Design of Teaching System for Interdisciplinary Artificial Intelligence Course Cluster under the Concept of New Engineering Education

Feng Wang[1] Shaojiang Liu[2] Zhiming Xu[3]

[1,2,3] *Guangzhou Xinhua University, Dongguan, Guangdong, China*
[2]*Email: mrliuxinhua@xhsysu.edu.cn*
[3]*Email: xujay@xhsysu.edu.cn*
[1]*Corresponding author. Email: iswf@xhsysu.edu.cn*

ABSTRACT

The educational concept of new engineering has penetrated into all kinds of professions, especially in the process of the development of such educational concepts, promoting the reform of the educational concepts of various professions, such as new business, new liberal arts, etc. Then, at the same time of the development of significant results, reviewing and sorting out the focus of reform in the construction of professions, it is not difficult to see that, based on the development of the current artificial intelligence hot, in the non-artificial intelligence professions, how to be able to better Utilize the knowledge and technology of artificial intelligence to integrate into the construction of interdisciplinary. In the direction of such specialties as electronic information, the knowledge of artificial intelligence into the professional construction of the course group, to cross-disciplinary development to establish the artificial intelligence course group in line with the characteristics of its specialty, the establishment of the teaching system of artificial intelligence course group, the design of a complete curriculum program is the focus of its continued deepening of the reform for the cultivation of new generation of high-quality and highly skilled applied talents specialized in engineering.

Keywords: Electronic information, Artificial intelligence, Engineering Education, Application-oriented talents, Intelligent manufacturing.

1. INTRODUCTION

In 2017, a seminar on the development strategy of engineering education in comprehensive colleges and universities was held at Fudan University, which reached the consensus of Fudan University on the construction of "new engineering disciplines". The Ministry of Education has actively promoted the construction of new engineering disciplines, and has successively formed the "Fudan Consensus", "TIU Action" and "Beijing Guidelines", and issued the "Notice on the Research and Practice of New Engineering Disciplines" and the "Notice on the Promotion of the Research and Practice Program of New Engineering Disciplines". The concept of "New Engineering" has become an important topic of discussion in colleges and universities, with the release of the "Notice on the Research and Practice of New Engineering" and the "Notice on the Promotion of New Engineering Research and Practice Program", and the launching of the "New Engineering Research and Practice" program. The main idea of "New Engineering" talent cultivation is to advance the cultivation of interdisciplinary and cross-disciplinary composite innovative and entrepreneurial talents in the new round of science and technology and industrial revolution, to solve the huge gap of talents for future industrial development, and to upgrade the knowledge structure and cultivation system of traditional disciplines. Focusing on the construction of new engineering majors, the Ministry of Education has not only approved new engineering majors such as big data, artificial intelligence, cyberspace security, etc., but also provided new ways to introduce new technologies into the construction of traditional engineering majors through the project of Industry-University-Research

Collaborative Educational Program, which promotes the transformation of traditional engineering majors into new engineering majors [1]. The development of new engineering has also promoted the construction of new majors, and since the release of the development plan of artificial intelligence colleges and universities in 2018, there has been a blowout pattern of new artificial intelligence and other majors every year, which also shows that the educational reform of new engineering is deep in colleges and universities, and in the future, the new engineering has made the new majors flourish, and has also allowed the disciplines to carry out cross-development. Under the continuous construction of new majors represented by artificial intelligence in full swing, it affects the reconstruction and development of traditional disciplines, and even affects the educational reform of business and liberal arts and other disciplines.

The development of new engineering is a systematic project, targeting the technological update and change of engineering technology classes, in fact, not only boosting the establishment of new professions, such as smart manufacturing, big data and other professions more or less have the influence of artificial intelligence. The development of traditional disciplines has gradually moved towards the development of the road with the combination of artificial intelligence technology, the arrival of interdisciplinary cross, so that all the professions rejuvenated, making the traditional disciplines have also entered the fast lane mode, faster than ever for the industry's transformation, which is also a good opportunity to go through the opportunity to deepen the field of specialization in the field of the new model of the new development, and use this as a driving force to accelerate the high-end application-oriented innovative technology The training of specialists, so that the talents have a truly comprehensive literacy and quality, especially in technology with cross-disciplinary attributes above the ability. Nowadays, no matter what disciplines, new technology will be used to promote the reform of the discipline, through the interdisciplinary cross-disciplinary way to give the discipline a new vitality, the traditional disciplines of the knowledge system is very perfect, the cultivation of people has accumulated a long time of experience, how to further deepen the reform of education, which needs to be a large-scale new technology references as an opportunity to the new technologies and new methods to be applied to the traditional disciplines, then to the

Artificial Intelligence as a representative of the technology trend affects all aspects of life, is bound to also bring changes to the traditional disciplines, in such a context, with the concept of new engineering education in the non-Artificial Intelligence majors on the construction of Artificial Intelligence and professional intersection of the course group, the integration of Artificial Intelligence in line with the professional development of the teaching system, the design of Artificial Intelligence in the profession of the course content, to be compounded in the characteristics of the specialty, with a view to achieving a new professional construction height.

