

# Research on Talent Training of Artificial Intelligence Specialty in Higher Vocational Colleges Based on Post Data Analysis of New Engineering

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## ABSTRACT

This paper analyzes the relevant systems in the new engineering field proposed by the Ministry of education, and makes statistics on the current enterprise demand data for talents in artificial intelligence related posts. Through the analysis and comparison of data, this paper integrates the industry standards and professional curriculum system, and establishes a talent training model for artificial intelligence technology application Majors Based on post data analysis. Integrate the occupational requirements of artificial intelligence majors in higher vocational colleges with the goals of talent training, improve students' post competitiveness and talent training quality, and realize the accurate training of talents under big data analysis. So that the talents trained by artificial intelligence specialty in higher vocational colleges can better deal with the pressure brought by scientific and Technological Development and alleviate the contradiction between supply and demand of enterprise post talents.

**Keywords:** *New engineering, Job data analysis, artificial intelligence, Talent training model.*

## 1. INTRODUCTION

With the continuous progress and development of science and technology, emerging industries characterized by high and new technologies such as cloud computing and big data are developing rapidly. Traditional engineering majors are facing transformation and upgrading, which puts forward higher requirements for the training of current engineering talents. Artificial intelligence New engineering majors such as technology application have also emerged as the times require. This research analyzes the job data related to artificial intelligence in the enterprise, combines the needs of the enterprise with the artificial intelligence professional talent training plan, establishes a talent training model, and explores a new model of targeted talent training by optimizing the curriculum design and restructuring the curriculum system. , to achieve a seamless connection with the market industry demand, and provide a reference case for the training of artificial intelligence professionals in higher vocational colleges.

## 2. NEW ENGINEERING BACKGROUND

In 2017, the Ministry of Education held a seminar on the development strategy of Higher Engineering Education in Fudan University, in which it was proposed that colleges and universities should accelerate the development and construction of new engineering majors. In order to actively respond to a new round of industrial reform and scientific and technological revolution in the present era in the future, relying on the traditional engineering majors, they should actively layout the key areas of scientific and Technological Development in the future, Focus on accelerating the training of scientific and technological talents in emerging fields, and explore new models, new standards, new concepts, new models, new methods and new culture of professional construction in the field of "new engineering" at this stage[1]. In 2019, the Ministry of education proposed to further promote the construction of "new engineering", aiming to carry out the research and practice of new engineering and promote the deepening of the field of new engineering.

At present, with the continuous deepening of projects in Guangdong, Hong Kong and Macao Dawan district

and the continuous improvement and development of artificial intelligence industry chain, there is an increasing demand for artificial intelligence talents. Due to the diversity of enrollment sources in Higher Vocational Colleges and the great differences in the quality of individual students, when setting up artificial intelligence technology application specialty, its specialty involves many fields, so it is impossible to form targeted teaching for differentiated students, The teaching objectives of the major are not clear, which leads to the lack of combination of talent training with the needs of enterprises, and the talent training scheme can not meet the current situation of students in higher vocational colleges. As the development direction of educational reform and innovation in higher vocational colleges, artificial intelligence technology application specialty needs to combine theory with practice, continuously improve the training objectives, curriculum system and training scheme of innovative talents, and cultivate talents suitable for the development of social industries.

### 3. JOB DEMAND DATA ANALYSIS

In recent years, the field of artificial intelligence has received great attention and attention. The state has successively issued documents, including the notice of the State Council on printing and distributing the development plan of the new generation of artificial intelligence, the three-year action plan for promoting the development of the new generation of artificial intelligence industry (2018-2020), the development plan of the new generation of artificial intelligence in Guangdong Province, and actively promoted the development of the field of artificial intelligence, The State Council also put forward the three-step strategic goal in the development plan for a new generation of artificial intelligence issued in 2017. By 2030, the relevant theories, technologies and applications of artificial intelligence will generally reach the world leading level and become the world's main artificial intelligence innovation center. Recently, according to the data collected from Zhilian recruitment, 51job and other websites, there is a huge demand for talents in the field of artificial intelligence application, with more than 30000 relevant posts. According to professional ability and recruitment heat, four main posts are mined and integrated: artificial intelligence R & D Engineer, artificial intelligence technical support, artificial intelligence trainer and artificial intelligence test engineer [2], The proportion analysis of post big data is shown in Figure 1.

