

Exploring The Nature Of Industry-College Partnerships In China: Insights From The “China Model”

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ABSTRACT

This paper studies the industry-college partnerships of the college and industry partners in four cases from Shandong Vocational College of Light Industry. Based on in-depth interviews, surveys and literature research, this paper explores the nature of industry-college partnerships from four aspects: course system construction, teaching process management, teacher management and practical teaching management, and developed a “China model” of industry-college partnerships.

Key Words: Industry-college partnerships, Nature, China modal

Introduction

Over the past two decades, China has experienced unprecedented economic growth, especially in the booming manufacturing sector. In response to the needs of this economic expansion, China's higher vocational colleges have carried out continuous reforms to improve the quality of talent training based on industry-college partnerships. Therefore, these two decades are also a period of remarkable progress in China's vocational education.

In China's vocational education system, which is led by the government and guided by national policies, higher vocational colleges have carried out extensive partnerships with industry partners and accumulated a lot of practical experience in industry-college partnerships. This paper discusses the intrinsic nature of China's industry-college partnerships, focusing on four cases from Shandong Vocational College of Light Industry for detailed analysis. Through this expedition, the paper aims to reveal the nature of these partnerships and elucidate their impact on talent training and economic growth in China.

Methodology 1 Case study

The case study uses qualitative research procedures to analyze the data and uses thematic analysis to guide the case study analysis (Merriam, 1998). Multiple case study method (see Table 1) is used in this paper, by analyzing the differences and finding out the commonalities, to provide reference for the research. De Vaus (2001) reinforces the point that the related factors of each case are analyzed in greater detail by utilizing descriptive analysis. In this paper, each of the four cases is analyzed to clarify cases as a holistic phenomenon. By describing each case in detail, analyze and compare their industry-college partnerships, to reveal the nature of industry-college partnerships.

Table 1: Partners of industry-college partnerships and cooperative majors

Partners	Department partner	Industry partner	Cooperative major
DP1 & IP1	Department of information engineering	Bestlink Technology Co., LTD	Modern communication technology
DP2 & IP2	Department of textile engineering	Lutai Textile Co., Ltd	Textile design
DP3 & IP3	Department of business administration	Tianjin Lianhang General Aviation Co.,Ltd.	Air crew
DP4 & IP4	International institute fashion	Shanghai Saite Silk Import and Export Co., LTD	Fashion and costume design

2 In-Depth Interview

In-depth interview, also known as semi-structured depth interviews in academia, is a common method in qualitative research and an important source of evidence for case studies (Hakim, 1987; Arksey & Knight, 1999; Wengraf, 2001). Eight respondents participated in the interviews from both department partners and industry partners. In addition, six respondents from the college and industry partners participated in the survey. These responders have been identified for this study due to their prominence and reputation in industry-college partnerships. Table 2 shows the background characteristics of respondents. Table 1: The background characteristics of respondents

Respondents From enterprise (Pseudonym)	Position	Age (years)	Gender
EM1	Enterprise manager	45	Male
EM2	Enterprise manager	38	Male
EM3	Enterprise master	36	Female
OS1	Office staff	27	Female
MP1	Manager of industry-college partnerships	40	Male
MP2	Manager of industry-college partnerships	43	Female
SM1	Senior manager	52	Male
Respondents From college (Pseudonym)	Position	Age (years)	Gender
TA1	Teaching Administrator	42	Male
TA2	Teaching Administrator	39	Male
T1	Teacher	41	Female
T2	Teacher	37	Female
MP1	Manager of industry-college partnerships	41	Male
MP2	Manager of industry-college partnerships	37	Female
SM1	Senior manager	50	Female

Nature of Industry-College Partnership in China 1 The Partnership in Course System Construction

Guoqing Xu (2016) believes that the construction of modern vocational education should be carried out closely in the process of talent training, among which the most critical elements are course, teaching, and teachers. And the course is the primary factor. Course is the foundation of education, and course construction is a very complicated process. In particular, the course construction of vocational education highlights the ability-based, facing the constant change of external requirements. Therefore, higher vocational colleges should cooperate deeply with industry partners in course system construction, master the requirements of enterprises and industries, and make timely adjustments, to develop a course system that meets the requirements of industry-college partnerships and lay a solid foundation for the success of industry-college partnerships.

