Exploration of the Training Path for Applied Innovation Talents Based on the Integration of Industry and Education

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Abstract. Cultivating application-oriented innovative talents is an objective requirement for enhancing the core competitiveness of industries and gathering new driving forces for development. The integration of industry and education is a strategic choice for cultivating applied innovative talents. It is necessary to optimize the structure of disciplines and majors, reconstruct talent training plans, jointly cultivate talents between schools and enterprises, jointly build teaching and research platforms, create a "dual teacher" team, and improve institutional mechanisms.

Keywords: Integration of industry and education; Applied innovative talents; path

1 Introduction

With the rapid development of technology and the deep transformation of industries, the demand for applied talents in society is increasing day by day. The integration of industry and education, as a new type of education model, aims to cultivate high-quality talents with innovative spirit and practical ability through deep integration of industry and education. Therefore, exploring the cultivation path of applied innovative talents based on the integration of industry and education has important practical significance and long-term development value. There are some prominent problems in the current cultivation of applied innovation talents: firstly, the comprehensive quality of talent output is not high, the social adaptability is not strong, and it is difficult to meet the needs of industry and enterprise innovation driven development; Secondly, the talent cultivation mechanism is not sound, including unscientific subject and major settings, incomplete curriculum and textbook systems, and problematic evaluation systems; The third issue is that the talent cultivation model is outdated, and there still exists a problem of valuing knowledge over ability, and valuing theory over practice. Currently, facing the new requirements of high-quality development, universities and enterprises should firmly grasp the "bull's nose" of industry education integration, and improve the level of industry education integration at a higher level and in a wider field. For universities, it is necessary to optimize the setting of disciplines and majors, and build a discipline

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and professional chain guided by the industrial chain and innovation chain; To deepen the reform of talent cultivation mode, promote the joint formulation of talent cultivation plans by schools and enterprises, jointly build theoretical and practical courses, jointly build teaching and research base platforms, jointly implement quality and effect assessment and evaluation, and jointly build a "dual teacher" talent team, in short, it is necessary to continuously improve the quality of applied innovation talent cultivation by building a "community with a shared future" of industry education integration.

2 The Problems in Cultivating Applied Innovative Talents in Universities

2.1 The Comprehensive Strength of Applied Innovative Talents Needs to be Enhanced

One is that the knowledge structure needs to be optimized. The reality is that talents lack solid professional and basic knowledge, lack innovative thinking, and are not sensitive to new problems, new fields, and new technologies on the front line of production management services [1]. The second is that the ability structure needs to be optimized. At present, the talent ability structure is unreasonable, the practical operation ability is not strong, and the high-level invention and technological innovation ability needs to be improved. Thirdly, the quality structure needs to be optimized. At present, there are still a considerable number of talents who, based on research-oriented innovative talents, bury themselves in writing papers in front of computers, conduct experiments in laboratories [2], and do not actively enter society or practice. The quality of scientific research results is not high, disconnected from market demand, and there is a serious lack of technical achievements that can be applied to production practice.

2.2 The Mechanism for Cultivating Applied Innovative Talents Needs to be Improved

One is that the talent training program is not perfect. For example, the disciplinary and professional settings are disconnected from social needs, do not match the professional knowledge and skill requirements of social positions, the curriculum structure is unreasonable, especially the quantity and quality of practical courses, characteristic courses, and cutting-edge courses are small, the teaching materials and methods are outdated, and students have a weak sense of achievement. The second is that the support system for talent cultivation is not perfect. The measures to effectively gather high-quality resources from government, industry, academia, and research, and to adopt the path of open and cooperative education are not practical enough. Some schools blindly copy and absorb foreign training models without digesting them, failing to achieve the goal of absorption and reference. At the same time, the effective mechanism of industry education integration and school enterprise cooperation is not sound, and the depth and breadth of cooperative development are not enough. The mechanism for effectively gathering high-level scientific research resources both inside and outside the school,

and promoting the effective integration of scientific research resources with education and teaching, is not yet perfect. The third issue is the imperfect talent evaluation mechanism [3]. The current evaluation methods still tend to focus solely on academic qualifications and academic papers, and third-party evaluations from society are still weak. There is a lack of authoritative and unified standards for identifying applied innovative talents.