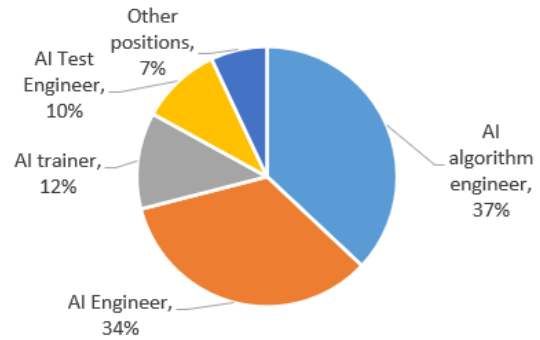


Figure 1 data analysis chart

#### 3.1. AI algorithm engineer

Mainly responsible for the demand analysis, product design, algorithm model research and development of artificial intelligence products. Job requirements mainly include: Mastering python, Java and other programming languages, having a good foundation for data structure, algorithm analysis and design, being familiar with the basic theories and methods in the field of natural language processing or graphics and image processing, mastering one or more deep learning framework technologies such as Caffe and python, and being familiar with Hadoop, spark Storm and other common big data platforms or core functional components have good learning ability, data logic thinking ability and team cooperation ability.

#### 3.2. Artificial Intelligence Engineer

Mainly responsible for data cleaning and screening, data labeling, data collection and data storage, research, design and development of deep learning algorithm, grid optimization, model improvement and adjustment, pre-sales and after-sales technical support of artificial intelligence projects, etc. Job requirements mainly include: being familiar with the theoretical basis and practical experience in artificial intelligence, machine learning, neural network, decision tree, etc., being familiar with the use of common web service frameworks such as node and python, being familiar with the deep learning framework, being able to independently complete the integrated development of deep learning algorithms, being familiar with the Linux operating system, and being able to complete project development under the Linux system environment, Strong sense of responsibility, initiative and teamwork spirit.

#### 3.3. AI trainer

It is mainly responsible for data labeling, labeling and classifying graphics, images, audio-visual and other data, analyzing and modeling data according to business scenarios, statistics of relevant data reports, timely maintenance and data model, and completing the tracking and maintenance of core indicators of products. At the

same time, cooperate with technology, product, operation and other teams to jointly optimize the intelligent experience of AI related products and improve customer satisfaction. Job requirements: be familiar with relevant products and business service modes of artificial intelligence, have good data analysis ability, master the basic processes and methods of data labeling, and have the data processing ability of image, video, voice and other data. Strong communication skills, practical and responsible, and the ability to independently analyze and realize product requirements.

### ***3.4. AI Test Engineer***

It is mainly responsible for software testing, product performance testing and reliability testing of intelligent software products developed by the enterprise, formulating test plans according to customer needs, being able to complete relevant test projects and submit test reports, tracking and solving software vulnerabilities, timely reporting work progress according to test reports, and improving relevant test guidelines, test specifications and other technical documents. Job requirements mainly include: strong learning ability, understanding the technical architecture of artificial intelligence, mastering key technologies such as machine learning, in-depth learning and computer vision, being able to build an automated test platform, complete automated testing, being familiar with automated testing, functional testing, interface testing, etc., and having good documentation and written expression skills, Can independently complete the formulation or preparation of technical schemes, have good interpersonal and communication skills, and have strong ability of task management and coordination.

