

The Integration of Industry and Education and the Integration of Science and Education in the Perspective of Collaborative Governance to Assist Education Research

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Abstract: In order to solve the current problems faced by China's education sector, such as the separation of industry and education, and the disconnection between science and education, this paper analyses the integration of industry and education and the fusion of science and education under the perspective of collaborative governance. First of all, this paper discusses the implementation status quo of industry-education integration under the support of policy, the role of enterprises in talent cultivation and how to establish a synergistic mechanism between colleges and universities and industries. On this basis, the paper analyses the path choice of science-education integration, the deep integration mode driven by innovation, and its positive impact on improving education quality and competitiveness. Finally, this paper proposes strategies to promote the integration of industry and education with the integration of science and education, hoping to provide some references for building a strong educational country.

1. Introduction

In the context of globalisation, the role of education is becoming more and more prominent and has become the key to national soft power and core competitiveness. With the rapid development of economy and society, the traditional education mode has been difficult to meet the needs of modern industry. The integration of industry and education and the fusion of science and education have arisen and are regarded as an important direction of educational innovation. Within the framework of collaborative governance, innovation and development in the field of education are imperative by breaking down industry barriers and realising the combination of industry, academia, research and application. In this context, the quality and efficiency of education will continue to improve, providing a strong guarantee for the cultivation of high-quality talents adapted to the needs of the new era.

2. Practice and Challenges of Industry-Education Integration

2.1 State policy support and implementation status of integration of industry and education

As an important strategy to promote the deep integration of education and economic development, the integration of industry and education has been widely supported by national policies. The government has successively issued a series of policy documents, clearly proposing to strengthen the co-operation between industry, universities and research institutes, and to promote the deep docking between higher education and industry, aiming to cultivate high-skilled talents in line with the market demand [1]. Under the guidance of this policy, regions and industries have responded positively, and the practical activities of industry-university integration are increasing day by day. With regard to the implementation status quo, institutions of higher education and enterprises have established a variety of cooperation modes, such as industry-academia-research co-operation and joint cultivation between schools and enterprises. These co-operations involve various levels such as curriculum co-construction, mutual assignment of teachers, and sharing of internship and training bases. Especially in some economically developed regions, the integration of industry and education has shown a more active trend, and a number of outstanding cases leading the development of the industry have emerged. Nevertheless, the integration of industry and education still faces a series of challenges in the process of implementation. Problems such as imprecise matching of needs and insufficient innovation in the content and mode of co-operation are often found in the co-operation between colleges and enterprises. In addition, the depth and breadth of the integration of industry and education in some regions are insufficient, and there is the problem of unbalanced geographical development. The mismatch between educational resources and industrial development has also become a bottleneck affecting the in-depth development of industry-education integration. Overall, the integration of industry and education has made positive progress under the vigorous promotion of national policies, but it is still necessary to face the challenges at the implementation level, actively explore innovative cooperation mechanisms, and realise the effective docking of educational resources and industrial demand.

2.2 Enterprise participation and role change in the integration of industry and education

In the process of integration of industry and education, enterprises play an increasingly important role. Under the traditional perspective, enterprises, as recipients of education, only play a role in the final stage of transforming education results into productivity. However, with the deepening of the integration of industry and education, the role of enterprises has changed from a single stakeholder to a participant, and even a co-operator and promoter of the education process [2]. Enterprises not only provide internship and training bases, but also optimise the talent cultivation mode by participating in curriculum design, teacher training and teaching materials writing. Specifically at the operational level of enterprise participation, some pioneering enterprises have begun to participate in students' curriculum learning, project research, skills training, etc. By customising professional courses and providing problem-oriented practical projects, they help students better understand and master the professional knowledge and practical skills required by the industry. In their participation, enterprises also provide timely feedback on their needs and development trends to the partner institutions to guide the updating of education content and ensure the synchronisation of education outcomes with market demands. With the changing role of enterprises in the education and training process, some challenges have emerged. How to balance the interests of enterprises with the fairness of education, ensure the independence and scientificity of education content, and how to ensure the rights and interests of students in practice have become urgent issues. In addition, how to effectively dock between the demand of enterprises for educational resources and the supply

of educational resources in universities is also an important indicator to test the effectiveness of the integration of industry and education. Based on this, enterprises in the process of industry-education integration should not only actively invest resources to promote the combination of educational content and practice, but also need to continuously explore new modes of cooperation with universities to achieve win-win situation for both sides. At the same time, government departments need to provide guidance and support for enterprises to participate in the integration of industry and education from the policy level to ensure the legitimacy, effectiveness and sustainability of cooperation.

