

Exploration of Construction Path of Modern Industry College under the Background of Integration of Industry and Education

Zhipeng Sun, Ye Li

School of Health Care Technology, Chengdu Neusoft University, Chengdu, China

Keywords: Integration of Industry and Education; Modern Industrial College; Practice

Abstract: Modern Industry Colleges are a new type of educational organization that integrates talent cultivation, scientific and technological research, and social services. It represents an innovative exploration in the development process of modern higher education and it is an inevitable measure for higher education to support the country's economy in achieving higher-quality development in the new era. Chengdu Neusoft University's Digital Health Industry College keeps pace with the needs of socio-economic development and the market, adhering to Neusoft integrated development model of Industry-University-Research. It focuses on "IT + Healthcare technology" to carry out the cultivation of applied talents, scientific research, and industrial services. It focuses on moral education, consolidates school-enterprise cooperation, deepens the integration of education and industry, and constructs a management and education mechanism named "four sharings, three integrations and eight collaborations". Through the exploration and continuous optimization of the construction of the Digital Health Industry College, it provides a reference for the construction of modern industry colleges.

1. Introduction

In December 2017, the General Office of the State Council issued the "Several Opinions on Deepening the Integration of Industry and Education" (Guobanfa [2017] No.95), which clearly pointed out that deepening the integration of industry and education, and promoting the organic connection between the education chain, talent chain, industry chain, and innovation chain, is an urgent requirement for advancing the structural reform of the supply side of human resources. It is of great significance for comprehensively improving the quality of education, expanding employment and entrepreneurship, promoting the transformation and upgrading of the economy, and cultivating new drive forces for economic development under new circumstances [1]. With the accelerated advancement of the integration of industry and education and the continuous deepening of the reform and innovation of higher education, the modern industrial college model has emerged and ushered in a construction boom. In July 2020, the General Office of the Ministry of Education and the General Office of the Ministry of Industry and Information Technology jointly issued the "Guidelines for the Construction of Modern Industrial Colleges (Trial)" (Jiao Gao Ting Han [2020] No. 16) [2], encouraged application-oriented colleges and universities to aim at the integration point with local economic and social development, exploring the construction model of modern industrial colleges, and put forward clear requirements for the construction goals, principles, and tasks of modern industrial colleges [3].

2. Basic Information about Digital Health Industry College

As a practical-oriented university, Chengdu Neusoft University has always been committed to cultivating high-quality practical talents who can adapt to national economic development and industry demands. It has always taken the integration of industry and education as an important cornerstone for the construction of a high-level practical-oriented university, and has earnestly carried out in-depth cooperation with enterprises to promote the joint education of industry and education. The founder of the university, Neusoft Group, is a leading global information technology, products, and solutions company in the industry. Through innovative software solutions, it promotes the

innovative development and digital transformation of various industries such as education, healthcare, social security, transportation, and finance. Therefore, Chengdu Neusoft University has a profound foundation and a significant advantage in the integration of industry and education, and the construction of industry colleges, especially in the field of healthcare. The Neusoft Healthcare Industry Alliance provides comprehensive medical solutions based on medical equipment, smart medical services, information platform construction, AI+medicine, and other directions. The strong industrial genes and accumulation of medical health provide a solid foundation and more possibilities for the construction of the digital health industry college of Chengdu Neusoft University.

Relying on Neusoft's accumulation in the fields of medical health and information technology, serving the national "Healthy China" strategy and regional economic and social development needs. Combining with the healthcare industry planning of Dujiangyan, Chengdu Neusoft University established the Health Medical Technology College in 2021. It fully leverages the university's strengths in big data, artificial intelligence, computer science, information management, and other aspects, focuses on the "IT + healthcare technology", and develops health-related majors with "smart + medical" characteristics. It emphasizes cultivating students' practical abilities in "medicine + engineering" and "medicine + management", as well as their abilities in new technology application, innovation, and entrepreneurship. The college highly values the construction of industry-oriented colleges. At the beginning of its establishment, it gathered 13 industry partners to form the Digital Health Industry Alliance, planned to build a digital health industry college. Based on the construction of health service management majors, it initially constructed a collaborative education ecosystem of "university + industry association + medical college + health management service enterprise". This measurement aims to implement the requirements of the national "Healthy China" strategy and serve the high-quality development of the medical health industry and regional economy.

