# Research on the Construction Path of Specialty Groups under the Background of Industry-academic Integration—Taking Pharmacy Specialty Groups as an Example

**Xiaohua He[1], Zhichun Wang[2], Yuehui Dong[2]**

[1]Department of Pharmacy, Jinan Nursing Vocational College, Jinan, 250000, China

[2]Jinan Nursing Vocational College, Jinan, 250000, China

**Keywords:** Industry-academic integration; Pharmaceutical professional group; Industrial chain docking; Construction of curriculum system; School-enterprise cooperation

**Abstract:** In this article, the path and strategy of pharmaceutical specialty group construction under the background of industry-academic integration are discussed in depth. Firstly, this article points out the importance of the industry-academic integration in tertiary education and the urgency of the construction of pharmaceutical specialty groups, and makes clear the purpose and significance of the research. Subsequently, this article expounds in detail the concept and connotation of the industry-academic integration, the necessity and challenges of the construction of pharmaceutical specialty groups, and lays a solid theoretical foundation for the follow-up research. This article conducts an extensive study and discussion on several pivotal aspects: the integration mechanism between pharmaceutical specialty groups and their industrial chains, the development of curriculum systems, the establishment of school-enterprise collaboration platforms and training facilities, as well as the formation of teaching staff and assurance of training quality. It underscores the significance of teaching staff development and training quality assurance within pharmaceutical specialty group construction. These findings serve as both theoretical guidance and practical insights for pharmaceutical specialty group development, while also offering innovative approaches to fostering industry-academic integration in higher education.

## 1. Introduction

With the rapid progress of globalization and informatization, industry-academic integration has become a key catalyst for the evolution and enhancement of tertiary education [1]. It optimizes educational resource allocation, elevates educational standards, accelerates technological advancements, and fosters sustained economic growth and industrial upgrading [2]. By bridging traditional education and industry, this integration achieves a seamless fusion of knowledge and skills, nurturing talents with innovation and practical abilities [3].

In the context of industry-academic integration, pharmaceutical specialty groups occupy a distinctive and promising niche within tertiary education [4]. These groups encompass a broad spectrum of domains, including drug research and development, production, quality assurance, and marketing, all of which are intricately tied to the growth of the pharmaceutical sector [5]. By leveraging industry-academic collaboration, pharmaceutical specialty groups are equipped to address industry demands, furnish a steady stream of talented professionals and technological advancements, and accelerate the pharmaceutical industry's expansion and modernization [6]. Moreover, the establishment of such groups fosters a deeper fusion between higher education and the pharmaceutical industry, cultivating a synergistic Industry-University-Research ecosystem that positively impacts the nation's economic prosperity and societal advancement [7].

Given the pivotal role of industry-academic integration in tertiary education and the unique contribution of pharmaceutical specialty groups, this article delves into constructing such groups within this framework. It seeks to offer theoretical and practical insights, enhance the integration of pharmaceutical education and industry, and elevate the educational quality and training standards of these groups.

  DOI: 10.25236/icssem.2025.003

## 2. Industry-academic integration & pharmaceutical specialty group construction

### 2.1. The concept and connotation of the industry-academic integration

As a new educational model, the core of the industry-academic integration is to closely combine the needs of the industry with educational resources and achieve mutual benefit and win-win through in-depth cooperation [8-9]. This model emphasizes the combination of theory and practice, and pays attention to cultivating students' practical ability and innovative spirit, so that they can better adapt to the needs of the future workplace. The main features of the industry-academic integration are shown in Figure 1.