2.3 Construction of university-industry synergy mechanism

Constructing an effective synergy mechanism between universities and industries is the key to realising the integration of industry and education. The core of the synergistic mechanism is to build a two-way interactive and common development platform to ensure a high degree of consistency and interaction between education and industrial needs. For one thing, a clear framework for cooperation needs to be established to clarify the responsibilities, rights and distribution of benefits between the two parties, which is the basis for solid long-term cooperation. At the operational level, universities and enterprises can jointly set up industry-university-research bases to share resources and complement each other's capabilities through joint R&D projects and transformation of achievements. Second, the introduction of market mechanisms, through project commissioning, order training and other modes, so that the education services directly to the market demand, to enhance the relevance and effectiveness of education. Third, universities and industries also need to work together to establish a long-term information exchange and feedback mechanism. Through regular seminars, forums and other activities, both sides can exchange the latest education dynamics and market demand, and adjust education plans and training programmes in a timely manner. At the same time, a sound evaluation system should be set up to quantitatively assess the results of the cooperation, so as to provide a basis for subsequent adjustment and optimisation. Fourth, in the face of the ever-changing market changes, the synergy mechanism also needs to have a certain degree of flexibility and adaptability. Universities and industries should encourage innovative thinking, and constantly explore and try new modes of cooperation to respond to the needs of technological progress and industrial upgrading.

To sum up, the construction of university-industry synergy mechanism requires both parties to seek deeper interaction and cooperation while maintaining their independence, to establish a long-term cooperative relationship that meets the interests of both parties, and to jointly promote the integration of industry and education to deeper development. The government plays an important role in this process and should provide the necessary policy support and supervision to ensure the effective implementation and healthy development of the synergy mechanism.

3. The path and impact of science and education integration

3.1 Policy guidance and path exploration of science and education integration

Science and education integration refers to the in-depth integration of scientific research and education teaching, aiming at promoting education innovation through scientific research and promoting the development of science and technology with educational achievements. Policy guidance plays a crucial role in the integration of science and education, which involves planning the rational allocation of scientific research and educational resources, and ensuring the synergy between the two in terms of goals and practices [3]. Specifically: first, the strategic position of science and education integration is clarified, and the concept of science and education integration

is incorporated into the overall national development plan through top-level design. On this basis, specific implementation programmes and support policies are formulated, covering various aspects such as capital investment, tax exemption, talent introduction, etc., in order to ensure the mutual benefit of scientific research and education. Secondly, in terms of path exploration, various modes can be adopted to promote the integration of science and education. The first is to establish a mechanism for transforming scientific research results into educational resources, encouraging universities and research institutes to incorporate the latest scientific research results into their teaching content, updating their curriculum systems, and improving the quality of teaching and the practical ability of students. Thirdly, school-enterprise co-operation should be promoted to allow enterprises to participate in the education process, introduce practical problems into the classroom and enhance students' ability to solve practical problems. Fourth, policies should support the development of interdisciplinary research and learning programmes, break down traditional disciplinary boundaries, build an open platform for academic exchanges, and promote the integration of knowledge and complementary skills among different disciplines. It is also necessary to promote reforms in higher education institutions to strengthen the research-oriented teaching mode, so that students can learn and grow in the process of participating in research projects. Fifthly, in order to deepen the integration of science and education, it is necessary to strengthen the development of the teaching force. Therefore, the policy should provide continuous professional development opportunities for teachers, encourage them to participate in scientific research projects, and enhance their scientific research capability so that they can better transform the results of scientific research into teaching content. Sixth, in terms of impact, the integration of science and education will greatly facilitate the cultivation of innovative talents. By participating in scientific research projects, students will be able to exercise their thinking ability and practical skills in the process of solving complex problems, thus contributing to the scientific and technological progress and economic development of the society. At the same time, the integration of science and education will also enhance the adaptability and flexibility of education, making it closer to the needs of social and industrial development. In addition, the integration of science and education can also promote the close integration of scientific research and social needs, accelerate the socialisation and marketisation process of scientific research results, and promote the integration of scientific and technological innovation and economic and social development.

