

# The Innovation of Teaching Mode of Computer Public Courses in Higher Vocational Colleges under the Background of Artificial Intelligence

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**Abstract:** In the information age represented by artificial intelligence technology, new requirements of the times are put forward for the construction of higher vocational talents' knowledge level, skill structure and comprehensive quality. The construction of public computer courses in higher vocational colleges requires continuous reform and innovation of teaching model, reorientation and adjustment of teaching objectives, reform and innovation of teaching model, emphasis on improving the breadth, creativity and complexity of students' knowledge and skills, and training a group of outstanding vocational and technical personnel with strong independent learning ability, innovation and entrepreneurship ability and exquisite practical skills to meet the needs of industrial structure transformation and upgrading. Under the background of artificial intelligence, the reform measures of public computer courses in higher vocational colleges include: reconstructing the content of public computer courses by integrating the knowledge of artificial intelligence, constructing modular courses that adapt to multi-specialty and diversity, upgrading the original training platform of computer courses, and constructing training platforms and teaching resources that match the new curriculum system.

**Keywords:** artificial intelligence; basic computer education; ability training

## 1. Introduction

At present, artificial intelligence, as the focus of international competition, has been greatly accelerated by many developed countries to enhance the core competitiveness of national science and technology and economy. In the *Development Plan of New Generation Artificial Intelligence (Guo Fa [2017] No.35)*, it is clearly stipulated that people should actively carry out artificial intelligence education and encourage scientific and technological talents to actively participate in the popularization of artificial intelligence, all of which indicate that the intelligent era has quietly begun. Higher vocational colleges should keep up with the trend of science and technology, carry out the teaching reform of

computer public courses, popularize the knowledge of artificial intelligence, promote students of various majors to actively study and research artificial intelligence technology, cultivate innovative thinking and imagination, and promote the development and application of artificial intelligence in various industries, so as to contribute to China's science and technology strategy.

## 2. Reform for Computer Public Courses in Higher Vocational Colleges

Artificial intelligence, as the core driving force in the new era of science and technology, has promoted a new round of industrial transformation and upgrading. For higher vocational education, which has the closest and most direct connection with the development of the industry, it is necessary to pay attention to the new requirements of science and technology and industrial revolution on the knowledge level, skill structure and comprehensive quality of talents, and to adjust and reform the training objectives and teaching mode of talents in order to cultivate compound talents meeting the needs of the new era. Li Guangping and other scholars have proposed that updating the concept of talent cultivation, improving the relevant literacy of teaching subjects in artificial intelligence, optimizing the allocation of resources and strengthening inter-school coordination are the reform paths of talent cultivation in the era of artificial intelligence<sup>[1]</sup>.

The rapid development of information technology has greatly promoted the importance of computer public education in universities, and prompted many university experts and scholars to explore and study the reform direction of computer public education. At present, the computer public courses for non-computer students offered by higher vocational colleges are mostly evaluated as negative, while students regard this course as boring and not directly related to their majors. When it comes to artificial intelligence technology, students generally think that it is esoteric and only for computer majors. Besides, there is basically no knowledge of artificial intelligence in the textbooks of computer public courses used in higher vocational colleges. Under the background of technological and industrial changes, the

serious lack of computer knowledge of non-computer majors is not conducive to the transformation from single skill training to compound talents training, and is not conducive to the all-round development of artificial intelligence technology in all sectors of society, which does not meet the needs of today's national strategic development. Therefore, it is urgent to reform and innovate the public computer courses in higher vocational colleges by developing the contents of the public computer courses which are aimed at all students, integrating artificial intelligence knowledge and rich in content, and cooperating with the training platform of artificial intelligence with strong universality, to cultivate the computer thinking ability and practical ability of students of all majors.

### 3. Ability Training of Higher Vocational Students under the Background of Artificial Intelligence

In the era of information technology represented by high and new technologies such as artificial intelligence and big data, a large number of new industries, new engineering technologies and new production equipment will emerge, which will bring great opportunities and new challenges to higher vocational colleges in China. Higher vocational education should focus on the long-term future, attach importance to cultivating the breadth and comprehensiveness of students' basic knowledge and skills, and cultivate professional talents with independent learning ability, innovation and entrepreneurship ability and exquisite skills.