## **4. VOCATIONAL ABILITY TRAINING SYSTEM**

### ***4.1 Orientation of vocational ability training***

At present, with the continuous development of relevant technologies in new engineering fields such as big data, cloud computing and artificial intelligence and the continuous emergence of new architectures, artificial intelligence technology is gradually integrated into life, and the society has more and more requirements for the cultivation of artificial intelligence professionals. How to realize the development of artificial intelligence technology and improve the quality of talent training, and improve the employment competitiveness and social adaptability of students majoring in artificial intelligence is a problem that higher vocational colleges should consider at present. The talent training plan of artificial intelligence specialty formulated by higher vocational colleges should clarify the talent development orientation according to the current social development and the actual needs of enterprises. Only by closely relying on the

needs of enterprises can we accurately locate the training path of artificial intelligence talents and ensure the reliability and timeliness of the training scheme. According to the demand data of the enterprise, the talents needed by the enterprise are mainly concentrated in the posts of Artificial Intelligence Engineer, algorithm engineer and test engineer. Combined with the actual situation of students in higher vocational colleges, the training goal should be positioned in the management and maintenance posts of artificial intelligence test engineer and intelligent trainer, and should cultivate good professional ethics, and professional quality, Be familiar with computer network knowledge, skillfully apply data product tools, artificial intelligence products, system testing tools, system maintenance and other technologies to solve practical problems, mainly engaged in intelligent product maintenance, intelligent system testing, artificial intelligence pre-sales and after-sales work, and be able to adapt to artificial intelligence related production, management High quality technical and skilled talents required by the front line of maintenance and service..

### ***4.2 Vocational ability training objectives***

The talent training of artificial intelligence specialty has high requirements for practical ability. It pays attention to multi-dimensional and three-dimensional training of students' knowledge breadth, learning depth and innovative learning ability. To cultivate compound artificial intelligence talents, we need to constantly reform the training mode of innovative talents and formulate the training objectives of talents' professional ability in combination with the development of technology and the talent post needs of enterprises, Achieve a high degree of consistency between enterprise needs and talent training objectives, encourage students to learn enterprise project cases, learn the knowledge required by project cases and carry out project related activities during school, so as to achieve the purpose of cultivating students' post knowledge ability, post practice ability and post innovation quality, and realize the effective connection between talent training and enterprise post needs. The main learning objectives are as follows:

**Table 1.** Short cut keys for the template

ability training	Training requirements
Knowledge ability	Master basic computer knowledge and common instrumental knowledge, python, Java and other programming languages, in-depth learning framework technology, product design, data modeling and algorithm model development, node, Python and other common web service framework technology, database, data analysis, web crawler technology, basic knowledge of data cleaning and data standards, product testing Knowledge of safety test and reliability test.
practical ability	Have the ability to label, model and classify graphic images, audio-visual and other data, the data processing ability of graphic images and other data, the application ability of big data platform or new components, the ability to independently analyze and realize product requirements, the ability to complete the tracking and maintenance of product core indicators, and the data processing ability of graphic images and other data, The ability to complete the integrated development of deep learning algorithms and optimize the intelligent experience of AI related products.
Innovative quality	Have good learning and data logic thinking ability, independent analysis and Realization of product requirements, good interpersonal and team cooperation ability, good documentation and written expression ability, strong communication and communication ability, strong operation ability and innovation ability.

