia (18 programs), Canada (12 programs), and the United Kingdom (9 programs).

(7) Beijing: There are 31 programs with a total enrollment of 1,405 students across 22 disciplines. Popular fields include Accounting (3 programs) and Automotive Inspection and Maintenance Technology (3 programs). The largest enrollments are in Accounting (140 students), Automotive Inspection and Maintenance Technology (120 students), Elderly Care Services and Management (100 students), and Nursing (100 students). Most programs award both Chinese and foreign certificates, with programs in cooperation with Germany having a duration of 3.5 years. There are 12 Chinese partner institutions and 15 foreign partner institutions, with most foreign partners from Germany (10 programs), the United Kingdom (8 programs), and the United States (4 programs).

(8) Hainan: There are 19 programs with a total enrollment of 1,570 students across 14 disciplines. Popular fields include Tourism Management (3 programs), Accounting (2 programs), Hotel Management (2 programs), and Marketing (2 programs). The largest enrollments are in Tourism Management (300 students), Hotel Management (220 students), and Accounting (200 students). There are 8 Chinese partner institutions and 9 foreign partner institutions, with most foreign partners from Australia (6 programs), Canada (4 programs), and the United States (4 programs).

(9) Fujian: There are 6 programs with a total enrollment of 700 students across 6 disciplines, including Electrical Automation Technology, Business Management, International Economics and Trade, Accounting, Mechanical Design and Manufacturing, and Construction Engineering Management. The largest enrollments are in Electrical Automation Technology, International Economics and Trade, Accounting, and Construction Engineering Management, each with 150 students. There are 3 Chinese partner institutions and 3 foreign partner institutions, with most foreign partners from Malaysia (2 programs), Australia (2 programs), and the United States (2 programs).

(10) Tianjin: Excluding 2 deregistered programs, there are currently 6 programs with a total enrollment of 370 students across 6 disciplines, including Marketing, Human Resources Management, Oil and Gas Extraction Technology, New Energy Application Technology, Software Technology, and Accounting. The largest enrollments are in New Energy Application Technology (100 students), followed by Human Resources Management (90 students), and Accounting and Software Technology, each with 60 students. All programs award both Chinese and foreign certificates, with the Chinese side granting higher vocational graduation certificates and the foreign side granting relevant diplomas, grade certificates, or course completion certificates. There are 5 Chinese partner institutions and 5 foreign partner institutions, with most foreign partners from the United States (3 programs), Australia (2 programs), and New Zealand (1 program).

(11) Liaoning: There are 3 programs with a total enrollment of 92 students across 3 disciplines, with no repeated establishment of the same discipline. The disciplines include Hotel Management, Automotive Application and Maintenance Technology, and Logistics Management. Enrollment in all disciplines is relatively low, at around 30 students each. There are 2 Chinese partner institutions and 2 foreign partner institutions, with all foreign partners from Canada (3 programs).

2.2 Central Region

(1) Hubei: There are 55 programs with a total enrollment of 3,350 students across 34 disciplines. Popular fields include Tourism Management (5 programs), Mechatronics Technology (4 programs), and Construction Engineering Technology (4 programs). The largest enrollments are in Tourism Management (340 students), Mechatronics Technology (240 students), and Construction Engineering Technology (210 students). There are 30 Chinese partner institutions and 37 foreign partner institutions, with most foreign partners from Australia (18 programs), the United States (10 programs), and Canada (6 programs).

(2) Hunan: There are 33 programs with a total enrollment of 2,960 students across 21 disciplines. Popular fields include Accounting (5 programs), Marketing (4 programs), International Business (3 programs), and Hotel Management (3 programs). The largest enrollments are in Accounting (430 students), Marketing (340 students), and Hotel Management (320 students). There are 15 Chinese partner institutions and 16 foreign partner institutions, with most foreign partners from Australia (11 programs), the United Kingdom (12 programs), Canada (3 programs), and Russia (3 programs).

(3) Anhui: There are 28 programs with a total enrollment of 2,165 students across 23 disciplines. Popular fields include Accounting (4 programs), Hotel Management (2 programs), and Business English (2 programs). The largest enrollments are in Accounting (510 students), Financial Management and Practice (250 students), and E-commerce (140 students). There are 12 Chinese partner institutions and 14 foreign partner institutions, with most foreign partners from Australia (15 programs), Ireland (4 programs), the United Kingdom (3 programs), and Canada (3 programs).

