Original Research Article

Research on the trend and path of university talent cultivation in artificial intelligence-driven innovation consortia

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Abstract: The rapid development of artificial intelligence technology is reshaping the innovation ecology and promoting profound changes in the talent cultivation mode of colleges and universities. Through literature research, case analysis and data statistics, this paper systematically explores the new trend and implementation path of university talent cultivation in the innovation consortium driven by artificial intelligence. It is found that there are outstanding problems such as lagging curriculum system, insufficient industry-teaching synergy and single evaluation mechanism. To address these problems, it is proposed to build a closed-loop cultivation system of 'demand perception - resource reorganization - process optimization - effect tracking', emphasizing the precision, personalization and intelligence of talent cultivation through the empowerment of AI technology. The results of the study provide a theoretical basis and practical guidance for the digital transformation of higher education.

Keywords: Artificial intelligence-driven; Innovation consortium; University talent training; Trends and paths

1. Introduction

"The Outline of the National Innovation-Driven Development Strategy "clearly proposes the construction of an innovation consortium that is enterprise-driven, market-orientated and deeply integrated with industry, academia and research (State Council, 2021). As an important carrier to achieve this goal, the effectiveness of innovation consortia is highly dependent on the support of high-quality talents.

Artificial intelligence, as the core driving force of the new round of technological revolution and industrial change, is profoundly changing the global innovation pattern. According to McKinsey Global Institute's prediction, by 2030, AI technology will create $13 trillion of economic value (McKinsey, 2023). In this context, universities, as the main position of innovative talent training and the intellectual support of innovation consortia, must take the initiative to seek changes to adapt to the new requirements brought about by technological change, in order to better serve the scientific and technological breakthroughs and innovation process of innovation consortia.

This study focuses on the transformation path of university talent cultivation in the innovation consortium driven by artificial intelligence, aiming to crack the structural contradiction between the traditional education model and the demand for technological innovation, and to provide a new theoretical perspective and practical orientation for the reform of higher education.

2. Current process

2.1. International practice

Throughout the international practice, among the countries that give full play to the supportive role of colleges and universities in the innovation consortium and introduce AI into colleges and universities to better

serve the cause of training innovative talents, the United States, Germany and Japan are the various leaders, with the following specific practices:

The United States: The Massachusetts Institute of Technology (MIT) and IBM cooperated to set up the Watson AI lab, develop AI-assisted teaching design system, and train 300+ composite talents annually.

Germany: The implementation of the 'Industry 4.0 education programme', the construction of digital twin training system, to achieve the virtual and real fusion of teaching scenarios.

Japan: Implementing the 'Society 5.0 Talent Strategy', establishing the 'AI+XR' curriculum development framework, and strengthening the cultivation of interdisciplinary abilities.

2.2. Domestic exploration

Back to the domestic, because the formation and operation of the innovation consortium is still a short time, therefore, compared with foreign countries, there is a certain gap in the process of talent training and practical achievements. However, due to the increased attention of the policy in recent years and the spurt of artificial intelligence, especially the strong breakthrough of deepseek at the beginning of 2025, it has still achieved certain results.

2.2.1. Policy support

Regarding the cultivation of innovative talents driven by AI, great importance and support have been given at the national level. Among them, the Action Plan for Artificial Intelligence-Enabled Education Innovation and Development (2023-2025) issued by the Ministry of Education, which promotes the application of AI technology in the whole process of teaching, is a typical example.

2.2.2. Higher education practice

In terms of colleges and universities, in Zhejiang Province, for example, where artificial intelligence is developing at a high rate, both Zhejiang University and Shenzhen University of Technology are actively engaged in practice. Specific practices are as follows: Zhejiang University launched the 'Qizhen Innovation Laboratory', with an annual average of 37 incubated projects and a technology conversion rate of 61%; Shenzhen University of Technology and Tencent jointly established the 'Tencent Cloud Artificial Intelligence College', developing a cloud-based training resource base, with more than 500,000 visits.

2.2.3. Major developments

The progress at the university end is mainly manifested in the curriculum system, education mode and evaluation mechanism:

(1) Curriculum system: Nearly 65% of double first-class colleges and universities have opened AI-related majors or courses (Ministry of Education, 2023).

(2) Teaching mode: 43% of colleges and universities have introduced intelligent teaching systems to achieve personalized learning path recommendations (Blue Book of Education Informatization Development, 2023).

(3) Evaluation mechanism: 28% of colleges and universities have begun to explore blockchain-based credit certification system (China Society of Higher Education, 2023).

3. Existing problems

Talent development in AI-driven innovation consortia encounters problems in the following sections:

3.1. Curriculum system lags behind technology iteration

The current university curriculum system mainly has two problems: the long update cycle and the

solidification of disciplinary barriers: the long update cycle, the average update cycle of AI-related courses is 2.3 years, while the industry technology iteration cycle has been shortened to 8.2 months (IDC, 2023), there is obviously a huge time gap between the two sides; the solidification of disciplinary barriers: nearly 73% of the engineering majors are still adopting a single-discipline training programme (China Association of Higher Education, 2022), which is difficult to deal with cross-scenario problems such as smart factories. In terms of the solidification of disciplinary barriers, nearly 73% of engineering majors still adopt a single discipline training programme (China Society of Higher Education, 2022), making it difficult to cope with cross-scenario issues such as smart factories.