1.1 Course design

The principle of course design in vocational education is to select and organize course content according to the task of the vocational post, which is completely different from traditional professional education. Knowledge in the course is selected and organized in a way that is relevant to the work tasks of enterprises, as the aim is to prepare students for the job position. Due to technological development and industrial upgrading, the job demands of enterprises are constantly changing. Without an in-depth analysis of these changes, the courses developed may fall behind the actual demands. Therefore, course construction of higher vocational college is a complex process, which requires continuous close partnerships with industry partners. In the course development, the course development team should first investigate the corresponding job group of the major, understand the job responsibilities, and then conduct an effective analysis of the job tasks according to these

job responsibilities. Finally, appropriate carriers are selected according to typical work tasks, and learning tasks or learning situations are designed so that students can learn theoretical knowledge in the process of completing specific work.

In case study one, DP1 and IP1 develop the course together to better suit students to the needs of the company. In the selection of teaching content, they fully consider the post needs of the company, and choose the course content according to the knowledge and skills required by the post. They also incorporate the real working processes into the course teaching. At the same time, the course content is set according to professional standards, which is conducive to students passing the skills certificate examination. A master from the enterprise said:

Firstly, our course teaching team conducted an enterprise survey. Through the discussion with enterprise experts and questionnaire survey, they learned the opinions and suggestions of enterprises on DP1 teaching. Then according to the opinions of enterprises to adjust the course teaching design, increase the practice period and content. ... The course content is connected to Huawei Vocational certification and 1+X certification (IP1, master, 2022).

In everyday situations, tasks are intertwined, like the complex roots of a tree. The purpose of task analysis is to clean up a clear internal structure. Typical task analysis should grasp the valuable and important tasks in the task system, which includes rich teaching content, and has strong independence.

In the process of task analysis, the opinions of enterprise experts should be paid full attention to. There are job experts in every position in the company, who have worked in a job or a nearby job for many years and have a deep understanding of the job content. Their understanding of job tasks and the vocational ability required to perform them is irreplaceable by college teachers. The participation of job experts in the course design can ensure that the course is really close to the requirements of vocational posts.

Moreover, the analysis of vocational ability is the content that cannot be ignored in the course design. Vocational ability is the ability of an individual to be competent for work tasks, which carries the elements of work tasks. On the other hand, it is also the purpose of implementing the course content, that is, cultivating the ability of individuals to be competent for work tasks. Guoqing Xu (2016) believes that the course content cannot be directly analyzed from the work tasks. If there is no vocational ability behind the work tasks, it will be difficult for teachers to grasp the knowledge and skills needed to be competent for a certain work task. The task describes what is to be done, not how far and well the task is to be done.

Vocational ability is a kind of ability to do things, including professional ability and social ability, such as adaptability, teamwork ability, ability to analyze and solve problems, innovation ability, etc. In the analysis of vocational ability, enterprise experts have an advantage over college teachers, who have a better understanding of these ability requirements.

Students' professional skills advance and progress step by step with the classification of individual, special, and comprehensive practical training of practical teaching, and realize the integration of the learning scene and working scene through environmental professionalization. The teacher of DP3 explained this:

The course team first visited and investigated the knowledge, quality, and ability requirements of enterprise positions for aircrew majors, and then analyzed typical work tasks to determine the field of action. Thirdly, the field of action is transformed into the field of learning and the content of students' learning is determined. The aim is to train students' quality, knowledge, and ability... The whole course system focuses on the training of professional quality (DP3, administrator,2022).

1.2 Online course construction

An important impact of the development of modern computer network technology on course construction in higher vocational colleges is constructing online course. That is, online course construction allows the course developed or piloted by any college to be rapidly published online and become a wealth of information shared by students and society.