(4) Shanxi: There are 23 programs with a total enrollment of 1,410 students across 19 disciplines. Popular fields include Accounting (3 programs) and Mechanical Manufacturing and Automation (3 programs). The largest enrollments are in Mechanical Manufacturing and Automation (170 students), Accounting (160 students), and Power Plant and Power System (150 students). There are 12 Chinese partner institutions and 11 foreign partner institutions, with most foreign partners from Canada (10 programs), the United Kingdom (3 programs), Australia (3 programs), and Japan (3 programs).

(5) Jiangxi: Excluding 9 discontinued programs, there are 22 programs with a total enrollment of 1,490 students across 17 disciplines. Popular fields include E-commerce (3 programs), Accounting (2 programs), Tourism Management (2 programs), and Automotive Inspection and Maintenance Technology (2 programs). The largest enrollments are in E-commerce (250 students), Accounting (150 students), and Tourism Management (150 students). There are 8 Chinese partner institutions and 29

foreign partner institutions, with most foreign partners from South Korea (6 programs), the United Kingdom (4 programs), Australia (4 programs), and the Netherlands (4 programs).

(6) Jilin: There are 19 programs with a total enrollment of 2,090 students across 16 disciplines. Popular fields include Automotive Inspection and Maintenance Technology (3 programs) and Accounting (2 programs). The largest enrollments are in Automotive Inspection and Maintenance Technology (290 students) and Accounting (250 students). There are 10 Chinese partner institutions and 15 foreign partner institutions, with most foreign partners from South Korea (8 programs), Singapore (2 programs), and Canada (2 programs).

(7) Henan: There are 13 programs with a total enrollment of 1,210 students across 13 disciplines, including Animal Husbandry and Veterinary Medicine, Power System Automation Technology, E-commerce, International Trade, International Business, Accounting, Accounting Computerization, Computer Network Technology, Construction Engineering Technology, Information Technology, Applied Psychology, Horticulture Technology, and Crop Production Technology. Among them, Accounting Computerization and Construction Engineering Technology have relatively higher enrollments, each with 120 students. There are 6 Chinese partner institutions and 6 foreign partner institutions, with most foreign partners from the United Kingdom (6 programs), Australia (5 programs), and another 2 programs from Australia (note: possible duplication in original text).

(8) Heilongjiang: There are 5 programs with a total enrollment of 340 students across 5 disciplines, with no repeated establishment of the same discipline. The disciplines include High-speed Railway Engineering Technology, Construction Engineering Technology, Architectural Design, Financial Management and Practice, and Railway Transportation Operation Management. Among them, High-speed Railway Engineering Technology and Financial Management and Practice have relatively higher enrollments, each with 100 students. There are 3 Chinese partner institutions

and 3 foreign partner institutions, with most foreign partners from Russia (4 programs).

2.3 Western Region

(1) Sichuan: There are 35 programs with a total enrollment of 3,590 students across 27 disciplines. Popular fields include Construction Engineering Technology (4 programs) and Logistics Management (3 programs). The largest enrollments are in Construction Engineering Technology (490 students), Construction Cost (400 students), Logistics Management (200 students), and Business Management (200 students). There are 17 Chinese partner institutions and 29 foreign partner institutions, with most foreign partners from Australia (10 programs), the United Kingdom (8 programs), and the United States (5 programs).

(2) Chongqing: There are 22 programs with a total enrollment of 1,440 students across 19 disciplines. Popular fields include Accounting (3 programs), Nursing (2 programs), and Software Technology (2 programs). The largest enrollments are in Nursing (150 students), Accounting (130 students), Marine Technology (120 students), and Marine Engineering Technology (120 students). There are 12 Chinese partner institutions and 15 foreign partner institutions, with most foreign partners from Australia (9 programs) and Canada (7 programs).

