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Reform and Practice of Experimental Practice Courses in Pharmaceutical International Trade under the New Liberal Arts and New Medical Science Framework

Hui Hua[1,]*, Yao Gong[2], Yuhong Liu[3]

[1,2,3]International Business School of Medicine, China Pharmaceutical University, Nanjing 211198, Jiangsu, China
[1]huahui021@163.com, [2]yao.gong19@icloud.com, [3]18304549038@163.com
**Correspondence Author*

Abstract: ***Under the backdrop of the new liberal arts and new medical reforms, experimental practice teaching plays a crucial role in the training process of pharmaceutical trade professionals. However, the integration of medicine and trade disciplines remains inadequate in the education of medical trade majors, leading to several issues in the curriculum design for experimental practice courses, such as outdated course objectives, teaching methods, and instructional designs. The reform of medical experimental practice courses should align with industry developments, broaden teaching perspectives, and diversify teaching formats, scenarios, and content. By integrating multiple resources, developing through various channels, and collaborating across different scenes, we can collectively advance the teaching reform of pharmaceutical experimental practice courses and cultivate high-quality pharmaceutical trade professionals who meet the demands of modern productivity standards.***

Keywords: New liberal arts, New medical science, International trade in medicine, Experimental practice, Curriculum reform**.**

1. Introduction

1.1 Research Background and Necessity

In August 2018, the General Office of the Communist Party of China Central Committee and the General Office of the State Council jointly issued the Guiding Opinions on Accelerating Educational Innovation [1]. This document formally established the frameworks for New Liberal Arts (NLA) and New Medical Science (NMS). The term "New" does not merely denote incremental updates to traditional disciplines but signifies transformative innovations characterized by interdisciplinary convergence and systemic restructuring. As China transitions from an educationally expansive nation to an educationally advanced power, NLA and NMS have emerged as critical drivers in fulfilling three core historical mandates: 1) Cultivating transdisciplinary talent pools through the integration of medical science, international trade, and digital humanities into curricula; 2) Advancing pedagogical methodologies via digital transformation and scenario-based learning ecosystems; 3) Supporting national strategic priorities in healthcare internationalization and cultural heritage preservation. This dual disciplinary framework exemplifies China's commitment to systemic educational reform, addressing both the urgent needs of industrial modernization and the preservation of civilizational continuity.

The 20th National Congress has elevated the initiative of "promoting the construction of Healthy China" to a strategic priority [2]. This aligns with the Dual-Circulation Development Paradigm and the Belt and Road Initiative, both of which facilitate cross-border pharmaceutical trade and digital economic transformation. Given the rapid growth of the health industry and the emerging demand for new quality productivity (NQP), there is an urgent need for professionals in medical trade who can adeptly manage innovative pharmaceutical technologies and adapt to evolving digital business models. Although current pedagogical methods, such as case studies and software simulations, have enhanced practical skills in international trade, they fall short in addressing real-world challenges like global regulatory coordination and supply chain resilience. Curriculum reforms should integrate virtual simulation with industry partnerships, leveraging AI-driven platforms for scenario-based training in WTO dispute resolution and real-time trade analytics. These adjustments are consistent with the congress's emphasis on education-industry synergy to cultivate talent that supports the objectives of Healthy China 2030.

1.2 Problems Existing

In the context of new liberal arts and new medical sciences, comprehending the cross-integration of disciplines is a critical foundation for cultivating interdisciplinary talents. This understanding further elucidates the driving force behind the deep integration of "science and education" and "industry and education" on teaching practices, thereby promoting the development of interdisciplinary innovative talents to meet societal, industrial, and productivity needs. In the field of trade, China is guided by digitalization, leveraging the dual drivers of foreign trade product innovation and structural upgrading. This approach enhances traditional trade efficiency, extends the trade value chain, and continuously promotes the optimization of trade models. In the medical field, with the rise of domestic innovative drugs, practitioners are required to possess knowledge reserves and application capabilities in drug research and development, production, trade, regulations, policies, and other areas. However, in the experimental practice teaching of pharmaceutical trade courses, the cross-integration of these two aspects presents new challenges to the design of the teaching process and the realization of teaching

objectives, particularly in experimental practice. Therefore, it is essential to conduct an in-depth analysis of teaching issues from the perspective of integrating new liberal arts and new medical sciences, delve into trade development and the pharmaceutical industry, and identify key convergence points. This will improve the teaching design of experimental practice courses, optimize course organization, and enhance teaching effectiveness [3].