Wenli Li (2011) thinks that the goal of online course construction in higher vocational colleges is consistent with the goal of training in higher vocational colleges. In the context of massification and internationalization of higher education, strengthening course reform and online course construction, through building a new course system, developing and constructing course clusters, and updating the teaching content could overall improve the quality of professional talent training and social service capacity of China's higher vocational education, benefit ten million students enrolled in higher vocational education across the country. It can also provide the on-the-job personnel in the relevant industrial fields with the opportunity to improve and update their skills and satisfy their personal diversified learning needs service.

In case study two, by combining "Internet +" technology with professional courses, both sides of the industry-college partnerships also set up a course development team and built a course website and network resource library, including courseware, lesson plans, videos, cases, exercises, sample libraries, excellent works display, etc. A teacher from DP2 described it this way:

Under the background of "Internet +", online courses are playing an increasingly important role. Through the online course platform, students can directly browse or download teaching resources for self-study, tests, or discussion. The online course platform can record students' online learning situations in real time. Teachers can view each student's learning through the platform and conduct online tutoring. (DP2, teacher,2022)

In case study four, DP4 has also developed a library of teaching resources, including professional teaching resources, independent learning resources, industry resources, etc. Make full use of the network platform to realize the sharing of talent resources, practical training resources, course resources, and information resources. At present, the courses such as "Women's Structural Design", "Three-dimensional Tailoring", "Garment Production Technology", "Intelligent fashion design" and so on have been developed online courses, which are convenient for students to learn online.

1.3 Textbook writing

Textbook is the main carrier to realize the purpose of education. Juli Zhao & Yanfang Wang (2003) thinks that the writing of higher vocational textbook is the key to reflect the characteristics of higher vocational education. In the past two decades, China's higher vocational education has developed rapidly, but the writing of higher vocational textbook lags behind the development of higher vocational education, in particular, there are not many textbooks suitable for industry-college partnerships, so that higher vocational education mostly uses or draws lessons from undergraduate textbook, which mostly focus on theory but are weak in practice and are not suitable for higher vocational education. Therefore, to realize the goal of talent training in higher vocational education, the textbook writing of higher vocational education is very important. At present, most of our higher vocational education courses adopt the action-oriented vocational education course model, that is, the course teaching model with ability as the goal, students as the main body, teachers as the lead, and projects and real work tasks or products as the carrier (Aixiang Chen,2022). Therefore, the writing of supporting textbooks should be based on the requirements of vocational posts for knowledge, ability and quality, guided by vocational activities, with projects and tasks as the carrier, reflecting the characteristics of higher vocational education and adapting to the needs of higher vocational courses. Writing high-level textbooks based on industry-college partnerships is the key to realizing the teaching goal of higher vocational courses effectively and train high quality technical and skilled personnel.

In all four cases of this study, textbooks based on industry-college partnerships were developed. In case study one, corporate experts were invited to participate in the write of the textbook. DP1 and IP1 have jointly developed textbooks such as "Routing and Switching Technology", "LTE Mobile Communication Technology", "Fundamentals of Computer Networks" and "Wireless Network Planning and Optimization", which are specially used for industry-college partnership classes. In case study two, DP2 and IP2 have co-authored textbooks, such as "Fabric Structure Design and Application", "Weaving Technology", "Industrial Textiles", etc. In case study three and case study four, DP3 and IP3 jointly wrote the textbook "Civil Aviation Application English", while DP4 and IP4 cooperated in writing the textbook "Men's Style, Patterns and Techniques".

2 The Partnership in Teaching Process Management

The process is a bilateral activity process composed of teachers' teaching and students' learning according to a certain teaching purpose. This process is composed of teachers, students, teaching content, and means. Dan Cui (2017) considers higher vocational colleges generally adopted project-based teaching based on the integration of production and education, and its process management is different from the traditional teacher-oriented process management, but student-oriented process management. The teaching process pays more attention to the initiative and participation of students.

Teaching process management is very important in industry-college partnerships, which directly affects the educational quality of industry-college partnerships. Guoqing Xu (2016) points out that the key to the quality of education is the quality of classroom teaching. Through classroom teaching, the content of the course can be mastered by students and their abilities can be developed.