(3) Guizhou: There are 14 programs with a total enrollment of 1,200 students across 9 disciplines. Popular fields include Accounting (2 programs), Finance and Insurance (2 programs), Hotel Management (2 programs), Marketing (2 programs), and Logistics Management (2 programs). The disciplines with relatively higher enrollments are Accounting, Finance and Insurance, Marketing, and Logistics Management, each with 200 students. There are 5 Chinese partner institutions and 7 foreign partner institutions, with most foreign partners from Canada (6 programs) and the United States (4 programs).

(4) Guangxi: There are 13 programs with a total enrollment of 1,155 students across 12 disciplines. Popular fields include Construction Engineering Technology (2 programs). The disciplines with relatively higher enrollments are Construction Engineering Technology (300 students) and Hotel and Tourism Operation Management (135 students). There are 6 Chinese partner institutions and 8 foreign partner institutions, with most foreign partners from Canada (4 programs), France (3 programs), and the United Kingdom (3 programs).

(5) Yunnan: There are 13 programs with a total enrollment of 900 students across 13 disciplines, with no repeated establishment of the same discipline. The disciplines include Electrical Automation Technology, Environmental Monitoring and Governance Technology, Accounting, Mechatronics Technology, Mechanical Manufacturing and Automation, Building Materials Engineering Technology, Economic Management, Rehabilitation Therapy Technology, Culinary Arts and Nutrition, Marketing, Leisure Services and Management, Applied Thai Language, and Intelligent Transportation Technology Application. The disciplines with relatively higher enrollments are Electrical Automation Technology, Mechanical Manufacturing and Automation, Building Materials Engineering Technology, Applied Thai Language, and Intelligent Transportation Technology Application, each with 100 students. There are 5 Chinese partner institutions and 8 foreign partner institutions, with most foreign partners from Canada (6 programs), Germany (2 programs), and Russia (2 programs).

(6) Shaanxi: There are 11 programs with a total enrollment of 1,140 students across 11 disciplines, with no repeated establishment of the same discipline. The disciplines include Power Plant Thermal Power Devices, Electrical Engineering, Business Management, Industrial Engineering, International Business, Computer Network Technology, Computer Application Technology, Tourism Management, Automotive Inspection and Maintenance Technology, Automotive Marketing and Service, and Software Technology. The disciplines with higher enrollments are Business

Management, Industrial Engineering, and Computer Network Technology, each with 150 students. There are 6 Chinese partner institutions and 6 foreign partner institutions, with most foreign partners from Australia (4 programs) and Canada (3 programs).

(7) Xinjiang: There are 10 programs with a total enrollment of 520 students across 9 disciplines. The only field with more than one program is Hotel Management (2 programs). The disciplines with relatively higher enrollments are Accounting (150 students) and Hotel Management (80 students). There are 4 Chinese partner institutions and 4 foreign partner institutions, with most foreign partners from Singapore (4 programs) and Malaysia (4 programs).

(8) Inner Mongolia: Excluding 3 discontinued or suspended programs, there are 9 programs with a total enrollment of 590 students across 7 disciplines, including Electrical Automation Technology, Nursing, Accounting, Road and Bridge Engineering Technology, Art Education, Preschool Education, and Music Education. Popular fields include Accounting (2 programs) and Preschool Education (2 programs), which also have relatively higher enrollments, with 150 and 180 students respectively. There are 4 Chinese partner institutions and 5 foreign partner institutions, with most foreign partners from Belarus (6 programs) and the United Kingdom (2 programs).

(9) Gansu: There is 1 program with an enrollment of 100 students in Accounting. The Chinese partner institution is Lanzhou Petrochemical College of Vocational Technology, and the foreign partner institution is Holland College in Canada (1 program).

(10) Qinghai: There is 1 program with an enrollment of 50 students in Nursing. The Chinese partner institution is Qinghai Health Vocational and Technical College, and the foreign partner institution is Bow Valley College in Canada (1 program).

(11) Ningxia, Tibet: Currently, there are no Sino-foreign cooperative education programs in higher vocational education established.