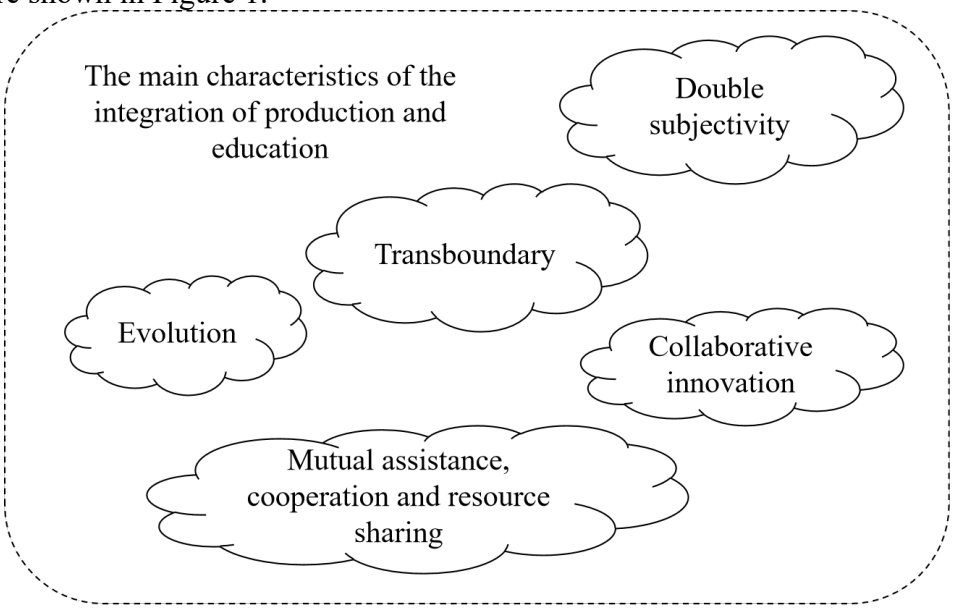


Figure 1 The main characteristics of the industry-academic integration

On a global scale, the industry-academic integration has become an important trend of tertiary education reform [10]. Many countries and regions have promoted the deep cooperation between universities, enterprises and industries through policy guidance and financial support. For example, the "dual system" education model in Germany and the "cooperative education" model in the United States are all successful practices of the industry-academic integration. These cases provide us with valuable experience, such as establishing a long-term mechanism of school-enterprise cooperation, perfecting the practical teaching system and strengthening the construction of teachers. It has important reference significance for the construction of the industry-academic integration of pharmaceutical professional groups.

### 2.2. Necessity and challenge of pharmacy specialty group construction

With the rapid growth and modernization of the pharmaceutical industry, the demand for pharmaceutical talent is continuously evolving, making traditional pharmaceutical education models insufficient for meeting current industry standards. Hence, the development of pharmaceutical specialty groups emerges as a crucial strategy to enhance the quality of pharmaceutical education and nurture high-caliber professionals. These groups facilitate the consolidation of educational resources, refinement of curricula, encouragement of interdisciplinary integration, and fostering of students' comprehensive literacy and innovative capabilities.

Given the swift transformations in the pharmaceutical sector, pharmaceutical education must align with industry trends and continually revamp its teaching content and methodologies. Establishing pharmaceutical specialty groups necessitates substantial investments of human, material, and financial resources, requiring collaborative efforts from governments, universities, and enterprises. Additionally, key challenges in developing these groups include establishing an effective school-enterprise cooperation framework and ensuring alignment between the quality of personnel training and industry needs.

## 3. Exploration on the path of pharmacy specialty group construction under the background of industry-academic integration

### 3.1. Docking mechanism between pharmaceutical specialty group and industrial chain

Amidst the landscape of industry-academic integration, the harmonious alignment between pharmaceutical professional groups and the pharmaceutical industry chain stands as a pivotal factor in enhancing educational quality and addressing industry demands. To facilitate this alignment, it is imperative to keep curricula abreast of industry trends, ensuring that teaching content remains intimately tied to industry needs. Instructors must emphasize practical instruction, enabling students to engage in real-world learning and practice through school-enterprise partnerships and the integration of production with teaching, thereby bolstering their practical skills and professional competencies.

Moreover, practical training constitutes a vital bridge connecting academia with the industry chain. Through collaborative efforts with enterprises to establish practice training bases, students gain invaluable opportunities to actively participate in various stages of drug research and development, production, and sales. This immersive experience not only deepens their understanding of industry operations but also aligns them with market demands.

In the process of docking, you may encounter some obstacles. For example: the mismatch between educational resources and industry demand, the imperfection of school-enterprise cooperation mechanism, etc. In order to solve these problems, we need to establish an effective communication mechanism (as shown in Table 1), strengthen the information exchange between schools and enterprises, and ensure the close connection between educational content and industry needs.

