2025 Volume 3, Issue 1
Contemporary Education Frontiers
ISSN (Online): 3029-1860 ISSN(Print): 3029-1879

Research on the Collaborative Development Strategies of Artificial Intelligence Specialty and Information Technology Industry

Junjie Zhu*
Chongqing Industrial Technician College, Chongqing 402160, China

***Corresponding author:** Junjie Zhu, 158386121@qq.com

Abstract:

In today's digital wave, artificial intelligence shines like a brilliant star, illuminating the new path of technological development, while the information technology industry is the giant ship carrying it on its long voyage. As the global technological competition intensifies, the two are closely intertwined and have become the core engines driving social progress. On the one hand, artificial intelligence injects an intelligent soul into information technology and unlocks brand-new application scenarios; on the other hand, the information technology industry provides a solid foundation for artificial intelligence to land and nourishes its vigorous growth. In-depth exploration of the collaborative development path of the two is of great significance for China to seize the high ground of science and technology and drive the transformation of the industry.

Keywords:

Artificial intelligence specialty
Information technology industry
Collaborative development

Online publication: February 26, 2025

1. Introduction

In the current era, artificial intelligence, as a strategic technology leading the scientific and technological revolution and industrial transformation, is rapidly permeating various fields. The information technology industry provides a basic support for it, and the trend of their collaborative development is significant. On the one hand, artificial intelligence has higher requirements for the information technology industry; on the other hand, the information technology industry also affects the growth of the artificial intelligence specialty [1]. In-depth research on the collaborative development strategies of the two is of great significance for enhancing China's scientific and technological competitiveness and optimizing the industrial structure.

2. Current development status of artificial intelligence specialty and information technology industry

2.1. Current status of artificial intelligence specialty

2.1.1. Specialty setting and curriculum system

In recent years, many universities have responded to the needs of the times and set up artificial intelligence specialties. Their specialty settings cover multiple core directions such as machine learning, computer vision, and natural language processing. The curriculum system has been gradually improved, ranging from basic mathematics and programming courses, such as Advanced Mathematics and Data Structures, to professional core courses such as Deep Learning and Reinforcement Learning [2]. However, different universities have differences in curriculum emphasis. Some universities focus on theoretical research, and practical courses are relatively weak, and the curriculum update speed is difficult to keep up with the rapid iteration of artificial intelligence technology [3].

2.1.2. Talent cultivation scale and quality

The scale of talent cultivation continues to expand, and a large number of undergraduate, masters and even doctoral graduates enter the market every year. However, in terms of quality, due to the rapid knowledge update and strong interdisciplinary nature in the field of artificial intelligence, graduates vary in the breadth and depth of knowledge reserve and practical hands-on ability [4]. Although some students have mastered theoretical knowledge, they lack the ability to effectively solve problems when facing complex practical projects, so it is difficult for them to quickly adapt to the technical research and application needs of enterprises.

2.2. Current status of the information technology industry

2.2.1. Industrial structure and development scale

The information technology industry has formed a diversified industrial structure covering hardware manufacturing, software development, and information services. In terms of scale, the total output value of China's information technology industry has been rising year by year, and several leading enterprises with international influence, such as Huawei, Tencent, and Alibaba, have emerged, achieving remarkable achievements in fields such as 5G communication, cloud computing, and big data and becoming an important force in the global development of the information technology industry [5].

2.2.2. Technological innovation and application fields

Continuous technological innovation is the driving force for the development of the information technology industry. From breakthroughs in chip manufacturing processes to the research and development of new algorithms, from the wide application of the Internet of Things in smart homes to the exploration and practice of blockchain in the financial field, information technology is constantly expanding new application boundaries [6]. Especially under the empowerment of artificial intelligence technology, emerging business forms such as intelligent manufacturing, intelligent medical care, and intelligent transportation are booming, reshaping the traditional industrial pattern.