3. Analysis and Discussion

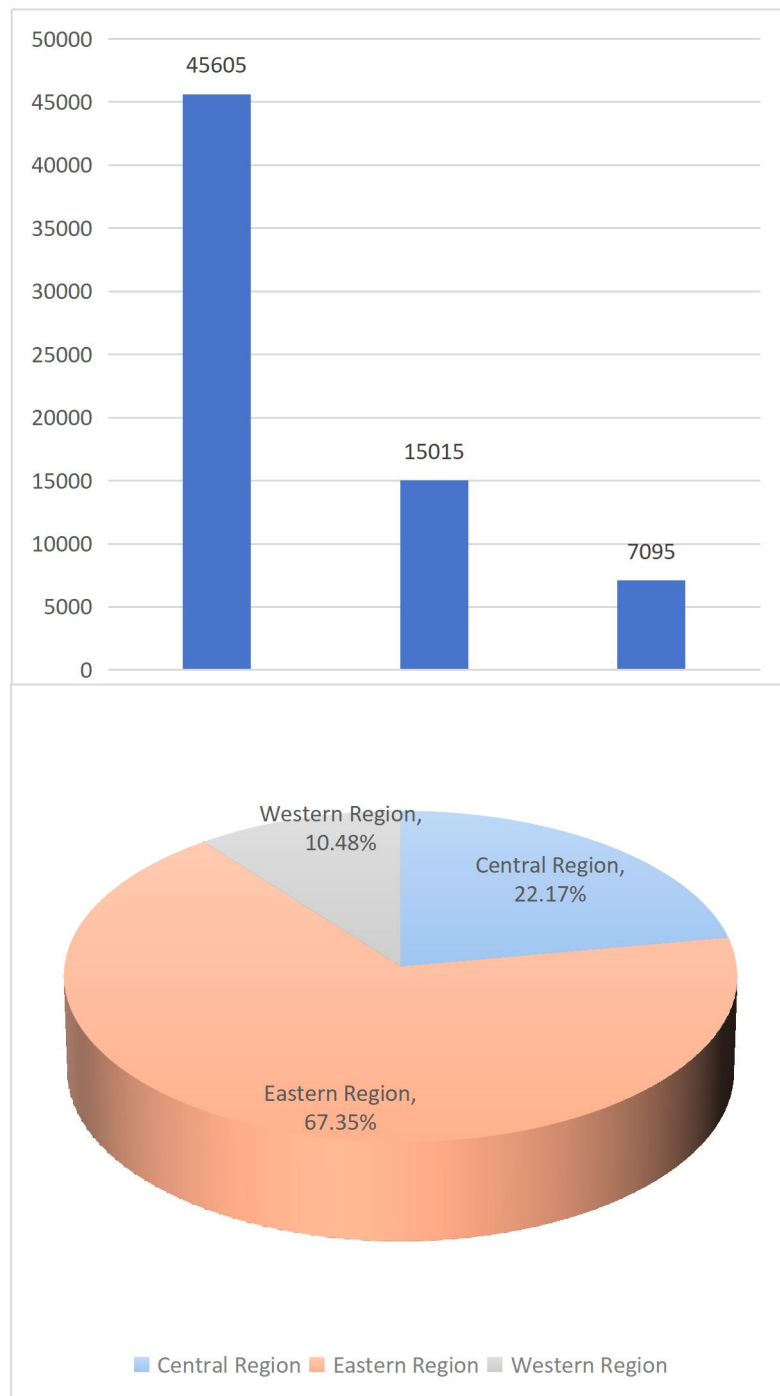
3.1 Program Enrollment Numbers

Table 2. Distribution of Program Enrollment Numbers

Serial No.	Region	Enrollment Numbers	Serial No.	Region	Enrollment Numbers
1	Jiangsu	10,067	17	Guizhou	1,210
2	Zhejiang	7,006	18	Guangxi	1,200
3	Shandong	5,705	19	Henan	1,155
4	Hebei	5,655	20	Yunnan	1,140
5	Shanghai	4,875	21	Shaanxi	900
6	Hubei	4,410	22	Xinjiang	700
7	Guangdong	3,590	23	Inner Mongolia	590
8	Sichuan	3,350	24	Fujian	530
9	Hunan	2,960	25	Tianjin	520
10	Beijing	2,165	26	Heilongjiang	340
11	Anhui	2,090	27	Liaoning	100
12	Shanxi	1,570	28	Gansu	92
13	Chongqing	1,490	29	Qinghai	50
14	Jiangxi	1,440	30	Ningxia	0
15	Hainan	1,410	31	Tibet	0
16	Jilin	1,405	32	Total	67,715

By analyzing the total enrollment numbers across various regions (as shown in Table 2), the total number of students enrolled in higher vocational education programs is 67,715. Jiangsu has the largest total enrollment, with as many as 10,067 students, accounting for 14.88% of the total. Regions with an enrollment of more than 4,000 students include Jiangsu, Zhejiang, Guangdong, Shandong, Hebei, and Shanghai. The total enrollment in these six regions reaches 37,718 students, accounting for more than half of the national total enrollment, with a proportion of 55.74%. Regions with an enrollment of fewer than 500 students include Heilongjiang, Gansu, Liaoning, and Qinghai.