### 4.3 Vocational ability training model

Under the background of new engineering, the goal of teaching reform and practice of artificial intelligence specialty in higher vocational colleges is to cultivate high-quality technical, skilled and innovative talents. The professional talent training system is required to be oriented by the needs of enterprises, cross integrate computer science and technology, intelligent science and other related majors, highlight the "ability output" as the guidance, and optimize and reform the talent knowledge system [3]. In January 2019, the State Council issued the implementation plan of national vocational education reform (hereinafter referred to as Article 20 of Vocational Education), in which "1" and "X" refer to academic certificates and several skill level certificates respectively, and students are encouraged to actively obtain various vocational skill level certificates during school. Huawei Technology Co., Ltd. has a certain influence in the industry. The professional skill level standard of intelligent computing platform application development is a 1 + X certificate standard jointly developed by Huawei based on many years of industry experience and enterprise needs and organized industry experts. It mainly trains artificial intelligence talents engaged in intelligent computing platform construction, platform management, IDE integrated development environment deployment and system commissioning, data management and analysis processing, basic function application development and artificial intelligence application product development and testing [4]. Huawei 1 + X certificate system, curriculum system and other methods are introduced into the talent training scheme to gradually improve and enhance the training ability of artificial intelligence innovative talents. By taking advantage of Huawei's ICT competition for Chinese college students and Huawei's double selection committee, student competition and internship employment are included in the professional talent training plan, and a reasonable and complete curriculum system is set up through such links as setting courses by post, promoting learning by competition and determining standards by certificate, so as to establish a perfect implementation mechanism of the curriculum system, Create a "post course competition certificate" integrated "professional talent training mode based on Huawei 1 + X certificate, combine Huawei's leading advantages in technology and services with the job requirements of artificial intelligence talent training, and cultivate new engineering talents based on the job requirements of enterprises.

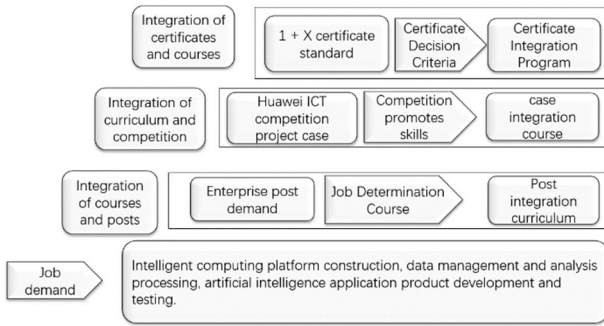


Figure 2 Ability training model

5. SKILL ASSESSMENT

Artificial intelligence technology is systematic and practical, and has been widely used in many fields of national economy and people's livelihood, such as smart city, smart security, smart medical care and so on. Therefore, the course assessment of artificial intelligence should focus on cultivating students' ability to systematically solve practical problems by using artificial intelligence related technologies [5]. The implementation of "1 + X" certificate is a change in the course assessment mode and talent training mode of artificial intelligence technology application specialty. The teaching link adopts the teaching mode driven by case and guiding task. The course assessment mode should not be the traditional single assessment mode. The course assessment is combined with vocational certificates. Based on the job requirements of enterprises, schools and enterprises jointly train students. The certificate system developed by Huawei's intelligent computing platform application is relatively mature. In the process of course assessment and evaluation, the combination of certificate related learning results is realized to realize credit replacement. If students pass the examination of vocational skill level certificate, they can apply for exemption from the final examination of corresponding courses and use the examination result instead of the final examination result. It is not only the recognition way for students to master vocational skills through learning, but also can increase students' understanding of the industry, turn the existing talent training mode from school to society, and turn the closed education mode to the open education mode, which is not only the educational trend of current social development, but also the need for the personalized development of students' ability.

Table 2. Exam replacement table

1+X Certificate	Exam results	Replace course	Exemption part
primary	qualified	Data annotation technology, python web crawler technology	Final examination
intermediate	qualified	Python data analysis, data cleaning technology	Final examination
Innovative quality	qualified	Deep learning technology, machine learning technology	Final examination

6. CONCLUSION

The artificial intelligence technology under the background of new engineering construction has broad application prospects. At the same time, it also puts forward higher requirements for the post knowledge ability, practical ability and innovation literacy of artificial intelligence talents. Based on the data analysis of the demand for relevant professional posts in artificial intelligence professional enterprises, this paper explores the talent training system guided by industry certificates, with competition promoting learning, competition positive integration and course certificate integration. It strengthens the formative cultivation of students' knowledge, ability and comprehensive quality, and provides new ideas for cultivating talents in the direction of artificial intelligence under the background of new engineering.

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