1.2.1 The goal setting for experimental practice courses in the field of medical trade lags behind and does not fully align with the requirements of talent cultivation.

The National Standards for Teaching Quality in Economics and Trade have outlined methods for conducting practical teaching in trade majors, while the Guide for Ideological and Political Teaching in Economics and Trade Majors at Colleges and Universities has further emphasized guiding students to deepen their social practice in economic and trade fields and pay attention to practical issues. Professional course instruction should focus on economic and trade practical issues, continuously enhancing students' ability to solve such problems through various forms of practical experience, including professional practice courses, theoretical courses, and extracurricular activities, thereby fostering a cycle of learning from and returning to practice. However, in specific teaching practices, the experimental practice courses in medical trade encompass both trade-related and pharmaceutical courses. In the cross-integration of these two types of courses, there is a lack of systematic organization of experimental courses, practical courses, practical components within theoretical courses, and extracurricular practical activities. This results in a disconnect in achieving teaching objectives between courses. Additionally, it fails to fully clarify the value and comprehensive requirements of interdisciplinary integration on the cultivation of talents in international pharmaceutical trade, and does not adequately integrate the practical requirements and training objectives of interdisciplinary courses like pharmaceutical trade. Consequently, students face unclear goals and insufficient motivation when studying critical subjects impacting the pharmaceutical industry, such as international and domestic pharmaceutical regulations.

1.2.2 The teaching methodology for experimental practice courses in pharmaceutical trade is relatively outdated, presenting a significant gap with the rapid advancements of the times and industry demands.

Currently, the instructional approach predominantly relies on virtual simulation technology to replicate international trade processes via specialized software or conducts experimental operations such as international settlements and trade documentation through task-oriented formats. Additionally, practical education primarily takes the form of graduation internships, with activities mainly consisting of offline visits. This limited scope of learning channels restricts students' initiative and hinders the development of trade practice skills. Moreover, students find it challenging to transcend environmental and conditional constraints within specific practical forms, thereby impeding innovation in undergraduate practical teaching models and affecting student practical outcomes. Furthermore, the medical trade experimental practice course lacks integration of emerging technologies such as virtual reality (VR) and augmented reality (AR), innovative medical trade scenarios, and digital economy virtual simulations. The absence of these elements limits the utilization of digital economy technology to create opportunities for on-campus simulations or practices, ultimately impacting the overall teaching effectiveness.

1.2.3 The instructional design of experimental practice courses is somewhat outdated and exhibits a notable discrepancy when compared to current industry practices.

Currently, the content of trade experimental practice teaching primarily depends on trade simulation software. Through role-playing exercises, students gain insights into the specific procedures of trade, application scenarios of knowledge, and business capability requirements. Despite continuous updates and enhancements in the development of simulation software, the teaching content lags behind advancements in practical trade simulations, lacking innovation, progress, and foresight. Moreover, the teaching materials for trade experimental practice predominantly emphasize operational processes and are task-oriented, which may not sufficiently inspire students' creative thinking and practical skills. Consequently, students' capabilities remain confined to experimental tasks or trade processes, limiting their overall development. Furthermore, the experimental practice course for pharmaceutical trade is currently restricted to a single trade perspective. However, actual pharmaceutical trade encompasses not only regulatory subdivision requirements but also the influence of laws and regulations on business processes. Therefore, the design of the experimental practice course system for pharmaceutical trade and the specific course content should not be limited to a single-discipline perspective. Instead, it should comprehensively reflect the interdisciplinary abilities required by new liberal arts and new medical science.

2. Reform and Practice

The essence of the New Liberal Arts and New Medical Science lies in the seamless integration of modern science and technology with production practices, propelled by interdisciplinary convergence. Over several years of pedagogical exploration and with a focus on the holistic health concept encompassing the entire health process, we have developed and implemented an instructional model that combines theoretical instruction, experimental practice, and virtual simulation into practical teaching applications.

2.1 Monitor the Evolving Requirements of the Emerging Health Industry and Define the Instructional Objectives for the Pharmaceutical Trade Experimental Practice Course

Medical trade experimental practice courses should be fundamentally grounded in the "Healthy China" strategy and the evolving needs of the modern health industry. It is essential to understand the knowledge, skills, qualities, and character traits that medical trade students should possess in this new era. On this foundation, elements of ideological and political moral education should be integrated, aiming to cultivate high-quality, interdisciplinary medical trade professionals with an international perspective and

comprehensive abilities.