Figure 2. Regional Distribution of Program Enrollment Numbers



From the analysis of the regional enrollment scale (as shown in Figure 2), it shows a decreasing trend from the eastern region to the western region. Provinces with a higher degree of export-oriented economy have higher demands for the international quality of talents, resulting in a higher degree of openness in higher vocational

colleges, and more active international exchanges and cooperation. It is evident that the development scale of Sino-foreign cooperative education in higher vocational education is closely related to the development and demands of the regional economy. (Mo Yuwan, Mo Chunlei, 2019: 14) The total enrollment in cooperative education programs in the eastern region reaches 45,605 students, accounting for 67.35% of the national total. The total enrollment in cooperative education programs in the central region is 15,015 students, accounting for 22.17% of the national total, slightly higher than that of the western region but far lower than that of the eastern region. The total enrollment in programs in the western region is only 7,095 students, accounting for 10.48% of the national total, which is only 1/6 of that in the eastern region. The spatial distribution of the scale of Sino-foreign cooperative education in higher education is significantly different. (Li Canmei, Feng Zunyong, 2020: 117) Policies encourage the development of Sino-foreign cooperative education in the western and remote impoverished regions of China. (Yang Lijun, Tang Meiling, 2012: 14) To promote the development of cooperative education in the western region, Li Yang (2016: 23) proposed "cooperative education between the western region and neighboring countries." The western region cooperates with neighboring countries in cooperative education. For example, Jilin is close to South Korea, and the cooperation projects between them are relatively more than those with other countries or regions. Among the 19 projects established in Jilin, 8 of them originate from South Korea. Liu Qi (2018: 28) pointed out that the enrollment scope can be expanded, especially for projects in the western and frontier provinces, which should extend their enrollment to economically developed regions such as Guangdong, Jiangsu, and Zhejiang.

3.2 Disciplines Offered in Program Enrollment

Table 3. Scale of Disciplines Offered in Program Enrollment

Serial No.	Bottom 30 Disciplines	Number of Students	Top 30 Disciplines	Number of Students
1	Law	20	Accounting	6,170
2	Business Administration	20	Computer Application	5,180

			Technology	
3	Mechanical and Electronic Engineering	20	Tourism Management	2,750
4	Embedded Technology and Application	20	International Business	2,525
5	Business Information Technology	25	Marketing	2,385
6	Information Technology Management	28	Hotel Management	2,347
7	Security and Safety	30	Construction Engineering Technology	2,285
8	Performing Arts	30	Nursing	2,230
9	Veterinary Medicine	30	Mechatronics Technology	1,889
10	Aviation Services	30	E-commerce	1,670
11	Environmental Engineering Technology	30	Logistics Management	1,610
12	Biotechnology and Application	30	Preschool Education	1,586
13	Chartered Financial Analyst	30	Software Technology	1,410
14	Dance Performance	30	International Economics and Trade	1,280
15	Film and Television Animation Production	30	Computer Network Technology	1,270
16	Oil and Gas Extraction Technology	30	Business Management	1,220
17	Multimedia Design	35	Automotive Inspection and Maintenance Technology	1,200
18	Customs Declaration and International Freight	40	Mechanical Manufacturing and Automation	1,150
19	Urban Rail Transit Vehicle Technology	40	Business Management	1,070
20	Optoelectronic Manufacturing and Application Technology	40	Game Software	1,060
21	Accounting and Auditing	40	Art and Design	890
22	Computer-Aided Design and Manufacturing	40	Flight Attendant	880
23	Oral Medicine Technology	40	Electrical Automation Technology	840
24	Art Education	40	Financial Management and Practice	760

