

Exploration of the model of deepen industry–education integration in the digital economy era

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Abstract

Purpose – While the industry–education integration has achieved significant results, it also faces many prominent problems. The current problems include some projects prioritizing research and development over education, insufficient breadth and depth of cooperation and a lack of quality monitoring and evaluation mechanisms. Breaking through these problems to deepen industry–education integration is an important issue that urgently needs to be studied.

Design/methodology/approach – Taking the second batch of 10,283 industry–education integration projects of the Ministry of Education in 2019 as a case study, the problems existing in the Chinese industry–education integration projects are analyzed. We should make full use of the advantages and resources in the era of digital economy to seek the right path to deepen the integration of industry–education.

Findings – The study finds that governments can leverage the advantages and opportunities of the digital economy to deepen the reform of industry–education integration.

Originality/value – The policy suggestion is to deepen the mechanism of multi-party linkage and collaborative education, actively build an industry–education integration service platform and promote the two-way docking of industry education supply and demand.

Keywords Deep integration, Digital economy era, Industry–education integration

Paper type Research paper

1. Introduction

From 2014 to 2017, China has continuously issued multiple policies on the development of industry-education integration, gradually expanding the scope of industry–education integration from vocational education institutions to ordinary undergraduate institutions and “first-rate universities and disciplines” and ultimately determining it as the guiding principle for all types of universities nationwide.

After nearly a decade of development, the industry–education integration has achieved gratifying results in coordinating the development pattern, innovating the mechanism of school enterprise cooperation in running schools, two-way connection between supply and demand and improving the policy support system for the industry–education integration. However, compared with the Chinese policy goals, what are the prominent problems that the industry–education integration still faces in the promotion process? How to break through

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these problems to promote the deepening and implementation is an important issue that urgently needs to be studied. By the end of 2022, China's digital economy had reached 50.2 tri yuan, ranking the second largest in the world, according to the National Bureau of Statistics. The continuous development of the scale and structure of the digital economy has impacted the traditional industrial ecosystem and also profoundly affected the mode of talent cultivation. It is particularly urgent and important to study the deepening of the mode of industry–education integration under the background of the internet economy.

2. The literature review

The research on the industry-education integration in China mainly focuses on the connotation and characteristics, organization and system, mode and path, difficulties and causes of the industry–education integration. At the same time, some studies also pay attention to the influence of urban development level on the integration of industry and education. In recent years, there has been a growing consensus in the academic community regarding the importance of the industry–education integration mechanism in talent cultivation and industrial development. [Tang *et al.* \(2018\)](#) used case studies to explore the mechanisms of “government-school-enterprise” construction, industry–education integration mechanisms and “dual subject” education. And the studies believed that only by continuously deepening the concept of industry–education integration can we achieve true collaborative education. With the rapid development of the internet economy, a large number of case studies began to focus on the reform path of industry–education integration in the internet economy era. [Xiang and Chen \(2020\)](#) used the “three-dimensional analysis framework of industry-education integration composed of connectivity, interactivity, and network effects” to study the Alibaba Business School ITPD project. The research suggests that the essence of industry education integration lies in leveraging the advancement of network technology to establish effective industry academia interaction, including achieving intelligent teaching processes in specific scenarios, thereby forming a mutually feedback talent cultivation network.

3. The problems faced by the deep industry–education integration development

3.1 Goal deviation: some projects prioritize research and development over education

The industry–education integration aims to integrate high-quality industrial resources, optimize the structure of talent cultivation and improve the quality of talent cultivation, with the fundamental goal of educating people. At present, there are still some projects that prioritize technological innovation as their ultimate goal and are enthusiastic about school enterprise cooperation in technology research, product development and achievement transformation. They have not timely fed back scientific research to talent cultivation and the goal of industry–education integration has not focused on education. Among the second batch of 10,283 industry–education integration education projects of the Ministry of Education in 2019, about 1, 8 teacher training projects accounted for 18%, and 669 outstanding engineering talent projects accounted for only 6%. Obviously, the proportion of talent training and teacher training projects closely related to education is not large. This situation reflects the utilitarian orientation of enterprises, because focusing on talent cultivation makes it difficult and slow to make profits, while focusing on technological innovation makes it easy and fast to make profits. The Chinese policy clearly points out that the main goal of deepening the industry–education integration is to gradually increase the participation of industry

enterprises in education, improve the diversified education system and comprehensively promote collaborative education between schools and enterprises. The industry–education integration aims to comprehensively integrate the structural elements of the supply side of talent cultivation in the education system and the demand side of the industrial system, achieving the goal of cultivating a large number of high-quality innovative and technically skilled talents. Some industry–education integration projects have not focused on talent training, which has deviated from the original intention of vigorously promoting industry–education integration.