3. Construction Goals of Digital Health Industry College

3.1 Establishing the Operational Mechanism of the Industry College and Creating a Community of Shared interests between School and Enterprises

Upon the successful cooperation between school, enterprises and medical institutions in the early stages, Chengdu Neusoft Institute of Health and Medical Technology has seized the opportunity presented by the construction of Neusoft Smart Health Industry Park - a platform for deep integration of industry, education, research, and production. Through this initiative, the institute is exploring the implementation of management methods, organizational structures, and system developments that differ from traditional teaching approaches. It is also examining flexible and diverse modes of cooperation, as well as establishing relatively independent operational mechanisms. These efforts aim to address the problems of superficiality, formalization, and lack of true integration that often plague traditional school-enterprise collaborations [4] [5]. By doing these, the institute seeks to strengthen the foundation of its digital health industry academy and achieve win-win results between industry and education.

3.2 Deepening the Integration of Industry and Education, Innovating Education Models, and Promoting Complementary Strengths

To fully leverage the advantages of the industry and the crucial role of enterprises as educational entities, Chengdu Neusoft Institute of Health and Medical Technology is committed to establishing and improving communication mechanisms with industries and enterprises. Through it the institute can promptly grasp industry trends, market talent gaps, and individualized corporate needs. Consequently, the institute can refine its collaborative talent cultivation mechanisms and innovate talent training programs, teaching methodologies, curriculum systems, and practical training mechanisms. Furthermore, it aims to establish a resource-sharing mechanism encompassing talents, information, technology, and equipment, which promotes synergy among government, industry, university, and research institutions. This effort aims to nurture high-quality, application-oriented, composite, and innovative talents who are well-suited to the demands of the grand health era.

3.3 Based on Application-Oriented Research, Serving Regional Economy and Industrial Innovation Development

The Digital Health Industry adopts an application-oriented approach, focuses on the critical issues of industrial technological innovation. It prioritizes researches of new traditional Chinese medicine, intelligent healthcare, large-scale modeling, as well as precise and personalized healthcare and wellness solutions. By fostering a collaborative innovation environment among the institute's research teams, affiliated hospitals, and corporate R&D groups, it achieves effective integration across industrial, innovation, and educational chains. This integration serves for regional economic development and industrial innovation, ultimately providing Neusoft solutions for the future of smart health.

4. Construction Path and Operation Practice of Digital Health Industry College

4.1 Exploring the Operation Mechanism to Ensure the Sustainable Development of Digital Health Industry College

In order to ensure the healthy and sustainable development of the Digital Health Industry College, the university has set up a leading group for the construction of the Industry College. The main members of this committee consist of leaders in charge from both the school and its co-construction units. They provide the guidance for the formulation of operational mechanisms, work plans, job responsibilities, and evaluation systems for the institute. This effort aims to genuinely promote the construction of an ecosystem that fosters multi-party cooperation and collaborative education, thereby ensuring that the Industrial Institute has implemented and carried out in accordance with its established construction goals and paths.

