Research on the Construction of a Talent Training Mode for Artificial Intelligence Specialty in Local Colleges and Universities

Yi Qian*

Department of Information Science and Technology, Taishan University, Taian 271000, Shandong Province, China

*Corresponding author: Yi Qian, bjkdqy@126.com

Abstract: In order to serve the local economic development, this study investigates the demand for local talents and analyzes the characteristics of the talent training in artificial intelligence in local colleges and universities. Subsequently, the talent training objectives of artificial intelligence specialty have been formulated, and a curriculum system that integrates the industry and education has been constructed in hope to continuously provide high-quality talents in artificial intelligence for the society.

Keywords: Artificial intelligence; Professional direction; Curriculum construction; Personnel training

1. Introduction

Artificial intelligence is not only an impetus for economic development, but also the driving force of the fourth industrial revolution. The state attaches great importance to the development of a new generation of artificial intelligence technology [1,2]. Artificial intelligence specialty has become a new higher vocational specialty within the field of education in 2019.

Local colleges and universities are the sanctuary for the training of artificial intelligence professionals in China. They have important responsibilities for scientific and technological innovation and services [3-5]. The training of artificial intelligence professionals should be continuously strengthened. In moving toward an innovative development of the society and the improvement of productivity, talents are required to support high-quality students.

According to the work arrangement of colleges in formulating talent training plans, this study investigates the talent market demand and employment requirements, in order to understand the corresponding professional talent training requirements of the artificial intelligence specialty [6,7]. Then, the specifications of artificial intelligence professional training in local colleges and universities are studied, analyzed, and formulated, and the curriculum system of professional talent training is constructed.

2. Talent demand analysis and students' current situation

Through the investigation of local and regional talent demand, it has been found that the employment prospects of artificial intelligence specialty are broad but there is a short supply of talents. The industry the specialty faces is the software and information technology service industry. It engages in computer software

engineering technology and information system analysis engineering technology. The main candidates are big data analyst, artificial intelligence operation and maintenance engineer, machine learning engineer, and natural language processing application engineer.

With the continuous expansion of the scale of higher education, the number of students continues to increase, and the enrollment performance of students has decreased compared with the past. Some students have weak foundation, and their learning skills need to be improved. Most students have no career development plans or clear understanding about the career they would engage in. In schools, many students lack the enthusiasm for autonomous learning, resulting in passive learning. As for the source of geographical distribution, there are students in the province and outside the province. Students from different geographical regions and family backgrounds have vast differences in values, intellectual qualities, and personalities.

3. Construction of a talent training mode for artificial intelligence specialty

3.1. Establishing talent training objectives

Based on the concept of OBE (outcome-based education), artificial intelligence courses in local colleges and universities should face technical services in a specific direction. Therefore, education institutions should focus on the teaching of technology application. Local colleges and universities should take achievement as the goal, popularize the knowledge of technology application to students, and make full use of the functions provided by the basic core layer. The talent training of artificial intelligence specialty should be based on the needs of high-tech industries in the region, integrating artificial intelligence technology, constantly innovating artificial intelligence technology, and finally promoting regional economic development. The training goal of artificial intelligence professionals in local colleges and universities should be comprehensive. Students should have good morality, high intelligence, good physique, aesthetics, and labor, as well as strong innovation ability. While promoting employment, it can also realize the sustainable development of students.

It is feasible to focus on two to three specific directions in the teaching of artificial intelligence specialty in local colleges and universities. According to the results in this study, artificial intelligence specialty can be divided into three directions, and each direction involves many specific technical levels. The education of students majoring in artificial intelligence in local colleges and universities must be committed to the basic theories and skills of artificial intelligence. It can provide systematic practical training activities for students, enable students to develop and test intelligent applications in relevant industries, maintain the normal operation of the artificial intelligence system, and manage the sales, consultation, and after-sales activities of artificial intelligence products.

3.2. Establishing an integrated industry-education talent training mode

The use of artificial intelligence applications is closely related to typical application scenarios. In practical work, a high degree of integration of programs and application scenarios must be realized. Local colleges and universities lack the environment, data, and computing capacity required for industrial applications as well as the hypothetical scenarios for implementing projects. If colleges and universities are unable to cooperate closely with enterprises, the training effect of students would not be ideal. The knowledge and skills acquired by students are likely to be far from or lagging behind the actual situation of the industry and enterprise.

Local colleges and universities should recruit outstanding enterprise workers and deepen the cooperation in the field of productivity. The cooperation between educators and enterprise workers can improve the talent training mechanism in the field of artificial intelligence. Local colleges and universities

should establish an education platform guided by practical projects. Through the cooperation between education and enterprises, it would be possible to cultivate talents in artificial intelligence and promote industries as well as enterprises to deliver high-quality resources to local colleges and universities. In this way, the latest industry and enterprise employment standards as well as applied technology experience would be introduced into local colleges and universities.

Local colleges and universities introduce cooperative enterprises and put them in a real business environment through project cooperation with local enterprises. It does not only cultivate students' skills in using technology and solving problems independently, but also improve their social competitiveness and acceptance of corporate culture.

Therefore, the design idea of the talent training mode for this major in local colleges and universities is to establish a training mode integrating production and education.

(1) Arrange personnel to conduct talent demand research in local areas; determine the objectives as well as specifications of professional talent training according to the professional employment standards.

(2) Build a curriculum system with professional talent training and set the teaching content of the curriculum according to the employment requirements of the professional group corresponding to the specialty, with reference to the professional qualification standard of artificial intelligence technology and the teaching standard of artificial intelligence technology service specialty.

(3) Select representative enterprises, and jointly build a number of open training bases for teaching, training, and scientific research.