25	Agricultural Machinery Application Technology	40	Business English	645
26	Graphic and Image Production	40	Computer Information Management	600
27	Secretary	40	Mechanical Design and Manufacturing	580
28	Music Education	40	Applied Electronic Technology	575
29	Applied Spanish	40	International Trade Practice	575
30	Embedded System Engineering	45	Aircraft Mechatronics Equipment Maintenance	500
31	Total	993	Total	49,132

An analysis of enrollment scale (as shown in Table 3) reveals that among the 228 disciplines with enrollment programs nationwide, there are 30 disciplines with a total enrollment of no more than 50 students. Five disciplines, namely Law, Business Administration, Mechanical and Electronic Engineering, Embedded Technology and Application, Business Information Technology, and Information Technology Management, each have a total enrollment of fewer than 30 students. The combined enrollment of the bottom 30 disciplines in terms of student numbers is 993, which is less than the total enrollment of any single discipline among the top 20. There are as many as 96 disciplines with an enrollment scale of fewer than 100 students. Kang Hui et al. (2020: 37) argue that the current overall enrollment scale of Sino-foreign cooperative education programs is relatively small. In contrast, there are only two disciplines with an enrollment exceeding 5,000 students, namely Accounting and Computer Application Technology. Additionally, six disciplines, including Tourism Management, International Business, Marketing, Hotel Management, Construction Engineering Technology, and Nursing, each have a total enrollment of over 2,000 students. In total, there are 20 disciplines with an enrollment of over 1,000 students.

Table 4. Number of Programs Established for the Same Discipline (10 or More Programs)

Serial No.	Discipline	Number of Programs	Serial No.	Discipline	Number of Programs
1	Accounting	77	12	Preschool Education	21
2	Tourism	38	13	Software Technology	20

	Management				
3	International Business	33	14	Automotive Inspection and Maintenance Technology	19
4	Marketing	33	15	Computer Network Technology	17
5	Hotel Management	32	16	Mechanical Manufacturing and Automation	17
6	Mechatronics Technology	30	17	International Economics and Trade	16
7	Construction Engineering Technology	29	18	Business Administration	15
8	Nursing	28	19	Art and Design	14
9	Logistics Management	25	20	Business Management	12
10	E-commerce	22	21	Electrical Automation Technology	12
11	Computer Application Technology	21	22	Total	531

Generally speaking, disciplines with larger enrollment numbers tend to have a corresponding increase in the number of similar programs established. Nationwide (as illustrated in Table 4), there are 77 programs established for the Accounting discipline, 38 for Tourism Management, 33 for International Business, and another 33 for Marketing. Among these 21 disciplines with multiple program offerings, a total of 531 similar programs have been established. Scholars such as Tao Shuzhong and Shen Peiqiong (2008: 81), Wang Jinxia (2013: 173), Yuan Jun (2015: 92), and Wang Linli (2016: 77) have all raised the issue of "convergence in discipline offerings," noting that low-level, repetitive establishment of educational programs exists to a certain extent, which could impact graduates' employment prospects. Many characteristic disciplines in schools fail to integrate with high-quality foreign educational resources (Jin Jihua, Han Lingeng, 2014: 49). Consequently, the original intention of establishing Sino-foreign cooperative programs has not been realized. Ding Ningqun (2019: 120) believes that discipline offerings should strengthen the

integration of localization and internationalization in domestic cooperative education, highlighting local characteristics, meeting students' diverse needs, and understanding some of the currently in-demand disciplines domestically. National policies encourage the establishment of disciplines that are urgently needed for social development, thereby drawing on advanced concepts and educational experiences. Through investigation and analysis, it was found that in nine provinces and municipalities, namely Tianjin, Fujian, Henan, Shaanxi, Heilongjiang, Liaoning, Yunnan, Gansu, and Qinghai, there is no duplication in the disciplines offered. Chinese universities can combine their own disciplinary strengths with those of their foreign counterparts to avoid redundant construction within the same province (or municipality) when establishing cooperative programs.