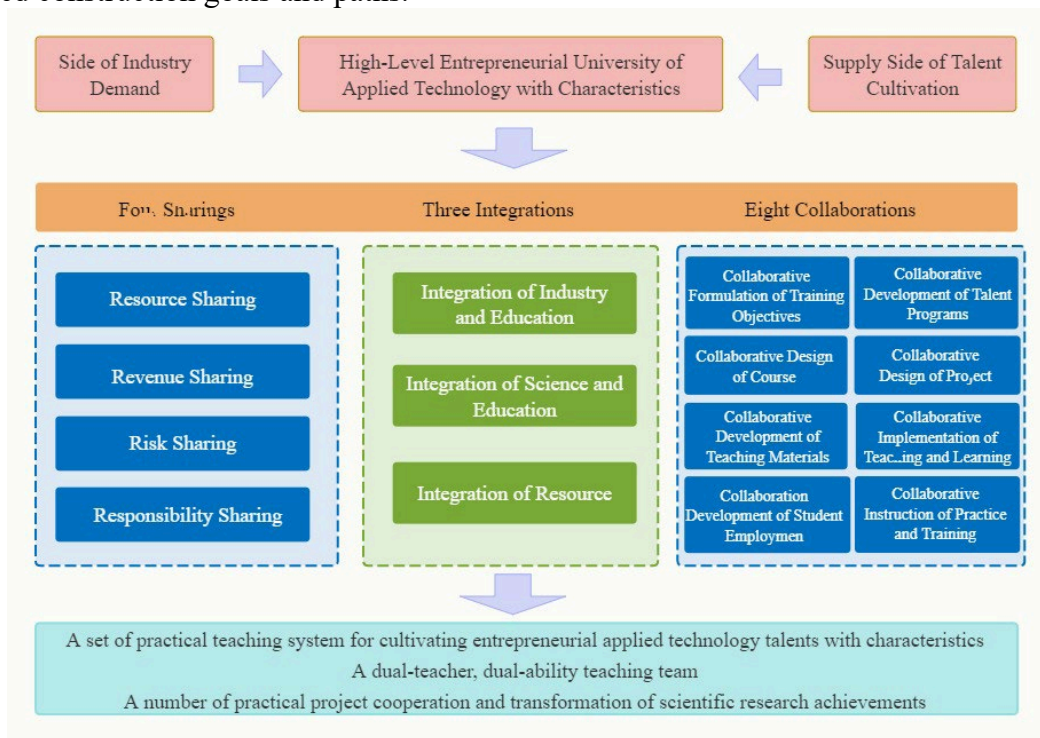


Fig. 1 Construction Path of Industrial College

4.2 Construction Path of Digital Health Industry College

Under the framework of modern industry college construction requirements, the institute implements a president responsibility system guided by a construction leadership team, constructs a management mechanism of "Four Sharings, Three Integrations, and Eight Collaborations," which promotes Integration of Industry and Education, scientific research and education integration, and resource integration. The goal is to build a digital health industry college with regional characteristics

and to serve local economic development, which integrates functions such as talent cultivation, scientific research, technological innovation, enterprise service, and student entrepreneurship (the construction path showed in Fig.1). Through the establishment of a collaborative education mechanism and the construction of practical training platforms, the institute aims to enhance students' practical skills, professional abilities, and innovation and entrepreneurship capabilities, to achieve seamless integration between talent cultivation and enterprise demands, to promote talent exchange and communication between schools and enterprises, and to build a "dual-qualified and dual-ability" teaching team. The Institute effectively carry out project cooperation and achievement transformation, and promote an effective balance between educational outcomes and service for the industry.

4.3 The Operational Practice of Digital Health Industry College

4.3.1 Inheriting the Integrated Development Model of "Industry-University-Research" and jointly Building a Demonstration Base for the Integration of Industry and Education

The integrated and collaborative development of Industry-University-Research has always been a prominent strength of Neusoft Education. It integrates the talent demands from the frontline of the group's industries and make an attempt in the process of talent cultivation and education. The sharing of resources and complementary advantages between industry and educational institutions could be beneficial for a win-win situation. Furthermore, deepening the integration of industry and education, and promoting precise alignment between industrial needs and talent supply are new requirements for higher education in the new era.

The construction and operation of the Neusoft Smart Health Industrial Park will further consolidate the new paradigm of Integration of Industry and Education centered on "IT + healthcare technology[6]." In collaboration with the Neusoft Healthcare Industry Alliance and other co-construction units, it aims to create a brand-new space integrating scientific research, teaching, experimental training, and industrial services. By leveraging the advantages of multiple entities and adopting various approaches such as inviting enterprises to school, inviting school to enterprises, and integrating schools and enterprises, the collegewill jointly build practical teaching bases and collaborative innovation platforms that cater to industrial development and innovation needs. It will drive the development of the college and industrial growth, to enhance students' professional skills, and foster innovation and entrepreneurship among students[7].