2.1 Teaching mode design

The selection and design of teaching models are critical to the quality of the educational process and student learning outcomes. Higher vocational teaching models are usually closely related to specific vocational fields and industry needs and aim to prepare students with practical vocational skills and employability that are responsive to market needs. Common higher vocational teaching models include practice-oriented teaching models, task-driven teaching models, integrated teaching models and so on.

In the process of classroom teaching, case study one adopts the teaching model of "theory + practice", and highlights the teaching characteristics of "learning by doing and teaching by doing" in vocational education. Students can learn by doing and by practicing. At the same time, they introduce real cases of enterprises to achieve "zero distance" between "learning" in class and "using" in posts.

In the teaching process, the practice is oriented and the "task-driven" teaching mode is adopted by partners of case study two. Based on the actual working process needs of textile design, a typical task is extracted. According to the task, students will study autonomously and collaboratively in groups to explore the methods and approaches to complete the task. Teachers participate in students' learning activities, grasp the learning progress, find problems, timely guidance. Teachers and students conduct hierarchical evaluation (self-evaluation, mutual evaluation, and comment) on the completion of tasks in various forms. Students reflect on the learning process and summarize the knowledge and skills they have learned based on communication.

In case study three, DP3 and IP3 cooperate to restructure the teaching content. The teaching content is based on the practical needs of students and the occupational needs of cabin crew positions, takes the actual process and norms of cabin service work of civil aviation attendants as the key line, combines the standard of 1+X flight attendant vocational skill level and the standard of cabin service competition of National Flight Attendant Skills Competition, and finally builds a case-guided, task-driven and online platform based online and offline mixed teaching mode. Students learn theoretical knowledge and extension online and conduct skill training and consolidation offline.

In case study four, DP4 joint industry and enterprise experts jointly carry out the reform of professional teaching and build the training mode of the "industry-college partnerships, virtual integration reality, and ability to go forward" with international competitiveness. According to the learning objectives of the course, result-oriented, the teaching process takes fashion and costume design products as the learning carrier and is constructed according to the real working process of the enterprise.

2.2 Teaching Method Design

The project teaching method is the dominant teaching method in China's vocational education at present. The project teaching method first appeared in Europe in the 17th and 18th centuries. Later, this teaching method was spread to the United States. Based on Dewey's pragmatic philosophy and activity course theory, Kilpatrick formed the systematic theory of project teaching. The application and research of project teaching methods in China began after 2001.

Wenming Yang (2010) believes that project teaching is a teaching method that breaks the boundary between subject knowledge, takes the topic as the teaching unit, and enables students to master knowledge and skills with the help of actions around the topic. It can be seen that project teaching is a teaching mode that relies on the project implementation process to develop the teaching process. Project implementation is usually carried out in the process of identifying the project, completing the project according to the steps, and evaluating the project, so the development of the project teaching process follows this logic.

A teacher from DP2 had this to say:

The whole teaching process is a complete behavior model including access to information, making plans, design schemes, organizing and implementation, quality control, assessment and evaluation, and so on. Specific teaching methods involve case teaching, field teaching, project-driven teaching, role-playing, question leading, field debate, simulation teaching, self-study inquiry, inter-group competition, and other teaching methods. Either method can be used independently or mixed flexibly. The most important thing is to reflect competency-based, that is, in action-oriented teaching, all learning activities of students are aimed at improving ability. (DP2, teacher,2022) In addition to the project teaching method, case teaching, task teaching, role-playing, situational teaching, simulation teaching and other methods are also used in the teaching process. Inspiratory, inquiry, discussion, participation and other teaching methods are used, and students' independent learning, cooperative learning and teacher-led teaching are combined to optimize the teaching process and improve learning efficiency.