3.2 Deep Integration of Innovation Drive and Science and Education Integration

Innovation drive is the core driving force for the development of countries around the world, and the integration of science and education provides a steady stream of intellectual support and talent guarantee for innovation drive. The realisation of deep integration requires that the education system and scientific research institutions achieve a seamless connection in terms of goal-setting, resource allocation and transformation of results. Specifically: for one thing, higher education institutions need to adjust their professional settings and curriculum content in accordance with the national innovation development strategy to ensure that the content of education is in sync with the frontiers of science and technology. The curricula should include innovative theories and practical operations to cultivate students' innovative thinking and practical abilities. Close cooperation between research institutions and universities can provide students with practical platforms such as laboratories and research projects to enhance their research experience. Second, the transformation of scientific research results requires the participation of the education system. Educational institutions should establish a mechanism for the transformation of results and promote the application of scientific research results in the field of education, so as to achieve the dissemination of knowledge and the popularisation of technology. At the same time, the transformation of

scientific research results into the market can be accelerated through institutions such as innovation incubation centres and technology transfer offices both inside and outside the university. Thirdly, colleges and universities need to strengthen their ties with local governments and industries, and take the needs of regional economic development as the basis for targeted scientific research projects and talent training, so as to promote the deep integration of scientific and educational resources with the local economy. Through the form of industry-university-research-use consortiums and other forms, a good situation of school-local interaction and collaborative innovation has been formed. Fourth, innovation drive also needs to rely on a high-quality education system. The education system should continuously optimise the quality of education, improve the scientific research level and teaching ability of the teaching staff, and build a broader knowledge platform and innovative practice places for students. In terms of talent cultivation, it should focus on cultivating students' innovative spirit and cross-border ability, so as to cultivate more high-quality talents with international vision and innovative ability for the society.

3.3 Impact of science and education integration on education quality and national competitiveness

The integration of science and education has a far-reaching impact on the improvement of education quality. By transforming scientific research results into educational content in a timely manner, the education system can constantly update its knowledge structure and keep pace with the development of science and technology. While receiving the guidance of the latest scientific theories, students can also participate in actual scientific research projects and enhance the ability to combine theory and practice, thus significantly improving the effectiveness and foresight of education [4]. In addition, the integration of science and education plays a key role in cultivating innovative talents. Education not only teaches knowledge, but also pays more attention to stimulating students' innovative consciousness and creativity, and delivers high-quality talents who can lead innovation and drive development for the society. This mode of cultivating talents helps students form the habit of lifelong learning and adapt to the rapidly changing working environment and life needs. The enhancement of national competitiveness cannot be achieved without the double-wheel drive of scientific and technological innovation and educational progress. By optimising the talent cultivation mechanism, Science and Education Fusion enables educational output to better serve national strategic needs and provide intellectual support for economic and social development. A country with a high-quality education system and strong scientific research strength can maintain its leading position in global competition and seize the high ground in scientific and technological innovation. The integration of science and education also promotes the close integration of scientific research with social needs. The flexibility and adaptability of the education system have been strengthened, enabling it to respond quickly to changes in economic restructuring and industrial upgrading, and promoting the application of scientific research results in a wider range of fields. This innovation mechanism rooted in the combination of education and scientific research has injected a strong impetus for the sustainable development of the national economy.

4. Conclusion

By analysing the practices and challenges of the integration of industry and education and the integration of science and education in the perspective of collaborative governance, this paper concludes that the integration of industry and education and the integration of science and education are of great significance in promoting education reform and enhancing the competitiveness of national education. Through policy support, enterprise participation and the construction of

synergistic mechanisms between universities and industries, the integration of industry and education has achieved initial results. Meanwhile, the integration of science and education has shown strong vitality under the drive of innovation, which has a significant impact on improving the quality of education and accelerating the transformation of scientific research results. In the future, the practice of industry-education integration and science-education integration should be further deepened, relevant policies should be improved, and a long-term mechanism should be established, so as to promote the construction of a strong educational country and inject a steady stream of talents and intellectual support for the sustainable development of the country.

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