3.2 Insufficient depth: the breadth and depth of cooperation are not enough

Firstly, most industry–education integration projects are superficial collaborations. Among the second batch of 10,283 industry–education integration and collaborative education projects of the Ministry of Education in 2019, about 900 universities have docking projects, but the peak statistics of the participating projects are as high as 3.072. The number of undertaken projects is concentrated in a few universities, and the participation is relatively extensive but extremely uneven distribution. The main manifestation is that the industry–education integration projects have not formed a stable dual teacher team, a lack of integrated design between internship bases and campus teaching activities, a lack of a sound management system for school enterprise cooperation and a lack of a collaborative education model on industry–education integration. The main reason is that enterprises have not been able to obtain tangible benefits from the industry–education integration, and their participation enthusiasm is not high. In fact, the development of training programs, curriculum system design and textbook development in the industry–education integration projects are all led by universities and cooperated by enterprises, from which enterprises are almost unprofitable. The prerequisite for deepening the industry–education integration is that both schools and enterprises can benefit. Only through mutual benefit, joint construction and sharing can they both ensure long-term cooperation and deep integration. Schools in the industry–education integration is to utilize the high-quality resources and real work situations to carry out activities such as talent cultivation and the transformation of scientific and technological achievements. Talent cultivation is the primary responsibility of universities, not an important task for enterprises. Regardless of the type of enterprise, their fundamental motivation for cooperating with universities is for the development of the enterprise itself. Enterprises must ensure their economic benefits and output returns when investing in the industry–education integration. Therefore, the rational choice for enterprises in the industry–education integration is still to maximize profits by minimizing costs. The lack of profitability in enterprises inevitably leads to low enthusiasm, which is the fundamental reason why it is difficult to carry out deep-level cooperation between schools and enterprises.

The second issue is that the student coverage of the industry–education integration project is insufficient. The number of students covered by the industry–education integration project is limited, and the beneficiaries are narrow. In terms of cooperation areas, most industry–education integration projects mainly focus on a specific discipline and lack interdisciplinary and integrated cooperation. As a result, the benefits of students in the collaborative project are limited to a certain discipline and major, and the various high-quality resources of the enterprise have not benefited students in different disciplines and majors of the school. Statistics have found that there are currently almost no programs that can cover students at different levels of undergraduate, master’s and doctoral programs. Some projects only train undergraduate students without extending to graduate students or some research projects only involve graduate students and do not provide opportunities for

undergraduate students. The narrow scope of benefits reflects that the industry–education integration in universities has not been elevated to a higher education system. This is highlighted by the lack of specialized institutions in schools to promote industry–education integration. According to statistics, most universities spontaneously promote the industry–education integration by their departments. The industry–education integration projects promoted by departments may not be fully utilized due to the lack of top-level design and systematic planning at the school level, and the scope of benefits for teachers and students is limited to the department, with obvious limitations. Therefore, the lack of specialized institutions responsible for industry–education integration makes it difficult to systematize, scale and institutionalize the work of industry–education integration, and the benefits for students will inevitably be narrow.