Regarding teaching methods, this is how it is described by the administrator from DP3:

Simulation teaching is a common teaching method in the teaching process of aircrew majors. Simulated teaching is learning knowledge, skills, and abilities required for a profession in an artificial situation or environment. Simulation training gives a sense of being there, and more importantly provides a lot of opportunity for repetition and the possibility of process evaluation at any time, at a lower cost... In addition, independent learning is advocated. Under the educational information environment, online platform resources are fully utilized to enable students to independently preview before class, practice in class, and review after class, to give full play to students' subjective initiative in learning and realize flipped classroom. (DP3, administrator,2022)

2.3 Supervision and evaluation

In traditional education, the evaluation of teaching quality only attaches importance to the evaluation of colleges or teachers. However, in the industry-college partnership training mode, it is the goal of higher vocational colleges to improve the matching degree between the quality of talent training and the needs of enterprises, so enterprises should participate in the evaluation of teaching to establish a multiple evaluation system based on industry-college partnerships.

Vocational education focuses on the process of education, the evaluation system should also adapt to it, and pay attention to the evaluation of the quality of the teaching process. The content of evaluation is the supervision, inspection, and evaluation of the whole teaching process, especially the evaluation of the practice teaching process and practice stage.

In case study two, DP2 adopts the result-oriented assessment and evaluation method and the comprehensive evaluation method combining process evaluation and result evaluation. Set multiple assessment tasks in different assessment methods. Each assessment task should be mapped to the course teaching objectives, and the sum of assessment points supports all training specifications. The evaluation method should be consistent with the evaluation method in the teaching objectives of the course. It mainly aims at the application, analysis,

evaluation, creation, and other high-level teaching objectives. The evaluation can be carried out in the form of homework, work, products, and commodities that can reflect students' learning results.

DP2 also has a perfect teaching management mechanism and work diagnosis and improvement system to carry out professional teaching quality supervision and evaluation. An administrator from DP2 described it this way: In the daily teaching operation and management, DP2 adopts the methods of course tours, teaching evaluation, and learning evaluation to supervise and evaluate the teaching process... Given the practice teaching link, the establishment of a practice supervision system linked with the industry and enterprises, strict teaching discipline, strengthen the teaching organization function... DP2 regularly carries out open courses, demonstration courses, professional research, talent training program updates, and teaching resource construction, to strengthen the construction of quality standards and improve teaching quality. (DP2, teacher, 2022)

In case study four, DP4 has established a teaching quality diagnosis and improvement mechanism for colleges, institutions, and teaching departments, improved the professional teaching quality and monitoring management system, improved the construction of quality standards in classroom teaching, teaching evaluation, practice and training, graduation design, professional research, talent training program update, resources construction and other aspects. Through teaching implementation, process monitoring, quality evaluation, and continuous improvement, DP4 ensures the achievement of talent training standards. In the teaching process, supervision and evaluation are very important to ensure the quality of teaching. DP4 and IP4 have worked together to develop a system to regulate the process of talent training, and have received good results. (IP4, office staff, 2022)

The evaluation of students focuses on highlighting professional skills and examining students' comprehensive application abilities. Process assessment covers the whole process of the project task, including expertise, skills, and attitudes. For particularly strong practical learning tasks, it is necessary to combine the analysis of results, the application of knowledge, and the ability to deal with problems.

3 The Partnership in Teacher Management

Both course development and teaching implementation need to be completed by teachers, so teachers' ability level is extremely critical. Vocational education trains skilled talents, so it needs not only teachers who can impart theoretical knowledge but also teachers who can impart practical working ability. Philipp Grollmann and Felix Rauner (2007) believe that improving the quality of teachers is an important means to improve the quality of vocational education. Only when teachers have the skills can they impart them to their students.

3.1 Full-time teacher training

China's higher vocational colleges usually employ teachers first and train them later. The new teachers graduated from universities with bachelor's degrees or master's degrees and have rich theoretical knowledge, but lack practical ability. For new teachers, half a year of enterprise practice is arranged, and they can teach professional courses after obtaining vocational qualification certificates, which are the so-called "dual-quality" teachers. A vocational qualification certificate system is a kind of system designed to determine whether an individual can work in a certain professional field.

One of the basic requirements of vocational education courses is that the course content must be consistent with the actual work content of the position, and to do this, college teachers must always have close interaction with enterprise experts to learn about the work content and technological changes. Therefore, regular practical training is also carried out for teachers who have obtained double qualifications. The practical training of these teachers goes hand in hand with their teaching duties in colleges. Training is usually scheduled during the summer or winter vacation.