3. Importance and existing problems of collaborative development

3.1. Importance of collaborative development

3.1.1. Promotion of industrial innovation and upgrading

The collaboration between artificial intelligence and the information technology industry can accelerate the integration and innovation of technologies. For example, artificial intelligence algorithms can optimize software performance and improve the efficiency of hardware chip design; information technology provides massive data storage and high-speed computing resources for artificial intelligence, making artificial intelligence model training more accurate and efficient [7]. The new technologies and products generated by the integration of the two, such as intelligent robots and intelligent security systems, can encourage the information technology industry to move towards high-end intelligence, and then realize industrial innovation and upgrading.

3.1.2. Promotion of the balance between talent supply and demand

Collaborative development promotes the close alignment

of talent cultivation with the actual needs of the industry. Enterprises participate in the process of university talent cultivation, and feedback on job skill requirements, and universities optimize courses and practical teaching accordingly to cultivate professional talents that are "marketable" [8]. While filling the talent gap in the industry and alleviating the contradiction of talent supply and demand imbalance, it also ensures human and intellectual support for the sustainable development of the industry.

3.2. Existing problems

3.2.1. Disconnection between talent cultivation and industrial needs

(1) Deviation between educational concepts and social needs

Traditional educational concepts focus on the imparting of theoretical knowledge and, to some extent, neglect the cultivation of practical abilities and the actual needs of the industry. The educational systems of universities are often built around the disciplinary knowledge system to construct courses, and they do not respond promptly enough to the rapidly changing technological and market demands in the industry, resulting in a disconnection between talent cultivation and the actual needs of the industry [9].

(2) Weak connection between universities and the industry

There is a lack of in-depth and effective communication and cooperation mechanisms between universities and enterprises. Most university teachers move from school to school and lack practical work experience in enterprises, so they have a limited understanding of the cutting-edge technologies and actual work processes in the industry and find it difficult to integrate the latest industrial needs into teaching content and practical teaching links. Meanwhile, enterprises are not highly motivated to participate in university talent cultivation, and their participation methods are relatively simple, mostly staying at the superficial form of providing internship positions and failing to deeply participate in the whole process of talent cultivation, resulting in a lack of an effective bridge for the docking between university talent cultivation and industrial needs [10].

(3) Solidification of talent cultivation programs and curriculum systems

Once the talent cultivation programs and curriculum systems of universities are determined, they tend to remain relatively stable for a long time and are difficult to adjust and update quickly according to industrial development. On the one hand, the management processes such as course approval are rather complicated, involving multiple departments and links, leading to the lag in curriculum content update; on the other hand, the investment and allocation of teaching resources have a certain stability and inertia and are difficult to quickly shift to emerging industrial technology fields, thus unable to meet the new requirements of the industry for the knowledge and skill structures of talents in a timely manner [11].

(4) Insufficient practical teaching resources

Practical teaching is an important link in cultivating students' industrial practical abilities, but universities often face the problem of insufficient practical teaching resources. The facilities and equipment for on-campus practical teaching are updated slowly and can hardly keep up with the update speed of industrial technologies; the number of off-campus internship and training bases is limited, and their qualities vary [12]. Moreover, considering factors such as their own production and operation, enterprises do not provide sufficient practical projects and guidance for students, resulting in students being unable to obtain enough exercise in the real industrial environment in practical teaching.

3.2.2. Imperfect industry-university-research cooperation mechanism

(1) Differences in value orientations and goals

There are differences in value orientations and goals among universities, enterprises and

research institutions in cooperation, which is one of the fundamental reasons for the imperfect industry-university-research cooperation mechanism. The main tasks of universities are talent cultivation and academic research, and their evaluation systems focus on the quantity and quality of academic achievements, such as paper publication and the establishment of scientific research projects. Enterprises aim to pursue market benefits, maximize profits and focus on the rapid application of technologies and the market competitiveness of products. Research institutions are more inclined to explore cutting-edge technologies, conduct basic research, and pursue academic breakthroughs and innovations. These goal differences make it difficult for all parties to form a unified interest appeal and action direction in cooperation, and it is easy to have differences and contradictions in the cooperation process, affecting the in-depth development of cooperation [13].