3.3 Lack of evaluation: lack of quality monitoring and evaluation mechanism

To ensure the effectiveness of industry–education integration projects, there must be practical and feasible work standards and evaluation methods. Otherwise, both schools and enterprises are likely to follow their own ways during the cooperation process, making it difficult to produce the best results. Through quality management, it is possible to determine what the goals of the industry–education integration project are, what resources are needed in the cooperation process, how to effectively utilize these resources, whether both schools and enterprises have achieved mutual benefits through cooperation, and whether the cooperation effect has achieved the expected goals. If there is a gap between the results and the expected goals, it is necessary to adjust the plan timely to improve the project quality. In addition to quality monitoring and internal evaluation of the project implementation process, external evaluation of the project is also important. However, most projects have not invited relevant departments to conduct external evaluations of project effectiveness. This indicates that the industry–education integration may be considered as a matter between the implementing entities, and the project effectiveness, economic benefits and social impact have not been given sufficient attention. The direction of construction is to actively support third-party institutions in the evaluation of the effectiveness of industry–education integration, improve the statistical evaluation system and require the strengthening of the application of monitoring and evaluation results as an important basis for performance evaluation.

4. The advantages and opportunities of industry–education integration in the digital economy era

Currently, the digital economy has become a global development trend. In 2018, the proportion of the digital economy to GDP in the United States, Germany and the UK all reached or exceeded 60%. In the same year, China's total digital economy reached 31.3tn yuan, ranking second in the world but accounting for only 34.8%. With the implementation of “new infrastructure,” the potential of China's digital economy will be unlimited, and it will also lead to disruptive changes in social production methods. High-level and deep industry–education integration must adapt to the needs of digital economy development for talent cultivation standards. Therefore, new professions related to digital technologies such as artificial intelligence as well as the cultivation of innovative abilities closely related to them, will be the new goals that high-level and deep industry–education integration should refer to.

The digital economy is a new economic form that determines productivity through data information and its transmission technology (Pei *et al.*, 2018). In the process of integrating with the economic industry, digital technology can be used to guide and achieve optimal

allocation or regeneration of resources, thereby driving industrial transformation and high-quality economic development. The comprehensive infiltration of digital technology into human life will inevitably lead to systematic changes in individuals, organizations, countries and even human society and will also bring new opportunities for the industry–education integration.

4.1 The digital economy can break through the boundaries and constraints of traditional employment scenarios

As the digital economy develops, more and more new formats and business models have emerged. Employment in the digital economy is the whole process of applying digital technology to the identification of entrepreneurial opportunities, the improvement of entrepreneurial models and the optimization of business models. For example, the entrepreneurial behavior of obtaining “digital dividends” through the innovation of business models by integrating digital technology into different industries is a typical way of digital entrepreneurship. The current well-known retail websites such as Taobao and JD as well as “Tiktok Live,” are this model. This model can record customers’ product preferences and consumption habits for enterprises through big data technology, which can not only promote the accuracy of enterprises’ customer service but also create conditions for enterprises to expand market capacity. Digital technology enables information and resources to freely flow between industries without barriers, increasing connections and interactions between different industries and effectively shortening product design and market feedback cycles. Therefore, digital entrepreneurship can achieve “low threshold,” “high efficiency” and “flexibility,” and can also propose convenient and accurate solutions for complex social needs in a unique way. Under digital conditions, Internet celebrities gather a large number of fans through digital platforms and live streaming rooms. They aggregate fans and transform them into powerful purchasing power. This new form of commodity circulation has given birth to a unique internet celebrity economy. Therefore, digital technology has become a core element in controlling the quality of economic operation by transforming everything into digital form and has given rise to various entrepreneurial methods or new formats.

Digital technology reconstructs the external world and makes it difficult to predict and grasp the previously stable and controllable living environment of humanity. This uncertainty also participates in the reshaping of traditional entrepreneurial models, making entrepreneurial situations increasingly open and lacking boundaries, surpassing the scope of traditional entrepreneurial theories in universities. In short, digital technology has become a new driving force for entrepreneurship education in universities. It not only eliminates the traditional entrepreneurship education model based on physical time and space but also utilizes big data to expand the total amount of entrepreneurial knowledge and the boundaries of individual entrepreneurial cognition, which can activate new entrepreneurial thinking. Based on this, the social and economic changes caused by the development of digital technology will inevitably lead to a paradigm shift in entrepreneurship education.