In case study one, DP1 has strict requirements on teachers, who must have a master's degree, obtain Huawei certification, and complete enterprise practice and training before teaching students. DP1 administrator from the department described it this way:

Every winter and summer vacation, we will arrange for teachers to come to IP1 for professional practice to get familiar with the production practices of the enterprise (DP1, administrator, 2022).

3.2 Part-time teacher training

The diversity of course content and teaching requirements determines the diversity of the structure of vocational education teachers. In addition to hiring teachers from universities, higher vocational colleges also hire experts or skill masters from enterprises to serve as full-time or part-time teachers to enrich the teaching staff and improve the practical ability of the teaching staff.

In case study one, IP1 dispatched several technical backbones as part-time teachers to undertake the teaching tasks of professional courses in DP1. IP1 stipulates that only mentors with intermediate or above Huawei certification can serve as part-time teachers. Part-time teachers also participate in DP1 course development, talent training program formulation and modification, teaching quality evaluation, etc.

In case study three, IP3 employs senior managers, business backbones, and experts from the industry as part-time teachers, who are required to have rich flight experience, student management experience, and familiarity with the rules of vocational education. One master from IP3 said like this:

Only those who meet the conditions can teach students in industry-college partnership classes. Part-time teachers are required to undertake professional teaching and practical guidance tasks at least 50%. (IP3, master,2022)

4 The Partnership in Practical Teaching Management

The practical teaching in higher vocational colleges pays attention to training practical ability and zero distance connection with the actual post. Closely integrating practical teaching with the needs of enterprises and the standard requirements of vocational qualification certificates can improve the quality of teaching and the competitiveness of students in employment. Usually, higher vocational colleges and enterprises jointly build internship bases and manage the internship process.

4.1 Internship base construction

In all four of the cases in this study, the parties jointly constructed internship bases. In case study one, there is an ICT public training base in DP1, which is built in cooperation with IP1, with an investment of 700 million yuan. ICT public training base has a total equipment value of more than 10 million yuan and 360 workstations. IP1 enterprise project team also has an off-campus training base, with “data communication”, “three networks integration”, “network planning and network optimization”, “sensor network application development” and other training rooms for students to practice. ICT public training bases and off-campus training bases can meet 1000 students at the same time. In these training bases, students can learn while doing.

In case study two, DP2 and IP2 have cooperated in building a fully equipped and functional internship base, including a “factory in school”, “textile materials laboratory”, “fabric proofing laboratory”, “CAD laboratory”, and “new product research and development center”. With the Shandong province's first-class advanced instruments and equipment, the internship base can meet the requirements of “teaching and doing”.

The Aviation Service Training Center is an internship base jointly built by DP3 and IP3, which is used for practical teaching of students in aircrew majors. It invested a total of 100,000 yuan, including the simulation terminal and the simulation cabin of Airbus 320 models, which can satisfy students' training during college. In case study four, “One garden and four centers” built by DP4 and IP4 can meet the requirements of students' practical teaching. At present, there are 780 sets of practice equipment and 580 training stations, including an advanced 3D body scanner, integrated clothing design training platform, etc. This is an exemplary public training platform with advanced equipment, advanced management, and open sharing. This training platform can serve enterprises, industries, and the regional economy. In “One Garden and Four Centers”, teachers and students are teaching while learning, and learning while doing, to achieve the integration of teaching, learning, and doing.

4.2 On-campus internship

Constructing on-campus internship bases in higher vocational colleges can offer students more abundant and diverse practical opportunities, thereby enhancing their practical skills and accumulating real-world work experience to boost their employability. Establishing such internship bases also fosters closer industry-college partnerships between colleges and enterprises. With enterprises investing funds or equipment and colleges providing teaching and management, both partners collaborate to train talents that meet the needs of the industry.

On-campus practice should have a practice teaching syllabus and other relevant practice teaching documents, which stipulate the teaching purpose, teaching requirements, teaching content, teaching form, teaching conditions, teaching process and assessment method of each practice teaching link, to ensure the quality of practice teaching.