4.3.2 Building a High-Level "Dual-Qualified" Professional Teachers Team

As a link to promote the high-quality development of education and industry, modern industrial colleges focus on building a dual-qualified teaching staff in the construction, which is an important way to improve the quality of undergraduate education and promote the integration of production and education. Among the four majors of Health Medical Science and Technology College, intelligent medical engineering, health service and management are newly added to meet the needs of the development of the era. The development process is short, and the construction of professional connotation is still in the exploratory stage. It requires teachers to maintain closely interactions with industries and industries, to understand market demand instantly, to learn key technologies, to update knowledge systems, which can effectively ensure the quality of high-quality and compound talents training. The school implements the school-enterprise teacher interaction mechanism, encourages the strengthening of talent exchange and communication between schools and enterprises, and has successively issued guidance documents such as the "Part-time Teacher Management Measurements, "and "Qualification Certification Measures for Dual-Qualified Teachers" . Based on the professional characteristics, the industrial college innovates the talent circulation mechanism, adopts the identity mutual recognition system, and selects and trains "double-qualified" talents through the combination of "introducing enterprises into teaching" and "introducing schools into enterprises." On the one hand, excellent teachers are dispatched to enterprises to participate in project work. On the other hand, university encourage various majors to hire enterprise personnel as on-campus teaching and practice instructors, and implement the " dual-master " system of curriculum, student internship and dissertation. At present, the proportion of enterprise teachers in the School of Digital Health Industry

of Chengdu Neusoft University is 38 %, and the proportion of school teachers is 62 %. From the perspective of academic structure, the proportion of senior and deputy senior teachers in industrial colleges are 23 % and 18 % respectively. Schools and enterprises go in both directions to build a high-level professional teacher team, so as to lay a solid foundation for realizing the win-win situation of Integration of Industry and Education, collaborative education and innovative development.

4.3.3 Integrating Industry and Education, focusing on Cultivating High-Quality Composite Talents in the Field of "IT + Health Care"

Under the dual pressures of population aging and chronic disease prevention and control, the market for medical and healthcare services is undergoing significant transformations in terms of demand, service delivery methods, efficiency, and quality. As a result, the industry's need for healthcare professionals is gradually increasing, accompanied by stricter requirements for professional competencies. Chengdu Neusoft Digital Health Industry College, through closely collaborating with Neusoft Healthcare Alliance, industry associations, and other co-building entities, promptly grasps the needs of the industry and sector. Guided by the "TOPCARES Talent Cultivation Capability Indicator System" and "Ten-Step Methods for Revising and Formulating Talent Cultivation Plans," of the university, the college integrates industrial concepts, industry standards, and research findings on training specifications into its talent cultivation plan revision, Which are decomposed into three major indicators: knowledge, ability, and quality, focusing on nurturing high-quality, compound talents for "IT + healthcare technology". This attempt effectively addresses the disconnect between talent cultivation standards and social/industry needs, as well as the insufficient alignment with industrial and innovation chains.

The Industry College has successively launched customized training programs for talents in various health industry sectors, including medical information system development and maintenance, health checkups, smart healthcare, and sleeping quality improvement. During the talent cultivation process, a dual tutor system is implemented, where mentors from both the school and enterprise leverage their respective strengths to jointly cultivate talents.

At the same time, the college should strengthen communication and cooperation with industry associations, carry out the recognition of professional skill levels in areas such as health management and elderly capability assessment, and build a "1+X" education model which centered on the market's requirements for practitioners' knowledge, abilities, and qualities. This will enable teachers to effectively enhance students' professional skills and vocational competencies.