4.2 The digital technology expands the composition of entrepreneurial education groups

Digital technology makes knowledge production no longer monopolistic but enables everyone to become a producer of knowledge. This “decentralized” knowledge production model enhances the sharing and connectivity of information, which can not only promote the flow and accumulation of social capital and provide possible space for mass entrepreneurship but also provide a combination of multiple elements such as technology, talent, funds, information and services for entrepreneurship, enhancing the richness of entrepreneurial resources. As a result, the digital economy enables people to no longer have a

single market identity but may become consumers, experiencers, evaluators or product innovators. People can quickly switch from one market identity to another, becoming the most endogenously driven entrepreneurs.

Firstly, the willingness of young people to participate in entrepreneurship will increase. Young people are more receptive to new things, such as digital technology, and are also more likely to use digital technology to form new ways of consumption, which creates conditions for young people to immerse themselves in new economic models and discover new business opportunities. Entrepreneurship has a strong practical and experiential cumulative effect. The earlier and more experienced the entrepreneurship, the stronger the sensitivity and the greater the entrepreneurial benefits. Young people in developed countries in Europe and America have been involved in entrepreneurial practices early and attach great importance to cultivating their own creativity, cognitive abilities and social and emotional skills. This trend has expanded with the widespread penetration of digital technology, and the trend of young entrepreneurs developing is very obvious. And economic research shows that the digital economy leads to the extension of entrepreneurial groups to women and the aged. Entrepreneurship education in universities must attach importance to this change.

4.3 The scope of entrepreneurship enables boundaryless entrepreneurship

Digital technology enables information dissemination to transcend traditional physical boundaries, making entrepreneurial behavior highly borderless and interactive. With the help of digital technology, entrepreneurs from all over the world can form cross-border entrepreneurial teams that are not limited by traditional physical spaces.

Products embedded with digital technology can go beyond traditional marketing methods and quickly spread at a low cost, greatly reducing the geographical space of the market. Based on this, the limitations of talent, culture and regional space on a global scale will no longer exist in the future. The change in traditional formats will inevitably lead to the formation of new global formats, and entrepreneurship will become an international trend. Especially in developing countries, due to their much larger population size and economic and social growth potential than developed countries, they have become more competitive “latecomer entrepreneurial countries.” In addition, remote areas face employment difficulties due to the lower level of regional economic development. Therefore, the intrinsic motivation for independent entrepreneurship is relatively strong, and the demand for entrepreneurship is relatively strong. At the same time, globalization will also bring global economic and social problems, which often need to be solved through international entrepreneurship. The effective combination of digital technology and international entrepreneurship can help entrepreneurs enhance their ability to respond to global challenges and expand the boundaries of entrepreneurial activities.

5. Suggestions and countermeasures for deepening the industry–education integration in the digital economy era

5.1 Deepen the multi-party collaborative education mechanism and give play to the collaborative role of multiple subjects

The industry–education integration is a long-term process of exchanges and cooperation among government, universities, enterprises and other stakeholders. It is necessary to establish and improve talent cultivation and management mechanisms, listen to the demands of all parties and promote long-term and efficient industry–education cooperation. Firstly, universities should give full play to their advantages in running schools, make use of high-quality educational resources, provide talent resources for enterprises and establish a diversified evaluation system.

Secondly, the government should provide guidance to establish and improve incentive, guarantee, evaluation and other related mechanisms. Local relevant departments should optimize the rules for talent evaluation, build practical training bases and ensure the smooth progress of practice. Thirdly, enterprises should provide professional technical guidance and industrial practice bases for schools, provide practical knowledge and experience for college students, provide timely feedback on market talent demand information and assist universities in developing and adjusting relevant talent training programs. Fourthly, it is necessary to establish a responsibility risk sharing mechanism to jointly bear the risks arising from the integration process, discuss solutions and plan in a timely manner.

5.2 Actively build new platforms for the industry–education integration

The construction of an industry–education integration platform aims to transform the competitive relationship between various participating entities into a mutually beneficial and win-win symbiotic relationship. Though the platform, upstream and downstream connections can be achieved, interests can be co-created and shared and resources can be optimized on a larger scale, achieving maximum benefits in higher dimensions. Both schools and enterprises can promote universities to actively connect with technological development and industrial demand, attract scientific research institutions and encourage industry enterprises to deeply participate in talent cultivation. The platform means a long-term relationship between universities and enterprises in major construction, talent cultivation, process management, responsibility sharing and achievement sharing. The new platform can promote the effective connection between the education chain and the science and technology chain, industrial chain and innovation chain.