2.3 The Methods and Paths for Cultivating Applied Innovative Talents Need to be Innovated

The talent cultivation model in universities has gradually attracted attention with the increasing demands of society for talent abilities and levels. However, in the current work of talent cultivation in many universities, the cultivation model for applied innovative talents still largely follows the traditional talent cultivation model, with narrow ideas, outdated models, single methods, and a lack of systematicity and orderliness. Emphasizing the education of main channels over management services, emphasizing theoretical indoctrination over practical application, emphasizing knowledge reserves over ability cultivation, emphasizing professional education over comprehensive development, neglecting the systematic cultivation of talents, especially the stimulation of innovative thinking and the cultivation of innovative abilities, resulting in the inability of trained individuals to adapt well to the needs of society and the market. In addition, the quality of innovation and entrepreneurship education is not high, and students have a weak sense of achievement, which does not match the requirements of high-quality economic development. The following figure 1 shows a random survey of innovation and entrepreneurship education in a university in the western region.

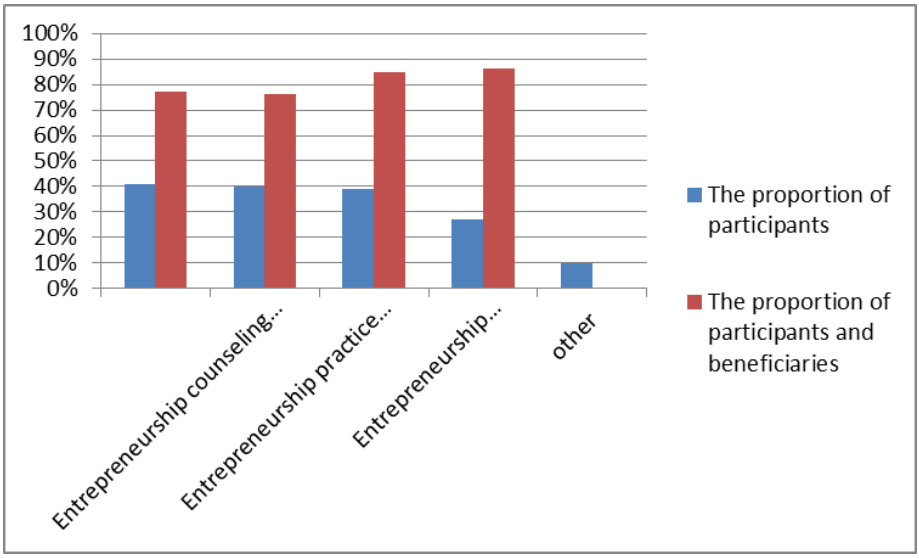

Fig. 1. Evaluation of Innovation and Entrepreneurship Education in a Certain University [4]

3 Integration of Industry and Education: A Strategic Choice for Cultivating Applied Innovation Talents

The General Office of the State Council's Several Opinions on Deepening the Integration of Industry and Education points out that "deepening the integration of industry and education, promoting the organic connection between the education chain, talent chain, industry chain, and innovation chain.". The reason why industry education integration is a strategic choice for cultivating applied innovation talents is that the parties involved in industry education integration are not only a community of real interests, but also a community of shared destiny for future development. For enterprises, only by enhancing their independent innovation capabilities can they continuously improve the technological content of their products and services, and stand invincible in fierce market competition. The enhancement of independent innovation capability relies on education as the foundation for key talents. Therefore, the development of enterprises fundamentally depends on the cultivation of applied innovation talents in universities. In the establishment of talent cultivation mechanisms, universities focus on the needs of enterprises, with the goal of cultivating professional talents that match the positions of enterprises, cultivating applied innovative talents, and achieving innovation driven development in university services [5]. In the cultivation of applied innovation talents, it is not only possible to complete it on campus, but also requires the resources and strength of industry enterprises. For the government, it should be the promoter, coordinator, and service provider of the integration of industry and education. It should use necessary economic, legal, and policy measures to promote the deep integration of industry and education, and release the powerful energy of industry and education integration. Currently, due to the unsmooth institutional mechanisms, resources and innovative elements for talent cultivation are held in the hands of different entities. Large innovation teams and abundant innovation resources such as higher education institutions, research institutes, and industry enterprises still face problems such as self-contained systems, scattered repetition, and low efficiency. There is a common problem of weak correlation with other main departments in the education mechanism of universities, and a lack of effective linkage mechanisms and activities with other scientific research institutes, enterprises, governments and other departments. Although some universities have established connections with the above departments in some majors to jointly carry out production experiments, the overall linkage model level is relatively low and the interaction is shallow, which restricts the cultivation of innovative talents in universities. Therefore, it is urgent to deepen the integration of industry and education in order to improve the quality of cultivating applied innovation talents.