(4) Strengthen the construction of teaching staff and build a group of "double qualified" teachers with noble ethics, strong professional skills, strong innovation awareness, and other excellent comprehensive quality and ability.

(5) Implement the follow-up survey of graduates; revise as well as improve the talent training plan.

(6) Track the employment situation of graduates, collect information, and revise the talent training plan in time.

3.3. Constructing a talent training curriculum system

When constructing a curriculum system, it is necessary to consider the characteristics of students in local colleges and universities as well as carry out the integration of industry and education. Focus on professional posts, such as big data analyst, artificial intelligence operation and maintenance engineer, machine learning engineer, and natural language processing engineer. Closely combine the development of artificial intelligence technology with teaching, as well as the teaching process with the talent needs of front-line enterprises. A curriculum system should be built based on the job process; projects should be assumed as the carriers while tasks as the drivers in carrying out teaching. The training goal for students majoring in artificial intelligence is to design a curriculum system based on the knowledge and quality required to develop professional skills and aiming at application.

3.3.1. Ideas for developing the curriculum system

First, sign teacher training agreements with enterprises. Continuously send young teachers to enterprises for learning and to understand the principle of artificial intelligence. These teachers should then teach their students based on the knowledge learned.

Secondly, contact local enterprises, and analyze the needs of local enterprises. Artificial intelligence is introduced into the actual scene, from focusing on theoretical teaching to paying equal attention to practice

and theory. Achieve the combination of point and area, as well as focus on the systematic and practicability of the theory, so as to effectively make up for the deficiency of basic knowledge among students.

Finally, strengthen the practical curriculum and effectively cultivate students' skills in applying professional skills. Solving the issue of students' learning formalization is an effective means to improve their technology application skills according to the employment needs. Teachers can choose specific enterprise projects and set up practical teaching contents based on the development of professional skills and practical technology.

3.3.2. Construction of the curriculum system

Artificial intelligence is interdisciplinary in nature. The construction of the curriculum system enables students not only to learn the theory of artificial intelligence in class, but also to integrate the learned knowledge into solutions. Students apply them to the actual production process of local enterprises to lay a certain foundation for innovation and entrepreneurship projects. Cultivate the skills of talents majoring in artificial intelligence in an all-rounded way. Students can build knowledge systems in a wider range of fields, such as information technology, software technology, and digital electronic technology.

The course structure of artificial intelligence can be divided into general education course, professional course, and elective course. Professional courses include professional basic courses and professional core courses; professional basic courses include basic knowledge and theory, while professional core courses allow the mastering of artificial intelligence application technology in some directions. Professional elective courses provide further guidance for students' artificial intelligence learning activities. Students can choose a specific learning direction according to their interests in order to highlight the advantages of personalized talent training.

The specific courses are as follows:

(1) general education courses include the introduction to the new era thought and the theoretical system of socialism with Chinese characteristics, ideological and moral cultivation and legal basis, public English, sports and health, military education and training, situation and policy, college Chinese, fundamentals of computer application, mental health education for college students innovation and entrepreneurship education, career planning and employment guidance for college students, safety education, learning methods, innovative thinking, management communication, entrance education, graduation education, advanced mathematics, linear algebra, as well as other courses, with a total of 888 class hours and 47 credits;

(2) professional basic courses consist of 8 courses, including C language programming, computer network technology, computer assembly and maintenance, data structure and algorithm, database principle and application, data annotation engineering, introduction to big data, as well as Linux operating system, with a total of 544 class hours and 30 credits;

(3) professional core courses consist of 8 courses, including Python program design, introduction to artificial intelligence, data cleaning, basics and advanced application of TensorFlow, OpenCV, machine learning, deep learning, and post practice, with a total of 1032 class hours and 52 credits;

(4) professional elective courses consist of five courses, including cloud computing technology, data mining, data visualization, natural language processing, computer vision, and Java programming, with a total of 522 class hours and 29 credits.

4. Scientific evaluation of the talent training system

In evaluating the talent training system, it is necessary to focus on two aspects:

(1) whether the determination of the teaching philosophy and teaching objectives are reasonable;

(2) the students' problems, learning skills, and imbalanced mastery of basic knowledge; the results of teaching activities vary from person to person.

In the era of artificial intelligence, there is no clear understanding of students' development. The difficulty of teaching is to balance employment and the cultivation of a lifelong learning concept among students.

The vocational training level of local colleges and universities determines the employment prospects of graduates to a large extent. In the vocational training of artificial intelligence, the development level of each educational institution is different. Some institutions have changed from theoretical education to practical education, while others are focusing on the transition from an integrated low-skill development model to a high-skill development model.

In order to ensure the quality of talent training, the talent training system needs to be evaluated. The evaluation can be divided into two stages.

(1) Evaluate the rationality of the training objectives. Assess the extent to which the development goals have been achieved and to which the talent training system has met the needs of social progress in developing countries.

(2) The evaluation of students includes four levels: performance evaluation, analysis, improvement of talent training system, and continuous improvement of training quality. Assessment is a continuous and periodic work to ensure that graduates meet all sorts of requirements. The assessment of students includes classroom performance, examination results, humanistic quality, and technical application skills.

5. Conclusion

In conclusion, new progress has been made to industrial reform with the support of artificial intelligence. In order to cultivate a sufficient number of highly-skilled talents in artificial intelligence, local colleges and universities need to establish a wide-ranged training and development program for skilled talents, pay attention to the transition and adjustment of talent training program for artificial intelligence vocational training, establish a new education system, improve the technical application skills of artificial intelligence professionals, as well as truly realize the innovative development of higher education to ensure its contribution to the industry.

Disclosure statement

The authors declare that there is no conflict of interest.

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