Table 1 Communication Mechanism for Docking Pharmaceutical Specialty Clusters with the Pharmaceutical Industry Chain in the Context of Industry-Education Integration

| Elements of Communication Mechanism | Specific Contents |
|---|---|
| Communication Subjects | Schools: Teachers and administrative staff of pharmaceutical specialty clusters; Enterprises: Representatives from the pharmaceutical industry and HR departments |
| Purpose of Communication | Ensure educational content is closely aligned with industry needs; Facilitate the smooth implementation of school-enterprise cooperation projects; Resolve obstacles and issues arising during the docking process |
| Modes of Communication | Regular school-enterprise cooperation meetings; Establishment of joint school-enterprise working groups; Utilization of modern information technology to establish an online communication platform |
| Content of Communication | Sharing of industry trends and talent demands; Discussion on curriculum setting and teaching content adjustments; Negotiation on construction and operation plans for internship and training bases; Feedback on progress and outcomes of school-enterprise cooperation projects |
| Frequency of Communication | Regular meetings: At least once per semester; Joint working group meetings: Held as needed based on project requirements; Online communication: Conducted in real-time to ensure smooth information flow |
| Feedback Mechanism | Establish a problem feedback mechanism to timely collect and address opinions from both parties; Regularly assess communication effectiveness and adjust communication strategies |
| Safeguard Measures | Formulate a management system for school-enterprise cooperation communication; Clarify responsibilities and duties of communication coordinators; Provide necessary funding and technical support |

Table 1 lists the elements of communication mechanism needed in the process of docking pharmaceutical professional groups and pharmaceutical industry chain under the background of

industry-academic integration, including communication subject, purpose, mode, content, frequency, feedback and safeguard measures. Its purpose is to ensure that the two sides can communicate effectively and jointly promote the deep integration of education and industry. The government and all walks of life should also increase their support for the industry-academic integration, provide policy and financial protection, and promote the deep integration of pharmaceutical professional groups and pharmaceutical industry chain.

### 3.2. Curriculum system of pharmaceutical specialty group under the mode of industry-academic integration

The construction of the curriculum system of pharmaceutical specialty group under the mode of industry-academic integration needs to be closely focused on the needs of the industry. Schools should adjust the curriculum and teaching content according to the development trend and market demand of the pharmaceutical industry to ensure that the knowledge learned by students matches the needs of the industry. Schools need to strengthen practical teaching and innovation ability training, and increase the proportion of practical teaching links such as experiments and training, so that students can learn and grow in practice.

In terms of specific strategies, this article thinks that the pharmaceutical specialty group should be divided into different modules by means of modular curriculum, and each module corresponds to a specific field of pharmaceutical industry. Schools should strengthen interdisciplinary cooperation and exchanges, promote the integration and infiltration of different modules, and cultivate students' comprehensive literacy and innovation ability. In terms of implementation steps, schools can start from a small scale, gradually accumulate experience and promote it to the whole pharmaceutical professional group.

### 3.3. School-enterprise cooperation platform and training base construction

The construction of school-enterprise cooperation platform and training base is an important part of the construction of pharmaceutical specialty group under the background of industry-academic integration. Through school-enterprise cooperation, we can establish a close cooperative relationship in Industry-University-Research and jointly promote the development of pharmaceutical specialty groups. In the construction of cooperation platform, we can jointly set up research and development centers, laboratories and other cooperative institutions with enterprises to provide space for teachers and students to practice and innovate. Schools should strengthen the construction of training bases, and the location should be close to the pharmaceutical industry gathering place or enterprise production base to facilitate students' internship and training; Equipment configuration should be advanced and complete to meet the needs of teaching and scientific research; The management mode should be flexible and efficient to ensure the normal operation and sustainable development of the training base.

### 3.4. Construction of teaching staff and quality assurance of personnel training

Under the background of the industry-academic integration, the core of the construction of pharmaceutical specialty group lies in the construction of teaching staff. We must strengthen the construction of the teaching staff of pharmacy specialty group, and constantly improve the teaching level and practical ability of teachers. Specific measures include: absorbing industry experts with deep practical background as part-time teachers or visiting professors to impart the latest knowledge and skills in the industry to teachers and students; Encourage teachers to go deep into the enterprise for attachment training or participate in enterprise scientific research projects, so as to improve teachers' practical operation ability and scientific research literacy.

