

Research on the Problems and Countermeasures of Practical Ability Training of Undergraduates Majoring in Artificial Intelligence

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ABSTRACT

To study the problem of practical ability development of current Chinese undergraduate students majoring in artificial intelligence, this paper used the literature research method to find a certain imbalance between the supply and demand of artificial intelligence professionals in China. It is mainly manifested in three aspects: insufficient supply of top talent, structural imbalance of talent supply, and weak follow-up supply of talent. Presently, the practical ability training problems of undergraduates majoring in artificial intelligence in China are as follows: teaching was separated from industrial practice, the curriculum system and teaching content were unreasonably designed, and students' practical ability was not cultivated. In view of the above problems, suggested remedial strategies are as follows, clarify the goal and orientation of professional practice ability training, innovate the practical curriculum system and build a double-position teachers team, and explore a seamless school-enterprise practice ability training model for undergraduates.

KEYWORDS

Artificial intelligence; Undergraduate training; Practical ability; Problems; Countermeasures

After years of accumulation, artificial intelligence science and technology have gradually developed from computational and perceptual intelligence to cognitive intelligence. The improvement of big data, deep learning, and computing power has helped artificial intelligence to achieve breakthroughs, and modern society has gradually transitioned from the information age to the intelligent age. The development and application of artificial intelligence technology have become a hot topic of globalization. Countries around the world have successively deployed artificial intelligence development strategies. Four key elements were indispensable in the artificial intelligence industry development. Such as scenarios, data, computing power, and talents. The talent element was the core element.

1 The Imbalance between the Supply and Demand of Artificial Intelligence Professionals in China

China's artificial intelligence industry is developing rapidly. However, the shortage of artificial

intelligence talents in China has become a bottleneck restricting the development of the artificial intelligence industry. According to a report released by the Talent Exchange Center of the Ministry of Industry and Information Technology of China, by 2025, the shortage of artificial intelligence talents in China will exceed 10 million, and the supply and demand ratio will be seriously unbalanced. It was mainly reflected in three aspects: First, the supply of top artificial intelligence talents will be insufficient, and it won't be easy to support rapid expansion. Second, there will be structural imbalances in the supply of talent at different levels, different technical directions, and different positions. Third, it will be challenging to cultivate talents, and the follow-up supply capacity will be weak, making it challenging to meet the needs of the industry^[1].

(1) Insufficient supply of top AI talents

According to the "Artificial Intelligence Development Report 2020" jointly released by the Institute of Artificial Intelligence of Tsinghua University and the Tsinghua-Chinese Academy of Engineering Knowledge Intelligence Joint Research Center, China's high-level artificial intelligence scholars are mainly distributed in the Beijing-Tianjin-Hebei, Yangtze River Delta and Pearl River Delta regions^[2]. Therefore, big cities in these regions, such as Beijing, Shanghai, Guangdong, Tianjin, etc., have become gathering places to attract artificial intelligence talents.

(2) Structural imbalance of artificial intelligence talent supply

Artificial intelligence talents were distributed in several dimensions: the primary layer, the technical layer, and the application layer, but the artificial intelligence talents at different levels were quite different. The structural imbalance of China's artificial intelligence talents was mainly manifested in: first, the imbalance of talent structure at different levels, the lack of advanced research talents and application talents at the basic level, and the weak reserve; the second was the imbalance of talent structure of different types of positions, and the supply of talents in application development positions was oversupplied and practical; the supply of talents for skilled positions was insufficient; third, the talent structure of different technical directions was unbalanced, and the technical ability required for the position did not match the actual technical level of the personnel.

(3) The follow-up supply capacity of artificial intelligence talents was weak

Practitioners in China's artificial intelligence industry were concentrated in the application layer, and high-level talents were lacking. Integrating various technologies in artificial intelligence has put forward more comprehensive requirements for practitioners' multi-disciplinary and compound professional and technical capabilities. Only by accepting comprehensive and systematic training can practitioners become high-level talents. However, the current training method was relatively simple, the training time and difficulty were relatively large, and the follow-up supply was insufficient.

2 The Cultivation of Practical Ability of Undergraduates Majoring in Artificial Intelligence in China

The primary research in artificial intelligence in China was relatively weak, the talent training system was not perfect, and teaching was separated from industrial practice. At present, the cultivation of the practical ability of students majoring in artificial intelligence in Chinese colleges and universities has not been paid enough attention to. Colleges and universities have conducted

various explorations to strengthen school-enterprise cooperation and cultivate students' innovation and practical ability. For example, they established practice bases, hired corporate mentors, developed vocational and academic integrated courses, and held various competitions. However, these reforms' effect was insignificant, and the problem of insufficient professional practical experience of undergraduates majoring in artificial intelligence was still prominent. The questionnaire survey shows that the most dissatisfied enterprise was the practical ability of the graduates^[3]. The embarrassing situation of the shortage and oversupply of China's artificial intelligence undergraduate graduates coexisted.