3.2. Ineffective mechanism of industry-academia co-operation

The mechanism of industry-education collaboration has been weakened, which is mainly reflected in the inefficiency of resource docking and the imbalance of benefit distribution: in terms of inefficiency of resource docking, only 12% of the practical projects provided by enterprises can be truly integrated into the teaching system (White Paper on Industry-University Collaboration in Educational Training, 2023). And in the part of the imbalance of benefit distribution, the disputes on intellectual property rights have led to the failure of 46% of the joint laboratories of universities and enterprises to achieve the transformation of technology (Research Data of the Ministry of Science and Technology, 2023).

3.3. Unitary evaluation mechanism

This is mainly reflected in the misalignment of competency standards and the lack of process evaluation: in terms of misalignment of competency standards, 87% of enterprises believe that there is a significant deviation between the innovation competency evaluation standards of colleges and universities and the real R&D needs (Huawei's ICT Talent Ecology Report, 2023). As for the lack of process evaluation, the existing evaluation system overly relies on final exams and lacks dynamic tracking of students' innovative and practical abilities.

3.4. Lack of composite high-quality talents

Mainly embodied in the training concept and professional setting of two parts: training concept, the rapid development of artificial intelligence gives more possibilities and development expectations of college students, but in the actual training process of colleges and universities, it is not fully integrated into the practice of the concept of complex talent training. In terms of professional setting, there are still barriers in traditional professional construction, and cooperation is limited to similar professional groups, and it is difficult to break the interface between arts and sciences.

4. Solutions

4.1. Building an AI-driven system for dynamic course generation

It is recommended to access the industrial talent demand database (e.g., LinkedIn Skill Map) and use NLP technology to extract job competency requirements in real time. At the knowledge map level, it is recommended to establish a three-level mapping model of 'technology module-competency unit-course component' to achieve automatic restructuring of course content. At the implementation case level, we can refer to the 'Smart Course Workshop' platform of Shanghai Jiao Tong University, which dynamically generates intelligent manufacturing micro-specialty course packages by analysing work orders of 2,000+ enterprises, so as to gradually shorten the

gap between the curriculum system and the technology iteration.

4.2. Creating a New Ecology of Teaching and Learning by Linking the Real and the Virtual

On the hardware level, a digital twin lab is introduced to support students' full life cycle practical training of intelligent systems with integrated physical equipment, virtual simulation and AR operator interface. On the software level, the intelligent tutor system is used to develop an AI assistant teacher with multimodal interaction capability to provide 24-hour personalized tutoring (refer to DeepMind's AlphaTutor architecture). On the typical application level, we can refer to the 'Desktop Robot Development Workshop' built by Huazhong University of Science and Technology and Loxin Technology, which adopts the innovative mode of 'theoretical lectures + practical exercises' to help trainees gain a deeper understanding of the technical characteristics and application potential of the ESP32-S3 development platform.

4.3. Innovative governance model for industry-education integration

With regard to the establishment of a mechanism of 'risk-sharing and benefit-sharing', blockchain smart contracts can be adopted to regulate the distribution of intellectual property rights (e.g., the income from the results will be automatically divided according to the degree of contribution), and encourage multi-party subjects to join in the joint cultivation of complex talents, breaking the restrictions of industries and disciplines. In addition, a university-enterprise joint innovation fund can be set up to make joint investment in forward-looking technology research and development. As for the construction of a new system of competence certification, a 'digital badge' system can be developed to transform the contribution of enterprise projects into quantifiable credits. In addition, the NVIDIA Omniverse platform can be actively introduced to carry out cross-regional collaborative R&D capability certification.

4.4. Implementation of the teacher digital competence enhancement project

In the construction of competency standards, a digital literacy framework for teachers should be actively developed, including 'AI tool application (40%), interdisciplinary curriculum design (30%), and data-driven teaching evaluation (30%)'. In terms of training mode innovation, in addition to implementing the 'academic leave' system and supporting teachers to go to head enterprises to participate in AI project research and development (e.g., Baidu's AIGC large model training), we should actively establish a digital portrait of teachers' development, and accurately push training resources (learn from IBM's Talent Development AI System).

5. Conclusion

It is an inevitable trend to promote scientific and technological innovation through innovation consortiums, break through the bottleneck of key core technologies, and realise independent control, and the role of universities as an important part of intellectual support cannot be ignored. Artificial Intelligence, gives more possibilities for discipline construction and talent training, but also brings many challenges, such as how to accurately distinguish between scientific and technological innovation outside of Artificial Intelligence, in order to make the existing professional to keep pace with the times, not to be eliminated, and to better serve the development of industry and industry. As far as the current universities are concerned, they are in the throes of the technological revolution, and only by constantly thinking of change, thinking of enterprise, and integrating into the wave of technological change with the greatest self-motivation, can they accomplish their own mission and realize the value of colleges and universities.

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