The design of pharmaceutical trade experimental practice courses should prioritize the integration of medicine and trade, focusing on meeting public healthcare needs. As China's pharmaceutical and health industries advance, the unique characteristics of medicines, the special social attributes of the pharmaceutical sector, and the growing health demands of the population have become increasingly prominent in teaching practices. Therefore, the experimental practice course should align with the progression of the knowledge system in the teaching process, emphasizing overarching goals, refining curriculum training objectives, and integrating knowledge, skill, and quality goals. Additionally, under the context of new liberal arts and new medicine, interdisciplinary practical ability goals should be incorporated to enable students to grasp the practical integration of trade and medicine, understand the social value and significance of pharmaceutical trade, actively enhance their own competencies, broaden their horizons, join the pharmaceutical trade industry, and safeguard public health.

At the same time, the objectives of the experimental practice course in pharmaceutical trade should be aligned with those of the theoretical course. The theoretical course should establish a comprehensive and systematic curriculum framework encompassing the entire lifecycle of pharmaceutical trade, including research and development, production, registration evaluation, logistics distribution, pricing and reimbursement, market access, and regulatory oversight. This approach will facilitate the cultivation of cross-disciplinary health management professionals. Therefore, the objective of the experimental practice courses is to ensure that students not only comprehend and master the relevant theories and knowledge within the aforementioned curriculum framework but also develop the ability to analyze pharmaceutical trade issues from multiple perspectives and through multidisciplinary lenses. This approach aims to achieve a seamless integration of theory and practice, as well as foster interdisciplinary connections between pharmacy, law, and economics. Furthermore, through the reform and reconstruction of the course content, we will integrate the most recent practical cases that exemplify the achievements of China's pharmaceutical trade.

2.2 Expand the Pedagogical Approaches for Experimental Practice Courses, Enrich the Course Content, and Enhance the Comprehensiveness of Interdisciplinary Instruction

Under the guidance of the new liberal arts and new medical concepts, it is imperative to broaden the scope of course design, explore diverse course resources, integrate industry-specific characteristics, and enhance both the depth and format of experimental practice courses.

First, based on the optimization of course objectives, the structure of pharmaceutical trade courses is primarily adjusted across four dimensions. Firstly, experimental courses are designed to integrate the practical development of international trade, introducing business-process-oriented experimental courses in lower grades. As a foundational component of the general education curriculum for this major, students will gain an understanding of the primary work content, career development pathways, and competency requirements associated with trade-related fields. Additionally, the design of practical courses and training programs has been further refined. Building upon the core curriculum, comprehensive practical training in international trade has been established. This allows students to comprehend the selection of trade terms, settlement methods, and dispute resolution techniques within complex trade scenarios simulated in a virtual environment. The integration with the pharmaceutical industry, by organizing students to participate in pharmaceutical trade exhibitions, facilitates practical activities that enable students to comprehend the subdivisions of the pharmaceutical trade and the requirements for professional competencies. Through exhibition participation, students can effectively experience future work scenarios in the pharmaceutical trade, understand job responsibilities, and deepen their professional knowledge. Furthermore, participation in the exhibition is not confined to pharmaceutical trade fairs; professional trade exhibitions also pique the interest of students, aiding them in exploring the current state and development trends of foreign trade. Additionally, on this foundation, students are selected and encouraged to actively participate in relevant academic competitions [4], such as foreign trade competency contests, cross-border e-commerce innovation and entrepreneurship competitions, and the National University Business Elite Challenge, among others. This approach aims to fulfill students' personalized developmental needs and provide platforms for showcasing their abilities while broadening their practical experience channels. Fourthly, we should endeavor to create opportunities for collaboration with pharmaceutical enterprises and broaden internship channels for students. Currently, through partnerships with leading domestic pharmaceutical companies, we organize business visits and summer internships to assist students in gaining insights into the market status of specific product areas within the pharmaceutical industry, production processes, and both international and domestic market access strategies.