3.3 Chinese and Foreign Partner Universities

Table 5. Distribution of Foreign and Chinese Partner Universities

Serial No.	Region	Number of Foreign Partner Universities	Number of Chinese Partner Universities	Serial No.	Region	Number of Foreign Partner Universities	Number of Chinese Partner Universities
1	Jiangsu	93	66	17	Guangxi	8	6
2	Zhejiang	58	33	18	Yunnan	8	5
3	Shandong	53	40	19	Guizhou	7	5
4	Shanghai	43	30	20	Henan	6	6
5	Hubei	37	30	21	Shaanxi	6	6
6	Hebei	30	22	22	Inner Mongolia	5	4
7	Guangdong	30	28	23	Tianjin	5	5
8	Sichuan	29	17	24	Xinjiang	4	4
9	Jiangxi	29	8	25	Fujian	3	3
10	Hunan	16	15	26	Heilongjiang	3	3
11	Beijing	15	12	27	Liaoning	2	2
12	Chongqing	15	12	28	Gansu	1	1
13	Jilin	15	10	29	Qinghai	1	1
14	Anhui	14	12	30	Ningxia	0	0
15	Shanxi	11	12	31	Tibet	0	0

16	Hainan	9	8	32	Total	556	406
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Through a comparative analysis of the number of foreign and Chinese partner universities (as shown in Table 5), Jiangsu, Zhejiang, and Shandong rank among the top three. Jiangsu has 93 foreign partner universities and 66 Chinese partner universities. Zhejiang has 58 foreign partner universities and 33 Chinese partner universities, while Shandong has 53 foreign partner universities and 40 Chinese partner universities. It can be observed that the total number of foreign partner universities is 556, exceeding the 406 Chinese partner universities. In every province (municipality, autonomous region), the number of foreign partner universities surpasses that of Chinese partner universities. This is due to Chinese universities seeking cooperative programs with multiple foreign institutions.

Table 6. Number of Programs by Partner Country or Region

Serial No.	Partner Country or Region	Number of Programs	Serial No.	Partner Country or Region	Number of Programs
1	Australia	202	15	Netherlands	10
2	Canada	141	16	Belarus	7
3	United States	121	17	Ukraine	5
4	United Kingdom	116	18	Italy	5
5	South Korea	81	19	Poland	4
6	Germany	46	20	Denmark	3
7	New Zealand	29	21	Hungary	3
8	Russia	22	22	Switzerland	2
9	Japan	20	23	Spain	2
10	Singapore	19	24	Austria	1
11	Ireland	13	25	Finland	1
12	France	13	26	Thailand	1
13	Malaysia	13	27	Hong Kong	1
14	Taiwan	11	28	India	1

Among the 893 vocational education programs, cooperative programs with foreign partner universities span a total of 28 countries or regions. As indicated in Table 6, the combined number of cooperative programs with Australia, Canada, the United States, and the United Kingdom exceeds 100 each, totaling 580 programs, which accounts for 64.95% of all programs, nearly two-thirds. Foreign partner universities are

predominantly from developed countries. Sino-foreign cooperative education has become an important overseas education market for developed countries (Zhou Hong, 2020: 103). Cooperative programs with universities from developing countries such as Belarus and Ukraine are also gradually developing. Among the analyzed programs, there are 3 cooperative programs each with Denmark and Hungary, 2 each with Switzerland and Spain, and only 1 each with Austria, Finland, Thailand, Hong Kong, and India.

4.Conclusion

Through specific data analysis, Sino-foreign cooperative education programs are predominantly concentrated in the economically and educationally developed eastern regions, with a decreasing trend in total enrollment from the eastern to the western regions. On one hand, the state encourages the development of Sino-foreign cooperative education in the western and remote impoverished regions. The establishment of Sino-foreign cooperative programs should comply with legal norms and operate within the scope permitted by policies. This will facilitate the cultivation of internationalized talents, thereby promoting local social and economic development. On the other hand, in regions where Sino-foreign cooperative programs have achieved certain development, new cooperative disciplines can be explored, and disciplines with promising employment market prospects can be established to further expand students' development pathways. Consideration can be given to combining degree education with non-degree education. Through Sino-foreign cooperative education, advanced and successful experiences from foreign institutions can be learned and applied. With an open mindset and bold exploration, active efforts can be made to seek comprehensive cooperation with more countries such as Europe, the United States, Japan, and Russia, so as to foster a diversified development pattern for the overall Sino-foreign cooperative programs.

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