(2) Imperfect benefit distribution and risk-sharing mechanisms

In industry-university-research cooperation, benefit distribution and risk-sharing are key issues, but the relevant mechanisms are currently not perfect. Since it is difficult to accurately quantify and evaluate the input and contribution of all parties in cooperation, the benefit distribution lacks a fair and reasonable basis, which is likely to cause dissatisfaction and disputes among the cooperating parties. Meanwhile, for potential risks such as technological risks, market risks, and intellectual property risks that may arise in the cooperation process, there is a lack of clear sharing mechanisms. All parties are worried about bearing too much risk and affecting their interests, so they hesitate in cooperate and hinder the smooth progress of cooperation projects.

(3) Imperfect communication and coordination mechanisms

Industry-university-research cooperation involves multiple subjects with different natures and the communication and coordination among all parties are rather difficult. There are differences among universities, enterprises and research institutions in organizational culture, management mode and workflow, and there is a lack of effective communication channels and coordination mechanisms, resulting in poor information transmission and low cooperation efficiency. In the implementation process of cooperation projects, the communication and coordination costs among all parties are high, and misunderstandings and conflicts are easy to occur, affecting the progress and quality of cooperation [14].

3.2.3. Unreasonable policy support and resource allocation

Policies are not precise enough to guide the collaboration between the artificial intelligence specialty and the information technology industry, and some support policies are difficult to implement. In addition, in terms of resource allocation, funds, equipment, talents and other aspects are inclined to developed regions and leading enterprises. The industrial development of small, medium and micro enterprises and underdeveloped regions faces difficulties such as a shortage of funds and a lack of talents, which all limit the comprehensiveness and balance of collaborative development.

4. Solutions

4.1. Bridging the disconnection between talent cultivation and industrial needs

The renewal of educational concepts is the key starting point. Universities should abandon the excessive tendency towards theorization and build a curriculum system driven by both theory and practice. On the one hand, every year regularly invite senior technical experts from leading enterprises in the industry to enter the school, jointly discuss the course outlines with school teachers, and update the knowledge points of courses in real-time according to the current hot applications and cutting-edge algorithms in the artificial intelligence and information technology industries, and integrate case teaching. On the other hand, it can also organize teachers to participate in practical skill training to improve their practical teaching

abilities to ensure that knowledge imparting is not disconnected from reality.

At the same time, to strengthen the connection between schools and enterprises, universities need to formulate a long-term plan for teachers to take temporary positions in enterprises. Every year, 10–15% of teachers will be selected to go deep into counterpart enterprises and participate in the research and development of actual projects to accumulate first-hand experience. Enterprises should participate in talent cultivation in an all-round way, from providing practical cases for basic courses in the freshman year to truly doing real topics for graduation designs in the junior and senior years, deeply embedding in each link and customizing courses according to the job skill model to cultivate professional talents who can quickly get started and have great potential.

In addition, in optimizing the talent cultivation process, universities also need to carry out drastic reforms. Universities can also simplify the course approval process, set up a course update group composed of the Academic Affairs Office, departmental experts, and enterprise representatives, and quickly allocate teaching resources such as teachers and laboratories every semester according to information such as industrial technology reports and industry exhibition trends, give priority to green-lighting emerging technology courses such as artificial intelligence big data analysis and intelligent chip design to ensure that courses keep pace with the times. To address the shortage of practical teaching resources, universities and enterprises can jointly build an on-campus innovation practice center. Enterprises can introduce the latest equipment through donations, low-cost leasing and other means and simulate the real industrial scene. At the same time, expand the number of off-campus internship bases, select enterprises with strong technical strength and standardized management to assign one-on-one exclusive tutors for students, design practical projects around the core businesses of enterprises, and let students grow in practice [15].