4 A Path for Cultivating Applied Innovative Talents in Universities Based on the Integration of Industry and Education

4.1 Optimize the Structure of Disciplines and Majors

Based on the perspective of integration of industry and education, the setting of disciplines and majors should be achieved through dynamic adjustment of disciplines and majors in open education, in accordance with the needs of both industry and education, and to achieve the adaptation and matching of talent training supply side and industry demand side in terms of structure, quality, and level [6]. When optimizing the professional structure, universities should focus on the applicability of disciplines, and aim to promote the upgrading of industrial structure in the construction of disciplines and majors. In combination with the needs of industry development, universities should practice the joint construction of disciplines and majors between schools and enterprises. By enhancing the discourse power of enterprises in disciplinary construction and talent cultivation, we can strengthen the connection between specialties and industries. And in the construction, attention should be paid to the cluster construction of disciplines and majors. The construction goal should deepen the influence of the development directions of service strategy and emerging industry cluster construction to meet the improvement of students' comprehensive abilities, development, and competitiveness. In the construction of disciplines, professional guidance committees can also be jointly established with industry enterprises to ensure the matching degree between the professionalization of discipline construction and the needs of social development, and to build a school's characteristic professional group.

4.2 Reconstruct Talent Training Programs

In the cultivation of applied innovation talents, the first step is to determine the training objectives. Universities should take the ability to connect with the needs of enterprises and meet the basic needs of the industry as the talent training benchmark, and cultivate students with high professional ability, strong adaptability, and innovative consciousness as the training direction of applied innovation talents. In the formulation of specific training plans, the idea of integrating industry and education should be based on, and industry scholars and corresponding enterprise experts should jointly develop training plans. They should participate in the entire process of plan research, argumentation, and revision, and absorb the opinions of industry and enterprise experts based on specific job requirements to construct talent training plans based on positions, abilities, and courses. In the construction of the plan, attention should also be paid to the following points. Firstly, it is necessary to ensure that the curriculum system meets the job requirements and that talents have the ability to match their majors [7]; Secondly, it is necessary to reasonably match theoretical courses with practical courses to ensure that students have sufficient theoretical foundation and strong practical abilities; Thirdly, in the cultivation of professional abilities, vocational education should also be combined to promote the comprehensive development of students' work abilities and professional

qualities; Fourthly, deepen the educational strategy of integrating industry and education, actively integrate engineering and learning in the teaching process, achieve a talent cultivation strategy of school enterprise cooperation, and promote students' engineering awareness and innovation ability.

4.3 Joint Training of Talents Between Schools and Enterprises

In implementing the education model of integrating industry and education, the participation of industry enterprises in education is very important. Therefore, it is necessary to establish diversified school enterprise cooperation models to promote the reform of talent cultivation models [8]. For example, schools and enterprises can collaborate to establish talent cultivation experimental classes, achieve a collaborative teaching method of theoretical research and practical participation, and cultivate students' practical and innovative abilities. In the course design, it is also necessary to coordinate the application of enterprise professional teaching system, establish a collaborative teaching expert database, and invite corresponding in-service talents to take on some teaching work based on specific majors and corresponding positions. The latest technology and market-oriented industry awareness should be introduced into the classroom, creating a good environment for students to be close to the industry, enterprises, and the latest technology, effectively improving their engineering practice ability and innovation and entrepreneurship ability. Universities can also apply a diverse mentorship system, consisting of multiple roles such as teachers, enterprise experts, and job leaders to form a mentorship team, achieving a cross training and guidance model of one-on-one and many to one between students and mentors, and jointly applying for and conducting various research projects [9]. Ultimately, in school enterprise cooperation, practical cases are used to enhance students' professional perspectives, practical operations to enhance their professional abilities, and the integration of industry and education to enhance their comprehensive abilities is achieved.

4.4 Co Build a Teaching and Research Platform

Universities should build national and provincial engineering practice education centers and off campus internship practice bases based on their professional characteristics, and encourage students to participate in enterprise production and operation activities [10]. At the same time, universities should also cooperate with industry enterprises to create an on campus practical teaching platform, and assign the platform to various teaching teams for management. Excellent students can also be selected to assist in management, research, and participate in the construction of practical training bases. In the integrated mode of industry and education, students can participate in scientific research projects and experimental development in the base, and can also rely on the platform to carry out activities such as curriculum reform, engineering internships, graduation projects, and technological innovation [11]. Universities can introduce measures to promote eligible students to enter platforms, teams, and projects. Each research platform can also open up a certain number of experimental assistant positions, providing students with

the opportunity to participate in project research, achieving a healthy development of "integration of teaching and research, mutual benefit".