4.3.4 Integrating Science and Education, effectively Carrying out University-Enterprise Project Cooperation and Transforming Scientific Research Achievements

Focusing on the connotation construction and talent cultivation of the four majors in the college, as well as key issues such as product development and business processes in co-construction units, the school and enterprise collaborate to conduct scientific research on applied topics. Through the integration of science and education, we aim to practically address the problems faced by enterprises in their development and further promote the development and construction of major. The Digital Health Industry College fully integrates the laboratory conditions of the college's integrated health management, sports medicine, intelligent medicine, and other disciplines, along with the platform strengths of Neusoft Smart Health Industrial Park. Jointly with co-construction units, we establish a Biomedical Technology Innovation Research Center and Innovative Intelligent Medical Industry-University-Research Laboratory to carry out scientific research, which enable college to promote the transformation and application of scientific research achievements. Currently, the college has established research teams in areas such as Smart Healthcare, AI+New Drug Development, and Sleep Health Research. Based on Smart Healthcare research, the college have successfully declared two Sichuan Provincial Natural Science Foundation projects. Horizontal projects and research experiments focusing on sleeping health and sleeping quality improvement have also been carried out successively. In the future, we will further collaborate with partner enterprises and hospitals to conduct technology research, product development, achievement transformation, and project

incubation. We will share research results, enhance our ability to serve the industry, and improve the quality of applied talent cultivation.

5. Conclusion

Modern industry colleges serve as crucial practical platforms for cultivating application-oriented, interdisciplinary, and innovative talents who are grounded in the present and geared towards the future [8]. Under the background of the full implementation of the Healthy China strategic plan, the accelerating process of an aging society, and the construction of new medical disciplines, exploring the construction path of modern industry colleges that serve the healthcare industry and nurturing high-quality, strongly applicable, and precisely aligned healthcare talents to meet the needs of the industry and enterprises is of great significance. Through continuously exploration, it would not only promote the overall health level and health literacy of the public, the overall health service capacity of society could be promoted, people's health service needs would be meet, and sense of happiness and fulfillment could be achieved, but also it could significantly advance the realization of the "Healthy China 2030" strategic plan.

The Digital Health Industry College of Chengdu Neusoft University will continually optimize its operational mechanisms. From the perspectives of joint talent cultivation, teacher-staff interaction, scientific research cooperation, and achievement transformation, it will deepen the integration of industry and education, as well as the integration of medicine and education. It could make contributions to the interaction between education and medicine, the interoperability between healthcare and education, and the mutual sharing of medical care and elderly care, thereby a unique new ecosystem of integrated and harmonious development among education, medicine, and elderly care could be constructed. Through doing these the Digital Health Industry College will continuously enhance its social influence.

References

- [1] Several Opinions of The General Office of the State Council on Deepening the Integration of Industry and Education (No. 95, 2017) [EB/OL]. https://www.gov.cn/zhengce/content/2017-12/19/content_5248564.htm. (2017-12-19).
- [2] Guide for the Construction of Modern Industry College (Trial) [J]. Education Science Forum, 2020 (27): 6-9.
- [3] Xiao Fugang, Shu Penghua, Sun Juntao, Wang German, Zhang Yongqing. Research on the Construction and Practice Path of Modern Industrial College under the background of new Engineering [J]. Modern educational equipment in China. 2024(07): 75-78.
- [4] Nie Wei. The theoretical cognition and practice of the School of Industry [J]. Vocational Education Forum, 2021, 37 (9): 26-30.
- [5] Zhang Haolan. Exploring a new path to improve the quality and transformation of the Open University in the New Era: Promoting the integration and interactive development of industry and education through industrial colleges [J]. New Curriculum Research, 2022 (27): 9-12.
- [6] Entering Neusoft Education: the digital exploration of the pioneer of Integration of Industry and Education [EB/OL]. <https://www.163.com/dy/article/IA6SCRPA0519DDQ2.html>.(2023-7-21).
- [7] Tian Fuzhong, Li Jianqi, Wang Yilei. Exploration and Practice of the Construction of Industrial College—Taking Shandong University of Health Industry College as an example [J]. Journal of Heze University, 2022, 44 (5): 139-142.
- [8] Yin Hui, Su Zhigang. Development and thinking of Domestic Modern Industry College: connotation mode collaborative mechanism innovation [J]. Science and Technology of Chinese Universities, 2021 (11): 74-78.