4.2. Optimizing the industry-university-research cooperation mechanism

The government should take the lead actively and jointly organize universities, enterprises and research institutions to form a strategic alliance for industry-university-research cooperation, which is the core starting point for optimizing the cooperation mechanism. All parties gather together to deeply discuss the “bottleneck” problems in the industry. Taking the research and development of self-controlled chips in artificial intelligence as an example, universities, relying on their profound academic accumulation and scientific research talents, focus on theoretical breakthroughs and provide solid theoretical support for technological breakthroughs. Enterprises, taking advantage of their natural proximity to the market, not only bring valuable application scenarios but also invest sufficient research and development funds to help scientific research achievements enter the market. Research institutions focus on long-term development, concentrate on exploring cutting-edge technologies and pursue in-depth academic innovations. In this way, through close cooperation, the three parties fully take into account the demands for academic achievements, market benefits and technological innovations, laying a solid foundation for subsequent cooperation to ensure a consistent cooperation direction.

In view of the sensitivity and criticality of benefit distribution and risk-sharing in cooperation, it is urgent to introduce professional third-party assessment institutions. These institutions accurately quantify the input and output of all parties in cooperation projects from multiple dimensions such as the flow and proportion of funds, the degree of technological contribution and the input of manpower. Based on this accurate assessment, a fair and reasonable income distribution plan that convinces all parties is formulated, and the income is divided according to a clear proportion to ensure a reasonable income for all parties. Meanwhile, before the formal start of cooperation, all parties must sign a detailed and comprehensive risk-sharing contract, clearly defining the entities responsible for bearing various potential risks such as the failure risks that may be encountered in technological research and development, the obstruction risks in market promotion and the dispute risks caused by intellectual property rights. This can jointly set up a risk compensation fund, and share the risk costs according to the proportion of capital contributions to completely dispel the concerns of all parties in the cooperation process and safeguard the smooth progress of cooperation.

To achieve seamless docking and efficient

collaboration among industry, university and research, it is also necessary to build an integrated information interaction platform, which is the key foothold for improving communication and coordination. This platform is committed to integrating the relatively closed scientific research management systems of universities, the flexible project management processes of enterprises and the open and diverse academic exchange platforms of research institutions, and realizing powerful functions such as barrier-free instant messaging, convenient collaborative document editing and real-time visualization of project progress sharing through technological integration. Based on this, regularly hold industry-university-research cooperation exchange summits every quarter to carefully set up project roadshow links to allow the wonderful display of innovative projects of all parties. It also conducts special sessions for problem diagnosis to jointly overcome thorny problems in cooperation and organizes experience-sharing activities to promote mutual learning and reference of successful experiences. Through this series of closely linked measures, comprehensively enhance the mutual understanding among all parties, timely and effectively resolve the contradictions that may arise at any time in the cooperation process, continuously improve the smoothness and effectiveness of cooperation, and promote industry-university-research cooperation to a new height.

4.3. Improving the unreasonable situation of policy support and resource allocation

To achieve precise policy support, multiple departments need to work together. The science and technology department should jointly conduct in-depth investigations with industry associations on the development pain points and needs of artificial intelligence in subdivided fields such as medical care, manufacturing and finance, as well as in different regions such as the eastern coastal areas and the central and western regions. Based on this, differentiated and targeted support policies should also be formulated. For example, special subsidies for artificial intelligence empowering the upgrading of traditional manufacturing industries should be provided. On this basis, a policy implementation tracking and feedback mechanism should be established, regularly visit the beneficiaries, and adjust and optimize promptly according to the feedback to ensure that policies are effectively implemented.