(1) The separation of teaching and industrial practice

It wasn't easy to cultivate artificial intelligence compound talents in China. The current artificial intelligence undergraduate graduates trained by colleges and universities were challenged to meet the actual needs of the artificial intelligence industry. First, the teachers and courses related to artificial intelligence majors in most universities in China are still not perfect, and it was difficult for the undergraduate graduates to quickly adapt to and match the pace of industrial development and enterprise needs; secondly, enterprises had higher access requirements for graduates, and People working in artificial intelligence has the professionalism characteristics of multi-disciplinary intersection such as compound type and knowledge-intensive. In contrast, fresh undergraduate graduates had high access requirements. There was often a lack of artificial intelligence knowledge reserves and practical experience, and the disconnection between teaching and industrial applications led to the inability of trained talents to meet the employment needs of enterprises.

(2) The design of the curriculum system and teaching content is unreasonable

Artificial intelligence technology had the characteristics of real-time and transient, and the technology iteration was very fast. The knowledge system of artificial intelligence courses was imperfect, and the teaching content was not updated promptly. Some of the current teaching contents of artificial intelligence majors cannot keep up with the rapid pace of knowledge updates in this field.

(3) Inadequate training of students' practical operation ability

Currently, teachers of artificial intelligence majors in Chinese colleges and universities focus on theory rather than practice. Teaching focuses on professional knowledge imparting rather than comprehensive quality and practical ability training. Most teachers cannot keep abreast of the employment needs of local governments, enterprises, and institutions. In terms of students' practical ability, although some students have basic theoretical knowledge, their practical ability was not satisfactory.

3 Based on the OBE Concept, Formulate a Practical Ability Training Strategy for Chinese Artificial Intelligence Undergraduates

The concept of outcome-based education (hereinafter referred to as the OBE concept) was first proposed by American scholars Sapdy and others in 1981^[4]. The OBE concept emphasizes results-oriented teaching design, teaching implementation, and other links according to the expected learning outcomes that students want to achieve. When AI major teachers carry out teaching design, priority should be given to the requirements of employers for the professional skills of

undergraduate graduates, adhere to the student-centered concept, focus on practical teaching, improve students' practical ability, and cultivate students' autonomous learning ability and empower students' practical ability to help students obtain learning outcomes, and meet the needs of employers.

(1) Clarify the target positioning of professional practice ability training

Combined with the practical ability needs of graduates majoring in artificial intelligence for local economic development, find the positioning of artificial intelligence suitable for the university itself. Colleges and universities should analyze the development status and development trend of the local economy, combine the local industrial structure, find out the social requirements for the practical ability required by graduates majoring in artificial intelligence, and determine the professional knowledge and practical capabilities required by AI practitioners and determine the learning outcomes required for graduates.

(2) Innovate the practical curriculum system and set up a double-qualified teacher team

The curriculum system of artificial intelligence in colleges and universities should focus on results-oriented. In-depth research on enterprises in the artificial intelligence industry, aiming at the employment needs, job responsibilities, and professional ability requirements of various enterprises and institutions, design the artificial intelligence professional practice curriculum system in a targeted manner and cultivate students' practical ability. Colleges and universities should increase internship training courses, encourage students to participate more in practical innovation activities, organize students to visit, train, and practice in corresponding enterprises and institutions, guide students to participate in various competitions, guide students to declare and participate in scientific research projects, and combine real practice projects, from easy to difficult, enable students to master the practical skills of artificial intelligence graduates required by employers. The cultivation of the practical ability of undergraduates requires the full cooperation of colleges and universities, all professional teachers, students, and employers. Colleges and universities should introduce external enterprise teachers with rich practical experience, and external teachers should conduct practical courses according to the practical skills requirements of artificial intelligence undergraduate employers.

(3) Explore the school-enterprise seamless connection mode of undergraduate graduates' practical ability training mode

Self-learning ability and the creative ability to transform work experience into new knowledge are the practical abilities most valued by enterprises. This is precisely what colleges and universities lack in welcoming graduates. In-depth promotion of school-enterprise cooperation is expected further to break the boundaries between campus and enterprise learning. Some colleges and universities have begun to explore the quality standards and evaluation and certification methods of workplace learning outcomes to connect with the school's evaluation system and incorporate the practical corporate experience into the university education system. These reform attempts mainly included: first, establishing a flexible academic system; second, improving students' innovative performance in the workplace, invention patents, tangible results, etc., for quality assessment and credit certification; third, establishing a student practice credit bank or portfolio system, when the credits converted from work experience accumulates to a certain level and meets the standards for degree application, students can apply for the corresponding degree. The above measures enabled

work experience and achievements to obtain academic certification, solving the structural contradiction that the practical ability of undergraduate graduates majoring in artificial intelligence did not match the job requirements. The introduction of practical corporate experience is also conducive to students returning to campus from companies to drive and guide students to deeply understand artificial intelligence majors and the needs of enterprises for undergraduate graduates, act as opinion leaders, and reverse the team that promotes the practical ability of artificial intelligence graduates promote.

4 Conclusion

Due to some deficiencies in the practical ability training of undergraduates majoring in artificial intelligence in China, it is the only way to make specific strategies to improve them. The training strategy based on the result-oriented concept is helpful for the following strategies: clarifying the target positioning of professional practice ability training, innovating the practical curriculum system, setting up a double-qualified teacher team, and exploring the seamless connection mode between campus and enterprise to train the practical ability of the college graduates.

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