4.5 Build a "Dual Teacher" Team

Universities can create opportunities for teachers to participate in corporate training and practice by implementing projects such as teacher teaching ability enhancement and higher engineering (management) entry into schools. Universities can also collaborate with enterprises to build and share talents, achieving complementary advantages, deep integration, and multi-party win-win. Universities can hire senior engineering and technical personnel from enterprises as part-time professors, or proactively hire full-time and part-time teachers with on-site work experience to guide and participate in laboratory construction and practical teaching [12]. Universities also send technology envoys to enterprises for joint research and development, deepening cooperation with enterprises.

4.6 Improve Institutional Mechanisms

One is to establish a system of integrating industry and education. Establish a long-term cooperation mechanism for the integration of industry and education, improve the management team, and carry out systematic reforms in scientific research management, talent evaluation, subject teaching, and other aspects to ensure the standardized operation of industry and education integration. The second is to establish a funding guarantee mechanism for the integration of industry and education. Actively implement the funding investment of the government, enterprises, and universities themselves, actively strive for socialized financing, establish diversified, stable and sustainable funding sources, and continuously standardize fund management. The third is to establish a mechanism for ensuring the distribution of benefits through the integration of industry and education. The parties involved in the integration of industry and education should sign cooperation agreements, clarifying their responsibilities, rights, and obligations, planning and progress of cooperation, and distributing benefits based on the basic principles of "sharing benefits and risks". The main standards should be based on the responsibilities and risks undertaken, and supporting responsibility and risk assessment institutions should be established to timely make relevant risk assessments.

5 Conclusion

The integration of industry and education is of great significance in improving the quality of talent cultivation, alleviating the contradiction between talent supply and demand structure, stimulating students' innovative spirit and practical ability, promoting the professional development of teachers, and enhancing the social service capacity of universities.To promote the cultivation of applied innovative talents through the integration of industry and education, it is required to establish a close school enterprise cooperation relationship, improve the talent training mode and curriculum system,

strengthen the construction of the teaching staff, establish an integrated practical teaching system of industry, academia, research and application, build an innovation and entrepreneurship platform, improve the evaluation and feedback mechanism, and improve the quality of talent training and social adaptability.

Reference

1. Lu Huan. Innovative Research on the Cultivation Path of Innovative and Entrepreneurial Talents through the Deep Integration of Industry and Education in Applied Universities [J]. Industrial Innovation Research, 2023, (24): 177-179
2. Li Xijie. Talent Training Path for Applied Undergraduate Universities Based on the Integration of Industry and Education in the Perspective of High Quality Development [J]. Sichuan Labor Security, 2023, (11): 28-29
3. Dai Daqi. Connotation and Practice Path of Integrated Curriculum Construction for Applied Talent Cultivation [J]. Journal of Beijing United University, 2023,37 (05): 30-35+55. DOI: 10.16255/j.cnki. ldxbz. 2023.05.005
4. Cui Qingyu. Exploration of Innovative Talent Training in Applied Local Universities [J]. Journal of Jiamusi Education College, 2014 (11): 75
5. Xin Liming. Research on the Cultivation of Applied Innovation Talents in Universities Based on the Integration of Industry and Education [J]. Public Relations World, 2021, (08): 44-46
6. Wang Ye. Research on the Training Path of Applied Talents in Local Undergraduate Universities Based on the Integration of Industry and Education [J]. Journal of Inner Mongolia University of Finance and Economics, 2022, 20 (04): 55-58. DOI: 10.13895/j.cnki. jimufe.2022-04.030
7. Zhu Ji, Yu Shuhui, Zhang Hongjuan. Exploration of the Concept of Cultivating Applied Innovation and Entrepreneurship Talents in Undergraduate Universities [J]. Journal of Hebei University of Geosciences, 2023,46 (06): 135-139. DOI: 10.13937/j.cnki. hbdzdxxb. 2023.06.019
8. Wang Shanshan, Wu Jingjing. Research on the Reform of the Training Model for Applied Innovation Talents in Universities Based on the Collaborative Education Concept of "Industry University Research Application" [J]. Research and Practice of Innovation and Entrepreneurship Theory, 2023,6 (20): 113-115+123
9. Nash, John. In Journal of Research on Leadership Education. Dec 2011 6(5):181-194.
10. Rybakova, M. V. Russian Education & Society. Mar2008, Vol. 50 Issue 3, p25-34. 10p. 1 Chart, 1 Graph. DOI: 10.2753/RES1060-9393500302.
11. Xia Suxia. Reflections on the Path of Cultivating Applied Innovation Talents for Undergraduate Education in Universities [J]. Beijing Education (Higher Education), 2023, (07): 65-67
12. Xie Xiaojun, Xue Shenfang, Fu Miaomiao. Research and Practice on Innovative Talent Training Models in Applied Undergraduate Universities [J]. Cai Zhi, 2023, (19): 149-152