In addition, to balance resource allocation, multiple measures are needed. On the one hand, the government is required to guide and jointly organize leading enterprises to contribute funds to set up special support funds for small, medium and micro enterprises. Every year, select the funded objects according to indicators such as enterprise research and development investment and innovation achievements to help with technological upgrading. On the other hand, a talent reverse flow plan should be carried out to provide high relocation allowances and preferential treatment for children's education for talents going to underdeveloped regions; give tax reductions and subsidies for priority project establishment to enterprises that introduce talents to guide funds, equipment, talents and other resources to move towards balanced development.

5. Conclusion

The collaborative development of the artificial intelligence specialty and the information technology industry is an important task entrusted by the times and the inevitable path to realizing a powerful country in science and technology and industrial revitalization. Although there are currently many problems, with the implementation of measures such as the renewal of university educational concepts, the strengthening of school-enterprise connections, the optimization of curriculum systems, the formation of strategic alliances for industry-university-research cooperation, the improvement of benefit and risk mechanisms, the building of communication platforms, as well as the precise policy support and balanced resource allocation, the two will surely break down barriers and integrate deeply.

Disclosure statement

The author declares no conflict of interest.

References

[1] Zhou Y, Zhang X, 2023, Research and Practice on the Construction of Artificial Intelligence Specialty Group Under the Background of Information Technology Industry. Shanxi Youth, 2023(9): 97–99.

[2] Gao D, 2022, Exploration on the Construction of Information Technology Industry College in Higher Vocational Colleges From the Perspective of Industry-Education Integration. China New Telecommunications, 24(13): 164–166.

[3] Yu C, 2020, Research on the Evaluation and Influencing Factors of the Development of the New Generation of Information Technology Industry, thesis, Beijing University of Posts and Telecommunications.

[4] Zhao P, 2024, Research on the Influence of Artificial Intelligence Technology Function Characteristics on Customer Collaborative Innovation Behavior of E-Commerce Platform, thesis, Guangxi University.

[5] Zhu Y, 2023, Research and Practice of Intelligent Construction Professional Talent Training System. Chemical Industry Press, 2023: 110.

[6] He D, Jin D, Wang Y, 2023, Construction of New Artificial Intelligence Curriculum System Under the Background of New Engineering. Software Guide, 22(6): 1–6.

[7] Xu S, Guan D, Xu J, et al., 2022, Research on Training Artificial Intelligence Talents in Colleges and Universities for Industrial Needs. Software Guide, 21(7): 6–11.

[8] Han S, Chen Y, Wu P, et al., 2019, Research and Practice of Multi-Disciplinary Cross Training for Graduate Students in Artificial Intelligence. Journal of Software Guide, 20(12): 247–252.

[9] Chu H, 2017, Research Frontier Detection in the Field of Artificial Intelligence, thesis, Beijing Institute of Technology.

[10] Yu Q, 2019, Knowledge Education in the Age of Artificial Intelligence. People's Education, 2019(9): 47–53.

[11] Chen D, Liu J, Pan F, et al., 2019, Exploration and Practice of New Engineering Major Construction of Automation Driven by Artificial Intelligence. Control Engineering, 31(9): 1675–1684.

[12] Zhu Y, Li X, Zhu L, et al., 2019, Research on Teaching Reform of Artificial Intelligence Curriculum Based on OBE and Case-Driven. Journal of Software Guide, 23(11): 206–211.

[13] Ma Z, Zhai N, Wang H, et al., 2019, Exploration and Practice of the Construction of Practical Course System for Graduate Students of Artificial Intelligence Professional Degree: A Case Study of Inner Mongolia University of Technology. Journal of Software Guide, 23(8): 174–179.

[14] Zhao P, 2024, Research on the Influence of Functional Characteristics of AI Technology on Customer Collaborative Innovation Behavior on E-Commerce Platforms, thesis, Guangxi University.

[15] Liu R, 2020, The Transformation of Teacher Roles in the Age of Artificial Intelligence: Challenges and Breakthroughs: Based on Heidegger's Philosophy of Technology. Open Education Research, 2020(3): 44–50.