#### 3.1. Autonomous Learning Ability

At present, the wide application of artificial intelligence in higher vocational education provides great help for students to realize self-exploration and personalized learning, because the application of artificial intelligence and big data platform can collect students' personalized information, analyze their interest orientation and evaluate their learning characteristics, thus accurately and efficiently recommending online learning resources. Artificial intelligence can not only be used to dynamically track the learning process, manage and supervise, answer questions and solve puzzles, and enhance the interest and confidence of college students in learning on the basis of improving the learning effect<sup>[2]</sup>, but also can be used for learning evaluation. It can provide diversified and multi-channel evaluation feedback to each learner through intelligent algorithms and intelligent models, and also provides various models and channels for the evaluation of college students' autonomous learning effect<sup>[3]</sup>.

Artificial intelligence not only provides impetus for students' self-learning and lifelong learning, but also puts forward new requirements for students. At present, artificial intelligence has achieved significant technological innovations and breakthroughs in various industries, which are also constantly updating the requirements for practitioners' professional ability and comprehensive quality. Facing the ever-changing development of information technology, students in

higher vocational colleges should strengthen the cultivation of autonomous learning ability, keep a high degree of concern and curiosity about artificial intelligence and computer technology, absorb the knowledge of computers and artificial intelligence through various channels, understand the latest and most advanced industrial applications, and explore new knowledge in professional fields and related computer knowledge, so as to continuously improve their professional ability, adapt to the future work requirements and new models, and adapt to the development of artificial intelligence era.

#### 3.2. Innovation Ability

High-tech such as artificial intelligence, from the initial development of high-end research in scientific research and education to the current, has developed many areas of practical application. It is predicted that in 2025, the world market scale of artificial intelligence technology and its radiation products will exceed 6 trillion US dollars for the first time, which will become an important highland for promoting global science and technology and economy, including different application scenarios such as intelligent recommendation of products in e-commerce, automatic face recognition in safety management system, unmanned automatic driving in transportation field, etc. arousing the social concern. The rise of new industries and new technologies makes traditional industries also face the needs of technological upgrading and reform. The employment structure adjustment promoted by the intelligent upgrading of industrial structure and the large demand for innovative talents in the market pose new challenges to the talent cultivation in colleges and universities<sup>[4]</sup>. General application-oriented talents are already hard to adapt to the development of the times, while creative talents with comprehensive quality and strong learning ability are showing their advantages in the fierce competition. Therefore, college students should adapt to the needs of the times of "informatization+intelligence", make comprehensive use of discipline resources, space resources, platform resources and policy advantages, constantly update their knowledge structure and expand their knowledge, so as to meet the multi-level needs of innovative talents in economic development and transformation, and realize knowledge innovation, technological innovation and personal development.

#### 3.3. Practical Ability

It was an important part and characteristic of the higher professional education to focus on the practical ability. In the practice and training activities of many professional courses, students need to use the basic knowledge and professional skills to solve practical problems and cultivate the post ability to deal with specific problems in the workplace work situation, which also helps to motivate students to master the professional knowledge, and constantly carry out independent improvement and innovation, and cultivate their innovation and entrepreneurial ability. However, the

practical teaching of many majors is more or less confronted with the following difficulties:

1. Because of the high technical specifications and professional requirements of training, it is very dangerous for students to run and operate on real training equipment.

2. Due to the high price of equipment in some industries, the current actual combat teaching conditions in the school cannot meet the needs of the production process in the industry;

3. Because the production process and situation of the enterprise cannot be displayed in the training base on campus, it is even more impossible to reproduce the typical accident handling operation in the production operation process.

In order to solve the above problems, artificial intelligence technology has been widely used in practical training courses. Many schools began to build virtual simulation laboratories, and applied virtual reality, 3D animation and image recognition technology to curriculum practice, so as to simulate the occurrence and processing of training scenes in 3D virtual scenes by combining artificial intelligence algorithm. In this way, by creating an artificial intelligence virtual simulation teaching and research system that meets the needs of the industry scene, the difficulty that students cannot visit the industry scene or have security risks in actual operation in the past is overcome, so that students can enter the virtual environment to interact and operate through various virtual devices and experience a real, interactive and immersive training process, which improves the efficiency and interest of training, promotes students to convert book knowledge into practical skills, and plays a huge role in improving students' practical operation ability and professional quality.