Second, building upon the optimization and adjustment of the experimental practice curriculum system, innovative experimental practice formats can be developed to enhance teaching effectiveness [5]. Currently, courses that leverage virtual simulation software are typically conducted in computer laboratories, where relevant operational procedures or experimental tasks can be completed either individually or through multi-group collaboration. In actual teaching scenarios, the learning outcomes of individual students vary. Although experimental teaching primarily focuses on process evaluation, it is challenging for the course content to fully capture the true abilities and unique characteristics of each student. Consequently, in the context of curriculum reform, an innovative approach has been adopted by integrating competitions with coursework, encouraging students to engage in practical training through extracurricular competitions. However, it is essential that the knowledge, ideas, and methods acquired by students during these competitions be integrated back into the curriculum. The participating students can mentor their peers who have not taken part in the competition, thereby facilitating the completion of practical training. The guidance process may be organized through randomized teams or class-based units,

fostering collaboration and mutual assistance. This approach not only enhances student engagement and exploration of the course content but also diversifies the learning experience while supplementing the traditional teacher-led instructional model with peer-to-peer learning. It broadens the avenues for students to acquire knowledge through multiple channels, thereby enhancing their learning initiative and improving both their satisfaction with the course and the actual teaching effectiveness. For exhibition-based practice visits, students from grades two to four can apply for activities based on their individual circumstances. Additionally, teachers divide students into different groups according to each exhibition's theme, assign them task-oriented recording of the exhibits, encourage analysis of products, facilitate communication with company personnel, and ultimately share insights gained from participation through reports and summaries. Despite the limited number of students participating in each activity, peer interaction and the ongoing development of these activities significantly broaden students' understanding and thinking regarding the trade and pharmaceutical industries. This enables students to gain firsthand practical experience of the social requirements for pharmaceutical trade professionals. Consequently, students' engagement in experimental practice courses transcends mere score attainment, shifting their focus towards enhancing personal capabilities and accumulating practical experience, thereby making their career path choices clearer and more confident.

Third, we should investigate the informatization of teaching methodologies and refine the teaching evaluation system. By leveraging both internal and external school resources, experimental practice teaching in medical international trade can continuously enhance its instructional formats through the application of information technology. Through the integration of modern information technologies including knowledge graphs, artificial intelligence, and virtual teaching environments, we have collaborated with relevant enterprises to introduce VR into the educational process. This enables students to deepen their understanding and enhance their learning experience through immersive interactions, thereby enriching the diversity of teaching methodologies. In the aforementioned teaching process, the attitudes, behaviors, and learning outcomes of students participating in experiments, practical training, and related activities can be objectively documented. The criteria are clearly defined, the process is traceable, and this method effectively reflects the genuine learning outcomes and efforts of students. Additionally, recognition and rewards should be provided for students' achievements in competitions to encourage and support them in exploring interdisciplinary fields, stepping outside the classroom, and engaging with society. This approach promotes the acquisition of practical skills and abilities, rather than viewing scores as the sole criterion for evaluating their efforts and accomplishments [6].

3. The Practical Impact and Reflections

Through the reform of the teaching mode for the experimental practice course in Pharmaceutical International Trade, our university's program has garnered positive feedback from students and received high recognition from the industry. Since 2016, we have participated in the Foreign Trade Competence Competition and the Cross-border E-commerce Innovation and Entrepreneurship Competition, securing multiple group first, second, and third prizes as well as individual awards. In 2023, we participated in the Business Elite Challenge and won the group second prize. Simultaneously, we organized student participation in several key industry events, including the 89th China International Pharmaceutical Raw Materials / Intermediates / Packaging / Equipment Fair (API China), the 27th China International Pharmaceutical Exhibition and Technology Exchange Conference (CHINA-PHARM), the second Global Digital Trade Fair, and the National Drug Fair. Additionally, we co-hosted the "Pharmaceutical Internationalization: Cooperation, Innovation, and Development" Forum with the China Chamber of Commerce for Import and Export of Medicines and Health Products. These activities were designed to enhance the in-depth interaction between students majoring in pharmaceutical trade and the industry, provide a comprehensive perspective on the pharmaceutical industry chain, and facilitate the integration and application of theoretical knowledge and practical experience [7].

Furthermore, the international pharmaceutical trade is characterized by intense competition, stringent regulatory compliance, and a high degree of technological sophistication. Concurrently, supported by favorable policies, China's pharmaceutical industry is transitioning from manufacturing to innovation, evolving from imitation to originality. Local pharmaceutical enterprises are actively exploring international markets, with China's innovative drugs progressively entering the global arena. Consequently, guided by the principles of new liberal arts and new medical science, the experimental practice course in pharmaceutical international trade is redefining its objectives, establishing new goals, constructing a comprehensive system, and incorporating enriched content. This initiative aims to cultivate high-caliber pharmaceutical trade professionals for the new era and contribute significantly to the innovation and development of the pharmaceutical sector.

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