In the on-campus practice teaching management, the college internship supervisor responsibility system is implemented. In the course of practice, teachers and students should abide by labour discipline, production technology and service standards, production safety operation procedures, etc. The Academic Affairs Office should also check and assess the practical teaching. The on-campus internship base shall have an annual work plan and summary report, and the department (institute) shall submit it to the Academic Affairs Office for the record. At the end of the year, the on-campus internship base will be inspected and evaluated.

In case study three, the on-campus practical training is conducted according to the requirements of the training instructions for individual training and special training. The training assignment book is formulated first, and then the scheme is completed. Students complete training tasks under the guidance of teachers and submit training reports. Moreover, the teaching management process of comprehensive practical training generally adopts the following methods: reasonable grouping, task decomposition, making plans, teacher guidance and demonstration.

In case study four, DP4 has an associate dean who is responsible for the overall practice of teaching. In addition, the college internship supervisor is responsible for the specific management of the internship students. DP4 has formulated a series of practical teaching management documents, and established a practical teaching inspection, assessment and file management system.

4.3 Off-campus internship

Off-campus practice and in-post practice are effective measures of talent training required by the Ministry of Education in higher vocational colleges. The construction of off-campus internship bases is dominated by industry partners. The study and management of students during the off-campus internship base is carried out in cooperation between the College and the enterprise.

A senior manager from IP1 described it this way:

Our company attaches great importance to internship students. An internship contract is signed with each student before the internship. Moreover, we choose technical backbones as masters. Each master leads two students to teach them professional skills hand by hand and assess them. The company has also formulated special intern management regulations to standardize the daily management of interns (IP1, senior manager, 2022).

In all four cases, through the internship network platform, students should upload internship logs regularly and give feedback on the internship situation. Department partners and industry partners through the network platform, not only can solve the internship students on professional theoretical knowledge, practical skills, and other aspects of learning problems, but also can realize the dynamic management of students. College internship supervisors regularly provide online guidance through QQ, WeChat, etc. In winter and summer vacations, the college organizes teachers to visit students in enterprises. The teachers learn about students' lives and internships and negotiate with enterprises to solve the difficulties encountered by students.

The off-campus internship base is also a place for teachers to practice. Teachers can participate in the production, operation, and management activities of enterprises and get real first-hand information about enterprises. Through this method, teachers' practical work experience in enterprises is increased and practical ability is trained.

The key finding – "China model"

Through the study, it is found that there is a wide range of industry-college partnerships between China's higher vocational colleges and industries, and it has developed a model, the "China model". Higher vocational colleges and industry partners work together to train students and focus on improving their skills to meet practical needs. The two partners mainly collaborate in four aspects: course system construction, teaching process management, teacher management, and practical teaching management. In the teaching process, the real working situation of the enterprise is introduced as a learning project, and the vocational ability can be improved through project learning. Figure 1 shows the "China model" of industry-college partnerships.