5.3 Actively build service platforms to promote connection between supply and demand of industry–education

The Chinese government has proposed to encourage the use of information technologies such as cloud computing and big data to build market-oriented, specialized and open-sharing information service platforms for industry–education integration. In the digital era, it is imperative to build an industry–education integration platform based on information and big data technology. On the one hand, building an open and shared industry–education integration information service platform is beneficial for universities to use the data resources to depict the entire school and enterprise’s industry–education integration, achieve standardization, data analysis visualization and comprehensive effect evaluation of processes. On the other hand, the platform can gather talent supply and demand, school–enterprise cooperation, technical services, information release and related value-added services. The “industry-education integration Big Data Cloud Platform” created by Shandong Higher Education Management Science Research Association empowers the high-quality development of industry–education integration with data, providing eight service categories to society, including big data services, industry–education integration research, social demand research, expert consultation, project promotion and docking, employment and entrepreneurship guidance, achievement transformation and industry–education integration ecological construction planning. This platform effectively promotes resource co construction and sharing and powerfully supports the high-quality development of industry–education integration.

References

- Pei, C., Jiangfei, N. and Yue, L. (2018), “Political economic analysis of digital economy”, *Finance and Trade Economics*, Vol. 39 No. 09, pp. 5-22.

- Tang, W., Wen, H. and Peng, J. (2018), "The construction of collaborative education mechanism under the concept of "integration of industry and education"", *China Higher Education*, Vol. 8, pp. 14-16.
- Xiang, Y. and Chen, J. (2020), "Connection, interaction, and network effects: a study on the integration model of industry and education in the digital economy era - taking the ITPD project of Alibaba Business School as an example", *Higher Engineering Education Research*, Vol. 6, pp. 73-80.

Further reading

- Han, L. (2023), "Research on the cultivation of new retail talents by the integration of production and education under the background of digital economy", *International Journal of New Developments in Education*, Vol. 5 No. 24.
- Ju, C., Wu, Z. and Sun, F. (2021), "Research on the talents training mode of big data major under the background of integration of industry and education", *Journal of Educational Research and Policies*, Vol. 3 No. 7.
- Liu, Y. (2022), "Reconstruction of practical teaching system of accounting major based on the integration of industry, finance and tax", *Curriculum and Teaching Methodology*, Vol. 5 No. 13.
- Manaswini, M. and Borah, U. (2023), "Improvement of BIM talent training model for engineering management majors under the background of integration of industry and education", *Journal of Research in Vocational Education*, Vol. 5 No. S.
- Peng, C. (2019), "Research on the construction of the training plan of the compound navigation technical talents under the mode of the deep integration of industry and education", *Frontiers in Educational Research*, Vol. 2 No. 10.
- Shi, G. (2021), "Research on the theoretical logic and implementation strategies of the integration of production and education in applied undergraduate colleges under the new normal", *Journal of Educational Research and Policies*, Vol. 3 No. 9.
- Wang, J. (2020), "On the driving force of the integration of production and education in vocational colleges", *Journal of Educational Research and Policies*, Vol. 2 No. 7.
- Wang, Y. (2023), "Research on innovation and practice of university education management mode based on school-enterprise cooperation and integration of industry and education", *Adult and Higher Education*, Vol. 5 No. 18.
- Wu, Y., Li, F., Zhang, P. and Ma, L. (2023), "Exploration of the basic path for cultivating skilled talents through dual education and integration of industry and education", *Advances in Vocational and Technical Education*, Vol. 5 No. 9.
- Yang, L. (2021), "Research on the innovation of applied talents training mode under the background of industry education integration", *International Journal of New Developments in Education*, Vol. 3 No. 2.
- Zhao, H. and Li, S. (2024), "Study on development countermeasures of accounting major industry-education integration based new business: taking LNSF university as an example", *Journal of Higher Education Teaching*, Vol. 1 No. 1.

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