2. DIFFICULTIES IN INTEGRATING NON-AI MAJORS INTO AI COURSE CLUSTERS

To integrate AI course clusters inside non-AI disciplines is a difficult teaching reform, especially based on the original disciplinary settings and talent training programs, in fact, the integration of AI course clusters is also to better enhance the construction of the profession, to carry out in-depth educational reforms of the traditional engineering majors, and to revitalize the new vitality, and the difficulties should be analyzed first, and then based on the difficulties of figuring out the revision of the talent training program.

2.1 Difficulties of the Electronic Information Construction Course Cluster

In the construction of artificial intelligence course group in electronic information, the first thing is to face the problem of updating the knowledge of teachers, many teachers from electronic information, the original traditional knowledge mastery is very thorough, but there is still a certain degree of difficulty in the learning of artificial intelligence this hot direction. Artificial intelligence professional into the electronic information category, in fact, contains a broader surface, adapt to more disciplines, that will inevitably force professional teachers have to understand and learn the relevant knowledge of the artificial intelligence system. Teachers of electronic information are relatively weak in algorithms and programming, so they should focus on strengthening this aspect of learning, and should consider the combination of hard and soft and algorithmic scenarios in the courses, and introduce project teaching.

2.2 Artificial Intelligence Courses Will Squeeze the Original Specialized Courses

If some people want to revise the talent training program, then they have to increase the number of courses, but in the case of the total number of courses and the number of hours remains unchanged, it is inevitable to reduce the original professional courses. If the artificial intelligence courses increase more, then the professional courses will be reduced more, if the increase is not much, can play a limited role in the revision of the training program has to carefully consider this issue, definitely not a simple increase or decrease this way to calculate, to take a more scientific approach to the revision of the training program.

2.3 Poor Engineering Practice in Course Clusters Integrated with AI

The establishment of artificial intelligence course clusters in electronic information majors through interdisciplinary is itself limited by resources. Artificial intelligence knowledge system and knowledge application in the continuous rapid development, transmission will have a certain lag, at the same time, the knowledge application in the industry is changing day by day, the timeliness of the transformation into teaching resources is not enough, resulting in the practical teaching and the industry to produce a compartment [2]. The curriculum will also bring the problem of teaching quality, especially the engineering practice ability is not strong, the professional courses to be combined with artificial intelligence technology, bringing new applications and knowledge systems, if not strengthen the practical training, so that the teaching results are not ideal.

3. MULTIPLE INITIATIVES TO IMPROVE THE QUALITY OF TEACHING IN ARTIFICIAL INTELLIGENCE COURSE CLUSTERS

The purpose of modifying the talent training program is to improve the overall quality of teaching, enhance the employment competitiveness of college students, enhance the innovation and entrepreneurship of college students, and cultivate composite and applied talents with strong technical skills, then it is necessary to take a variety of initiatives to implement the teaching reform, start

from the fundamental problem of solving the problem of integrating into the artificial intelligence course group, explore the solution of the existence of the engineering practice problems, and build a system of electronic information to cultivate excellent talents by deepening the reform.

3.1 Establishment of Artificial Intelligence Curriculum Clusters Under the New Engineering Program

Through inter-professional construction, the connotation and extension of the emerging technology of artificial intelligence can be used to integrate with traditional engineering majors [3]. To integrate artificial intelligence knowledge and technology, the first step is to analyze the professional curriculum, to study the professional curriculum project inside the degree of fit with artificial intelligence, or to study whether the professional curriculum can be updated to apply the knowledge points of artificial intelligence, not just increase the artificial intelligence-related courses, to be able to transform the existing professional curriculum, according to the application of artificial intelligence technology, in the form of a project integrated into the curriculum, to be able to reflect the specific application of its practice teaching In the hardware and software curriculum, you can appropriately change the name, you can modify the syllabus and other methods, so that the technology and knowledge system of artificial intelligence is applied in the discipline. For example: Python language programming can increase the content renamed Python data analysis and machine learning, etc. Of course, it is also necessary to increase the study of artificial intelligence theory to carry out in an introductory way, but also for example: in the data structure course to add the knowledge of artificial algorithms. There is also the application of artificial intelligence technology in the robotics course.