#### **4. Artificial Intelligence Providing New Measures for Computer Public Course Reform**

##### **4.1. Integrating Artificial Intelligence Knowledge into the Contents of Computer Public Courses**

Accurate matching with the development needs of social industries is a major feature of higher vocational talents training. The industrial revolution with artificial intelligence as the core technology puts forward new requirements for higher vocational talents training, and also provides new measures for higher vocational education reform. Some scholars, such as Li Baishan, believed that higher education in China should continue to pay close attention to the influence of artificial intelligence on the construction and development of disciplines, and promote the formation of a benign interactive mechanism between artificial intelligence-oriented personnel training and discipline development<sup>[5]</sup>. Computer public courses in higher vocational colleges need new models and new contents, and artificial intelligence should not only be the exclusive discipline of computer majors, but should be broadened in its education so that more students can learn artificial intelligence knowledge.

Therefore, the contents of public computer course in higher vocational colleges should be reformed and innovated by selecting artificial intelligence knowledge suitable for non-computer majors, constructing public computer knowledge framework based on artificial intelligence, revising course standards and training objectives, building new teaching resources of public computer course, and improving the ability and level of computer basic education.

##### **4.2. Constructing a Modular Curriculum System**

Based on the reality of diversified majors and diversified needs in higher vocational colleges, the traditional teaching mode should be changed when reforming the computer public course system, and the corresponding modular courses should be constructed for students to choose, so as to teach students in accordance with their aptitude and needs to fully stimulate each student's potential.<sup>[6]</sup>

In the construction of the new curriculum system, the application cases of artificial intelligence industry and computer profession can be transformed into curriculum projects and practical training resources, and the knowledge points corresponding to the ability points can be summarized by analyzing the ability requirements of different professional related occupational post groups, which can be designed into multiple modules, multiple learning tasks and work projects. The curriculum system should include general knowledge part, which corresponds to basic and general knowledge, and living module part, which is the knowledge and skills designed for specific positions. Different majors are combined in modular loose-leaf form according to their needs to meet the diversity of learning needs of students of different majors, organically integrate vocational skills with public computer education, and promote the development and application of artificial intelligence technology in different fields of society.

##### **4.3. Upgrading the Training Platform of Computer Courses**

To realize the deep integration of artificial intelligence technology and computer education, it is necessary to integrate the actual needs of industry development and teaching application from the significance and characteristics of vocational education, explore the discipline construction of deep integration, enrich the teaching content and innovate the practical training experience. According to the teaching needs and course contents, the original training platform of computer courses should be upgraded, and the training platform and teaching resources matched with the new curriculum system should be built to improve students' interest in learning and practical ability. Combined with the general knowledge points of artificial intelligence, AI+ intelligent production-education integration training platform should be built and matched with artificial intelligence course experiments to provide a learning environment for project-based programming, so that students can build their own artificial intelligence projects and improve and

train their artificial intelligence skills in an all-round way, which is conducive to strengthening the combination of basic computer education theory and training, and realizing the optimization of teaching effect.

## 5. Conclusions

In conclusion, as artificial intelligence is one of the core contents of the seven national new infrastructure construction plans, the demand for talents around the artificial intelligence industry chain is leading college education into a new stage of characteristic development, and it also puts forward new requirements for computer education in colleges and universities. The application and popularization of artificial intelligence technology in college education and teaching will become an important issue affecting economic growth and industrial upgrading. Therefore, in order to actively respond to the relevant policies of the state and adapt to the development needs of science and technology and industries, the computer public education in higher vocational colleges should take the cultivation of students' comprehensive quality and computer application ability as the teaching orientation, actively explore the organic integration of artificial intelligence knowledge and computer public course content, build a diversified and modular new curriculum system, and build a computer general course training platform based on artificial intelligence projects, thus contributing to the training of "artificial intelligence

+X" compound professionals and professional construction and development.

## Acknowledgement

This paper was financially supported by Teaching Reform Program of Public Computer Courses in Guangdong Universities "Teaching Content and Model Reform of Public Computer Course Based on Artificial Intelligence Technology" (2021-GGJSJ-026)

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