In terms of quality assurance of personnel training, schools need to establish a perfect assessment system and process monitoring mechanism. The assessment system should include student assessment, teacher assessment, curriculum assessment and other aspects to ensure the objectivity and accuracy of the assessment results. The process monitoring mechanism should run through the whole process of personnel training, including curriculum setting, teaching implementation, practice training and other links to ensure the steady improvement of personnel training quality.

## 4. Conclusions

In this article, the path and strategy of pharmacy specialty group construction under the background of industry-academic integration are discussed in depth. This article systematically analyzes and elucidates the mechanism underlying effective integration between pharmaceutical specialty groups and the industry chain. It proposes tailored strategies for curriculum adjustment in line with industry demands and delves into the significance and blueprint for establishing school-enterprise cooperation platforms and training bases. Emphasis is placed on the crucial roles of faculty development and personnel training quality in shaping pharmaceutical specialty groups. These findings offer both theoretical direction and practical insights for the formation of such groups and introduce innovative approaches to fostering industry-academic integration within higher education. Furthermore, the study underscores the vital importance of this integration in enhancing tertiary education quality and fulfilling industry needs, while highlighting the distinct role of pharmaceutical professional groups in driving the pharmaceutical sector forward.

The pharmaceutical industry's swift progress and industrial enhancement present both challenges and opportunities for the formation of pharmaceutical specialty groups. Moving forward, it is imperative to closely monitor and explore emerging issues and trends within these groups, particularly in the context of industry-academic collaboration.

## References

[1] Sun Xu, Liao Xiaohong, Cai Qingqun, et al. Construction of an Indicator System for Talents in the Professional Degree of Master of Pharmacy Based on the Delphi Method [J]. Anhui Medical and Pharmaceutical Journal, 2021, 25(12): 2531-2537.

[2] Gong Jian, Zhang Lingjian, Ding Xuansheng, et al. The Impact of Healthy China Construction on the Teaching Mode of Clinical Pharmacy Professional Degree Graduate Students [J]. Chinese Journal of Public Health, 2021, 37(11): 1718-1720.

[3] Zhao Tianhui, Liu Jingcheng. Construction and Practice of a Professional Group for Liquor-Making Technology Based on Deepening the Integration of Industry and Education [J]. Food Industry, 2024, 45(1): 191-194.

[4] Wang Zuopeng. Analysis of the Implementation Path for the Construction of Higher Vocational Professional Groups with Industry-Education Integration as the Logical Main Line [J]. Education and Vocation, 2021, 998(022): 91-96.

[5] Chen Jingze, Hu Mingle, Luo Jiawei, et al. Pharmacy Service Practice in Designated Hospitals for the Treatment of COVID-19 [J]. China Pharmacy, 2020, 31(05): 536-539.

[6] Tian Jinhui, Li Jiang, Ge Long. Constructing an Evidence Ecosystem for Medical and Pharmaceutical Education to Promote the Development of Evidence-Based Teaching [J]. Chinese Journal of Pharmaceutical Guide, 2022, 24(9): 884-888.

[7] Zhang Ying, Fang Hongjuan. Cultivating Medical Students' Scientific Popularization Ability in Pharmacy Teaching [J]. Basic Medicine and Clinic, 2023, 43(7): 1175-1178.

[8] Tang Lingzhi, Chen Lanmei, Li Yuan, et al. Practice in Constructing a Pharmaceutical Chemistry Course for Applied Undergraduate Pharmacy Majors [J]. China Pharmaceutical News, 2024, 21(4): 78-81.

[9] Mo Xuelin, Guo Dongkai, Cheng Ping, et al. Analyzing the Current Situation of Hospital Pharmaceutical Outpatient Clinics and Studying Development Strategies Based on the SWOT Method [J]. Pharmaceutical Care and Research, 2021, 21(03): 233-238.

[10] Zheng Yan. Evaluation of the Development Level of Professional Groups in Double Higher Education Institutions: Model Construction and Application Analysis [J]. Vocational and Technical Education, 2022, 43 (01): 18-23