3.2 Developing Excellent Interdisciplinary Teachers

To cultivate a group of excellent teachers who understand both electronic information professional knowledge and artificial intelligence technology, we can cultivate a group of backbone technical teachers, so that teachers of different disciplines and specialties can strengthen exchanges, set up a teaching and research group of electronic information and artificial intelligence, and gather excellent teachers for exchanges and learning, and

we can also allow teachers of different specialties to cross-teach, so that the overall level of the teachers can be improved through continuous mutual learning, so that it is important in the process of curriculum reform. The process of curriculum reform is of great significance, and it is necessary to hold regular curriculum seminars, and even through exchanges and learning with other schools to accumulate cross-knowledge integration. Teachers can also apply for the application of artificial intelligence as the application of scientific research projects, the enhancement of scientific research projects, driven by the reform of teaching, scientific research projects with advanced technology and knowledge of the concept into the teaching of the curriculum to increase the proportion of practice, to strengthen the proportion of practical teaching, to strengthen the development of the project of the practical courses, to avoid teaching the theoretical process of weakening the motivation of students to learn. For example: digital image processing courses can be deep learning algorithms for classification and detection project teaching, can detect fruits and other food, to stimulate students' interest in learning. In terms of teacher and talent development, full consideration can be given to large enterprises in the field of artificial intelligence mentioned above cooperate and connect with the industry [4].

3.3 Promoting the Construction of Course Clusters Oriented by Artificial Intelligence Application Discipline Competitions

Focus on organizing a class of academic competitions related to artificial intelligence, encourage students to participate in disciplinary competitions to artificial intelligence selected topics as a guide, so that students start from the artificial intelligence algorithms to develop related hardware and software works, to race to promote learning is a very good way of the norm, and provide students with a variety of types of algorithms, to learn the knowledge of artificial intelligence to be integrated into the R & D. Such as: the Challenge Cup, " Internet +" and other open-ended propositions to complete the work based on artificial intelligence technology, as well as artificial intelligence-based IT competitions. Such as: robotics and artificial intelligence competition is a very good combination of hardware and artificial intelligence technology, this event is very suitable for electronic information students to participate in, but also just the curriculum teaching into the competition. Around

the development of various competitions, it is very natural to combine the discipline with the artificial intelligence course group, after class guidance for students to follow the latest technological development direction and learn the latest technologies[5], through this cross-disciplinary and interdisciplinary integration, not only to improve the quality of teaching, but also to improve the overall quality of the discipline construction, and inject vitality into the development of the development of electronic information majors.

3.4 Cooperating with Enterprises to Strengthen the Engineering Practice Education of Artificial Intelligence Technology

In the face of the weak link of engineering practice of artificial intelligence course group, especially are biased towards theoretical algorithms and knowledge structure system, so that non-artificial intelligence students learn very hard, but it is impossible to learn from the beginning, it is impossible to follow the professional curriculum system of artificial intelligence, and the professional curriculum system of artificial intelligence is more difficult, and there is a great deal of difficulty for the construction of disciplines of applied colleges and universities, and from this level, the Engineering practice education is inevitably weak. In fact, the purpose of establishing a group of artificial intelligence courses is to carry out professional re-construction and re-reform across disciplines, and to arm the traditional profession with new technology and new knowledge, not to throw away the advantages of traditional disciplines. To enhance the quality of engineering practice education there is a good way is to deep cooperation with enterprises, on the basis of the original industrial colleges, the development of project teaching in line with the discipline, for the upper grades to the enterprise practice project as the leading, such as: in the electronic information to open a professional innovation and entrepreneurship training courses, the purpose is to integrate artificial intelligence technology from the hardware practice project, such as the use of Raspberry Pi development of intelligent detection system For example, the development of intelligent detection system using Raspberry Pi is a good project to apply mature modeling algorithms to the hardware system. Create an innovative atmosphere that stimulates vitality[6].

4. CONCLUSION

With the rapid iterative development of artificial intelligence technology, how to ensure that the artificial intelligence course group can always play an important role, we need to take a variety of measures, from the curriculum into the knowledge point, revise the talent training program, training excellent interdisciplinary teachers. The quality of the content of the courses should be improved by regularizing the teaching reform meetings, and the courses should also be cooperated with enterprises and relying on industrial colleges to improve the overall quality of practical teaching and apply for exemplary industry-academia-research bases at the provincial level or above. In the context of the new engineering discipline, it is necessary to not only continue the deep reform and improvement of the original disciplines, but also conform to the times, apply new technologies and new methods to the disciplinary programs, be able to quickly transform teaching resources, lead the application of new technologies through academic competitions, and improve the teaching quality of disciplines through academic programs, so as to truly help the development of the new engineering specialty.

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