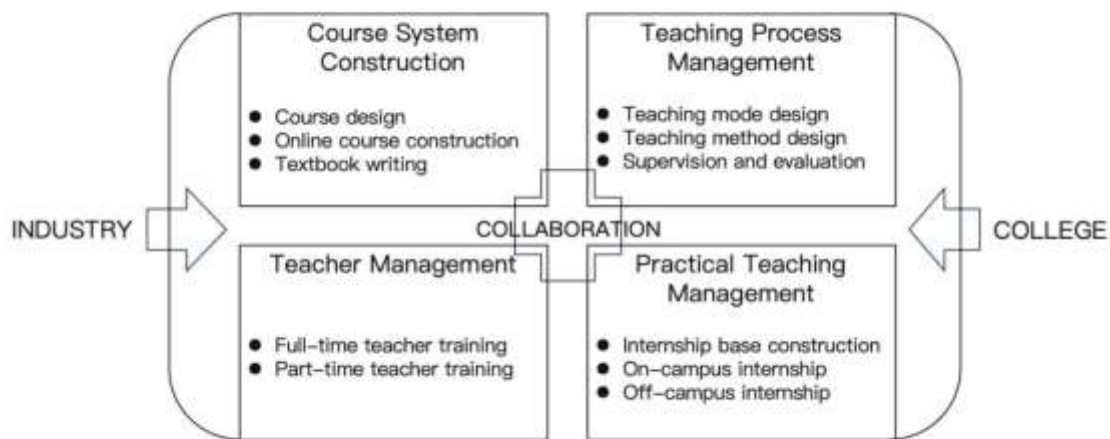


Figure 1: "China model" of industry-college partnerships

The "China model" details the main areas of partnerships between higher vocational colleges and industrial partners, which are course system construction, teaching process management, teacher management, and practical teaching management.

Higher vocational colleges work with industry partners to develop a course system that enables students to adapt to the needs of enterprises. The course development team composed of the two partners selects and organizes the course content according to the tasks of professional posts. Firstly, the relationship between productive occupations (i.e., social occupations/occupational groups) and educational occupations (i.e., majors) is analyzed. The course system (macrostructure) is formed from the analysis of occupations; then the structure of individual courses is formed from the analysis of positions (mesostructure); and finally, the course content (microstructure) is formed from the analysis of work tasks (Bing Liu, Zhiyong Yan and Quanquan Wu,

2018). At the same time, both partners should develop online courses to facilitate students to learn online and write textbooks to be suitable for teaching.

In the management of the teaching process, higher vocational colleges and industry partners jointly design teaching models, teaching methods, and supervise and evaluate the teaching process. Higher vocational colleges generally adopt an integrated teaching model. Teachers do while teaching, and students learn while doing. At present, the dominant teaching method in vocational education is the project teaching method, which is a teaching mode that relies on the project implementation process to carry out the teaching process. In industry-college partnerships, the supervision and evaluation of teaching process is very important, especially the supervision and evaluation of practice teaching process and practice stage. Supervision and evaluation cannot be carried out by the college alone, but also requires the participation of enterprises, governments or independent third parties to achieve the diversity of evaluation subjects.

In industry-college partnerships, the teacher management needs the joint participation of both partners. Teachers in higher vocational colleges should have "dual quality". This requires teachers of higher vocational colleges to regularly participate in practical activities in enterprises, always maintain close interaction with enterprise experts, and understand the actual work content and technological changes (Guoqing Xu, 2014). Higher vocational colleges also hire experts or skill masters from enterprises to enrich the teaching team. In practical teaching management, higher vocational colleges usually build internship bases with industry partners, including on-campus internship bases and off-campus internship bases. The construction of the on-campus internship base is jointly undertaken by the college and the enterprise. Industry partners contribute capital or equipment to make up for the shortfall in college funding. The College is responsible for the daily management. Off-campus internship base construction is based on industry partners. The college and the industry partner are jointly responsible for the learning and management of students during the internship. Before the internship, students sign agreements with colleges and enterprises. In the course of the internship, the enterprise arranges experienced experts to act as mentors for the students. The mentors are not only responsible for the student's learning but also for the daily management, as well as the evaluation. Yu Luo (2017) points out that as an internship place, the enterprise has the responsibility of supervising and controlling the work practice of the trainees under its jurisdiction, including attendance, yield and other attitudes and technical indicators.

Conclusion

Industry-college partnerships can be a useful strategy for training high-quality workers. In China, the various specialties of higher vocational colleges, in general, have established good industry-college partnerships with industry to train students who meet the needs of enterprises under a full range of management. The courses and programs offered by higher vocational colleges should keep in line with the technological development of industry and support the growth of industry and service. The management of higher vocational colleges should also conform to the characteristics of industry-college partnerships to promote the in-depth development of industry-college partnerships.

The "China model" provides a snapshot of industry-college partnerships in China, and contributes to the international community's understanding and knowledge of industry-college partnerships in China. This paper has significance to the literature relating to industry-college partnerships and the wider partnership agenda and provides a new way of thinking and perspective for the current study of industry-college partnerships in vocational education.

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